

UNIVERSITY CATALOG

2020-2021



University Calendar Fall 2020

2020						
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Fall 2020	
August	20 Residence halls open - 7:00 a.m.
	24 First day of classes; Late registration and add/drop periods begin
	25 Only for courses meeting first half of the semester - last day to add, change sections, or change grading options
	27 Last day to add, change sections, or change grading options semester courses - <i>strictly enforced</i>
	27 Only for courses meeting first half of the semester - last day to drop
September	1 Tuition/Fees due in full, or first payment installment due if in payment plan (see page 28)
	2 Last day to drop semester courses - <i>strictly enforced</i>
	2 Last day to make changes to health insurance selection
	7 Labor Day (offices closed)
	30 Only for courses meeting first half of the semester - last day to withdraw
October	15 Midsemester
	16 Midsemester Break - classes excused
	20 Only for courses meeting second half of the semester - last day to add, change sections, or change grading options
	21 Midsemester grades must be loaded online (by noon)
	22 Only for courses meeting second half of the semester - last day to drop
	26 Advising Period for Spring 2021 begins
	28 Registration for Spring 2021 begins for continuing students
November	6 Last day to withdraw from individual semester courses
	23-27 Thanksgiving Break - classes excused
December	3 Only for courses meeting second half of the semester - last day to withdraw
	3 Last day to work with Dean of Students office to leave all UW classes in Fall 2020 and receive a grade of "W" for each class
	7 Registration for Spring 2021 for new or re-enrolling students begins
	11 Last day of classes
	12 Commencement
	14-18 Finals Week
	19 Residence halls close - 12:00 p.m.

Notes:

- (1) Refer to the *Class Schedule* for information on registration.
- (2) Subject to change on not less than 30 days' notice unless an actual emergency arises, in which event the administration may exercise its option to make any change without notice.

University Calendar Spring 2021

2021							Spring 2021						
							January	18	Martin Luther King Jr./Wyoming Equality Day (offices closed)				
								15	Residence halls open - 7:00 a.m.				
								19	First day of classes; late registration and drop/add periods begin				
								20	Only for course meeting first half of the semester - Last day to add, change sections, or change grading options				
								22	Last day to add, change sections, or change grading options in semester courses - <i>strictly enforced</i>				
								22	Only for course meeting first half of the semester - Last day to drop				
								28	Last day to drop semester courses - <i>strictly enforced</i>				
								28	Last day to make changes to health insurance selection				
							February	1	Tuition/Fees due in full, or first payment installment due if in payment plan (see page 28)				
									Only for courses meeting first half of the semester - Last day to withdraw				
							March	1	Registration for Summer 2021 courses begins				
								10	Midsemester				
								15-19	Spring break				
								23	Only for courses meeting second half of the semester - Last day to add, change sections, or change grading options				
								23	Midterm grades must be submitted online by noon				
								25	Only for courses meeting second half of the semester - Last day to drop				
								29	Advising period for Fall 2021 begins				
								31	Priority registration for Fall 2021 begins				
							April		Last day to withdraw from individual semester courses				
									Only for courses meeting second half of the semester - Last day to withdraw				
									Last day to work with Dean of Student office to leave all UW classes in Spring 2021 and receive a grade of "W" for each class				
							May	7	Last day of classes				
								10-14	Finals Week				
								15	Commencement				
								15	Residence halls close - 12:00 p.m.				
								20	Final grades must be submitted online by noon				
							Notes:						
								(1)	Refer to the <i>Class Schedule</i> for information on registration.				
								(2)	Subject to change on not less than 30 days' notice unless an actual emergency arises, in which event the administration may exercise its option to make any change without notice.				
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University Catalogs Available

University Catalog—Online only

Law School Bulletin—College of Law, Dept. 3035—(307) 766-6416

Summer Bulletin—Online only

(All addresses: 1000 E. University Avenue, Laramie, WY 82071)

University of Wyoming website: www.uwyo.edu

The University of Wyoming is built upon a strong foundation of integrity, respect and trust. All members of the university community have a responsibility to be honest and the right to expect honesty from others. Any form of academic dishonesty is unacceptable to our community and will not be tolerated.

The University of Wyoming is an affirmative action/equal opportunity employer and institution and does not discriminate on the basis of race, sex, creed, color, age, national origin, individual handicap, or veteran status in any aspect of employment or services. The institution's educational programs, activities, and services offered to students and/or employees are administered on a nondiscriminatory basis subject to the provisions of all civil rights laws and statutes. Evidence of practices that are not consistent with this policy should be reported to the Employment Practices Officer, 766-3459.

Administration

The Trustees of the University of Wyoming

Officers

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John McKinley	Vice Chairman
Michelle Sullivan	Secretary
Kermit Brown	Treasurer

Members

Term		Year Expires
<i>Appointed/Reappointed</i>		
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2015	John McKinley, Cheyenne	2021
2015	Michelle Sullivan, Sheridan	2021
2017	Kermit Brown, Laramie	2023
2015	Mel Baldwin, Afton	2021
2019	Brad Bonner, Cody	2025
2017	David Fall, Gillette	2023
2018	Laura Schmid-Pizzatto, Rock Springs	2023
2017/2019	Macey Moore, Douglas	2025
2015	Dick Scarlett, Jackson	2021
2013/2019	Dave True, Casper	2023
2020	Brad LaCroix, Newcastle	2026

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Edward Seidel, Acting President of the University of Wyoming
Riley Talamantes, President of the Associated Students of the University of Wyoming
Jillian Balow, State Superintendent of Public Instruction
Sandra Caldwell, Executive Director, Wyoming Community College Commission

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Tara Evans	General Counsel
Emily Monago	Chief Diversity Officer
Vacant	Interim Vice President for Community Affairs

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Jim Ahern	Associate Vice Provost of Graduate Education, Academic Affairs

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Vacant	Associate Vice Provost for Global Engagement
Ryan O'Neil	Dean of Students

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Pilar Flores	Director, Student Educational Opportunity
Debra Hintz	Director, Scholarships and Financial Aid
Amanda Reeder	Director, Transfer Relations

Student Affairs:

Keener Fry	Executive Director, Alumni Relations
Pat Moran	Director, Campus Recreation
Eric Webb	Executive Director of Residence Life, Dining Services, and the Wyoming Union
Vacant	Director, Student Health Services
Toi Geil	Director, University Counseling Center
Jeremy Davis	Director, Center for Student Involvement and Leadership

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Kelly Crane	Associate Dean and Director, UW Extension
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Benjamin Rashford	Head, Agricultural and Applied Economics
Bledar Bisha	Interim Head, Animal Science
Christine Wade	Head, Family and Consumer Sciences
Gerard Andrews	Director, Microbiology Program
Peter Thorsness	Head, Molecular Biology
Andrew Kniss	Head, Plant Sciences
Scott Miller	Head, Ecosystem Science and Management
William Laegreid	Head, Veterinary Sciences and Director, Wyoming State Veterinary Laboratory

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Ricki Klages	Head, Visual and Literary Art
Naomi Ward	Head, Botany
Debashis Dutta	Head, Chemistry
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Kelly Kinney	Head, English
Mark Clementz	Head, Geology and Geophysics

Isadora Helfgott Head, History and American Studies
 Jonathan Prather Director, Life Sciences Program
 Jason Williford Head, Mathematics and Statistics
 Joy Landeira Head, Modern and Classical Languages
 J. Scott Turpen Head, Music
 Susanna Goodin Head, Philosophy and Religious Studies
 Jinke Tang Head, Physics and Astronomy
 Stephanie Anderson Director, School of Politics, Public Affairs,
 and International Studies
 Sean McCrea Head, Psychology
 Margaret Wilson Head, Theatre and Dance
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 Steven Russell Assistant Dean
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 David Aadland Chair, Economics
 Ronn Smith Chair, Management and Marketing
 Nicole Choi Director, Finance Program
 Klaas van't Veld Director, Economics Graduate Programs
 Ben Cook Director, MBA Program
 Stephanie Oneto Director, Marketing Ph.D. Program
 Eric Johnson Director, MS Accounting Program

Leslie S. Rush Interim Dean, College of Education

Alan Buss Director, School of Teacher Education
 Peter Moran Director, School of Counseling, Leadership,
 Advocacy & Design
 Margaret Hudson Principal, UW Lab School
 Leslie Rush and Suzanne Young Co-Directors, Wyoming School/
 University Partnership

**Cameron Wright Interim Dean, College of Engineering
 and Applied Science**

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 Paul Dellenback Associate Dean
 Bart Geerts Head, Atmospheric Science
 Vladimir Alvarado Head, Chemical Engineering
 Brian Toelle Interim Head, Petroleum Engineering
 Anthony Denzer Head, Civil and Architectural Engineering
 James Caldwell Head, Computer Science
 John McInroy Head, Electrical and Computer Engineering
 Carl Frick Head, Mechanical Engineering

David Jones Dean, College of Health Sciences

Tristan Wallhead Associate Dean
 Michelle L. Hilaire Associate Dean
 Sherrill J. Smith Dean, Fay W. Whitney School of Nursing
 Kem Krueger Dean, School of Pharmacy
 Mark Guiberson Director, Division of Communication Disorders
 Derek Smith Director, Division of Kinesiology and Health
 Eleanor Pepi Downey Director, Division of Social Work
 Timothy Robinson Director, WWAMI Medical Education
 Brian Veauthier Director, UW Family Medicine Residency
 Program at Casper
 Evan Norby Director, UW Family Medicine Residency
 Program at Cheyenne
 Sandy Root-Elledge Executive Director, Wyoming
 Institute for Disabilities (WIND)
 Craig Vaske and April French Advisors, Pre-Health and Pre-Admit
 Dental Hygiene

Klint Alexander Dean, College of Law

Sam Kalen Associate Dean

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Brent Pickett Dean, UW-Casper

Ivan Gaetz Dean, University Libraries

**Doug Wachob Interim Dean, Haub School of Environment
 and Natural Resources**

Holly Krutka Executive Director, School of Energy Resources

Sam Shearer, Lt. Col. Head, U.S. Air Force ROTC
 Thomas Haas, Lt. Col. Head, U.S. Army ROTC
 Peter Parolin Dean, Honors College
 Janel Seeley Director, John P. Ellbogen Center for
 Teaching and Learning
 Steven Carpenter Director, Institute for Energy Research and
 Director, Enhanced Oil Recovery Institute
 Paul Flesher Director, American Heritage Center
 Marianne Wardle Director, Art Museum

For a complete list of all faculty and staff and their contact information, please see the *UW Campus Directory* or the UW Web site at www.unyo.edu.

Mission Statement

We honor our heritage as the state's flagship and land-grant university by providing accessible and affordable higher education of the highest quality; rigorous scholarship; the communication and application of knowledge; economic and community development; and responsible stewardship of our cultural, historical and natural resources.

In the exercise of our primary mission to promote learning, we seek to provide academic and co-curricular opportunities that will:

- Graduate students who have experienced the frontiers of scholarship and creative activity and who are prepared for the complexities of an interdependent world;
- Cultivate a community of learning energized by collaborative work among students, faculty, staff and external partners;

- Nurture an environment that values and manifests diversity, internationalization, free expression, academic freedom, personal integrity and mutual respect; and

- Promote opportunities for personal health and growth, physical health, athletic competition and leadership development for all members of the university community.

As Wyoming's only public university, we are committed to scholarship, outreach and service that extend our human talent and technological capacity to serve the people in our communities, our state, the nation and the world.

University of Wyoming Non-Discrimination Statement

The University is committed to equal opportunity for all persons in all facets of the University's operations and is an Equal Opportunity/Affirmative Action Employer. The University will provide all applications for admissions, employment and all University employees with equal opportunity without regard to race, gender, religion, color, national origin, disability, age, protected veteran status, sexual orientation, gender identity, genetic information, creed, ancestry, political belief, or any other applicable protected category or participation in any protected activity. The University ensures non-discriminatory practices in all matters relating to its education programs and activities and extends the same non-discriminatory practices to recruiting, hiring, training, compensation, benefits, promotions, demotions, transfers, and all other terms and conditions of employment.

The University is also committed to complying with all of the rules, regulations, and relevant orders of the Secretary of Labor and the Office of Federal Contract Compliance Programs (OFCCP), issued pursuant to Executive Order 11246, the Vietnam Era Veterans' Readjustment Assistance Act, and Section 503 of the Rehabilitation Act of 1973, and has an audit and reporting system to facilitate compliance.

It is the continuing, active, individual responsibility of each principal Administrative Officer, Dean, Department and Division Head or Supervisor to assure that the University's Equal Employment Opportunity policy is followed when making decisions related to recruiting, hiring, training or promoting qualified persons.

For more information please see UW Regulation 1-3 (Equal Education and Equal Employment Opportunity Statement and Policy/Diversity Program).

University Communication Statement

The University of Wyoming assigned email account shall be one of the official means of communication with all students, faculty, and staff. All community members are responsible for all information sent to them via their University assigned email account. Members who choose to manually forward mail from their University email accounts are responsible for ensuring that all information, including attachments, is transmitted in its entirety to the preferred account.

All faculty, staff, and students are required to maintain an @uwyo.edu computer account. This account provides both an online identification key and a University official email address. The University sends much of its correspondence solely through email. This includes,

but is not limited to, policy announcements, student account billing notifications, emergency notices, meeting and event notifications, course syllabi and requirements, and correspondence between faculty, staff, and students. Such correspondence is mailed only to the University official email address.

Faculty, staff, and students are expected to check their email on a frequent and consistent basis in order to stay current with University-related communications.

Faculty, staff, and students have the responsibility to recognize that certain communications may be time-critical.

University Accreditation/Membership

The University of Wyoming, and all UW academic programs are accredited by The Higher Learning Commission, a commission of the North Central Association of Colleges and Schools Commission on Institutions of Higher Education, 230 South LaSalle Street, Suite 7-500, Chicago, IL 60604 or (800) 621-7440.

In addition, many individual academic programs are either approved, accredited or hold membership as indicated below.

Recognized or accredited by:

- ABET (formerly known as Accreditation Board for Engineering and Technology)
- Accreditation Association for Ambulatory Health Care, Inc.
- Accreditation Council for Education in Nutrition and Dietetics (ACEND) of the Academy of Nutrition and Dietetics
- Accreditation Council for Graduate Medical Education
- Accreditation Council for Pharmacy Education
- American Alliance of Museums
- American Association of Professional Landman
- American Association of Vet Lab Diagnosticians
- American Bar Association
- American Chemical Society
- American Dental Association
- American Psychological Association
- Association of American Law Schools
- Association to Advance Collegiate Schools of Business (AACSB)
- Council for Accreditation of Educator Preparation
- Commission on Collegiate Nursing Education
- Computer Science Accreditation Commission (a participating body of ABET)
- Council for Accreditation of Counseling and Related Educational Programs
- Council on Academic Accreditation in Audiology and Speech Language Pathology
- Council on Social Work Education
- International Association of Management Education

- National Association of Schools of Music
- National Association for Sport & Physical Education - Accreditation
- National Council for Accreditation of Teacher Education
- National Council on Family Relations
- Society for Range Management
- Specialized Professional Association-Licensure K12 Physical Education
- Wyoming Professional Teaching Standards Board

Holds membership in:

- American Association of Colleges of Teacher Education
- American Association of University Women
- American Council on Education
- American Society for Engineering Education
- Association for the Advancement of International Education
- Association of Academic Survey Research Organizations
- Association of American Colleges and Universities
- Council for the Advancement and Support of Education
- Council of Academic Deans from Research Education Institutions
- Council of Colleges of Arts and Sciences
- Council of Graduate Schools
- Justice Research and Statistics Association
- Greater Western Library Alliance
- Associate of Public and Land Grant Universities
- National Network for Educational Renewal
- University Professional and Continuing Education Association
- Western Association of Graduate Schools
- Western Cooperative for Educational Technology
- Western Interstate Commission for Higher Education

Assessment of Student Learning at the University of Wyoming

The University of Wyoming is committed to providing students with high quality academic programs and services. As a result, UW is actively engaged in several processes to assess student learning with the ultimate goal of continuous improvement. A university wide assessment plan and individual department plans are in various stages of implementation. The purpose of these plans is to identify and articulate student learning outcomes – the skills, abilities, and knowledge that students are expected to acquire by the completion of their programs – and the means by which these outcomes would be measured. Learning is assessed at the university, college and departmental levels. Current assessment activities include, but are not limited to, surveys, interviews,

portfolios, exams and senior capstone projects. In order for UW's assessment efforts to be successful, students must become engaged in the process. As such, students are expected and/or required to complete various assessments as determined by the university or department prior to the awarding of degrees.

For more information regarding the student learning outcomes for a particular program of study, see the section on College and Division Programs. For further information about the University of Wyoming's assessment of student learning efforts, see the Assessment of Student Learning webpage at www.uwyo.edu/assessment.

FERPA

Family Educational Rights and Privacy Act (PL-380)

General Statement

The University of Wyoming has the responsibility for effectively supervising any access to and/or release of official data/information related to the education records of its students. Certain items of information about individual students are fundamental to the educational process and must be recorded. This recorded information concerning students must be used only for clearly-defined purposes, must be safeguarded and controlled to avoid violations of personal privacy, and must be appropriately disposed of when the justification for its collection and retention no longer exists.

In this regard, the university is committed to protecting, to the maximum extent possible, the right of privacy of all individuals about whom it holds information, records, and files. Access to, and release of, such records is restricted to the student concerned, to parents of dependent students, to others with the student's written consent, to officials within the university, to a court of competent jurisdiction, and otherwise pursuant to law.

Access

All official information collected and maintained in the university identifiable with an individual student will be made available for inspection and review at the written request of that student subject to certain exceptions.

For purposes of access to records at the University of Wyoming, students enrolled (or formerly enrolled) for academic credit or audit at the university shall have access to official records concerning themselves.

A request for general access to all official records, files, and data maintained by the university must be made in writing to the registrar or to other person(s) as designated by the university officer in charge of the unit maintaining records. A request for access to official data maintained in a particular office may be made to the administrative head of the office.

When students (or former students) appear at a given office and request access to the university record about themselves:

1. The student must provide proper identification verifying that he or she is the person whose record is being accessed.
2. The designated staff person(s) must supervise the review of the contents of the record with the student.
3. Inspection and review shall be permitted within a period not to exceed 45 days from the date of the student's request.
4. Students will be free to make notes concerning the contents, but no material will be removed from the record at the time.

Recordkeeping personnel and members of the faculty and staff with administrative assignment may have access to records and files for internal educational purposes as well as for routine necessary clerical, administrative, and statistical purposes as required by the duties of their jobs. The name and position of the official responsible for the maintenance of each type of education record may be obtained from the registrar of the university.

Any other access allowed by law must be recorded showing the legitimate educational or other purpose and the signature of the person gaining access. The student concerned shall be entitled to review this information.

Release of Information

No personally identifiable information shall be disclosed to any individual (including parents, spouse, or other students) or organization except as follows:

1. Disclosure is authorized in writing by the student.
2. Disclosure is to university officers or employees who need to know so as to accomplish legitimate university purposes related to their functions.
3. Disclosure is to a governmental agency, educational organization, parent of a dependent student, or other entity as described by federal regulations or otherwise required by state or federal law. Custodians of records should obtain interpretations whenever third parties request personally identifiable information.
4. To authorized educational authorities at the local, state, and federal level.
5. When disclosure of any personally identifiable data/information from university records about a student is demanded pursuant to court order or lawfully issued subpoena, the staff member receiving such order shall, if possible, immediately notify the student concerned in writing prior to compliance with such order or subpoena. (NOTE: In fulfillment of its responsibilities to monitor certain state benefit and entitlement programs, the Wyoming state auditor may issue to the university from time to time an administrative subpoena for a listing of currently enrolled full-time students, the students' social security numbers, and information relating to the nature and amount of any educational financial aid being received by such students. Upon being served with such a subpoena, the university will provide the information requested without further notice.)
6. Data/information from university records about students will be released for approved research purposes only if the identity of the student involved is fully protected, or if the research is related to official university business and not publicly disseminated.
7. Information from university records may be released to appropriate persons in connection with an emergency if the knowledge of such information is necessary to protect the health or safety of a student or other persons.

The university officer responsible for the records from which information is released shall maintain with the student's record a listing of disclosures of personally identifiable information, except disclosures in accordance with items 1 and 2 above for which no record need be kept. The listing shall identify the parties who requested or obtained information and the legitimate interests these parties had in making the request.

Public or Directory Information

The following items are considered public data/information and may be disclosed by the university in response to inquiries concerning individual students, whether the inquiries are in person, in writing, or over the telephone:

1. Name;
2. Affirmation of whether currently enrolled;
3. Campus location.

Unless students have officially filed a written request with the university registrar within ten working days after the first day of classes for a semester that disclosure not be made without their written permission, the following items, in addition to those above, are considered public/directory information; may be included in appropriate university/campus directories and publications; and may be disclosed by designated staff members in response to inquiries concerning individual students, whether the inquiries are in person, in writing, or over the telephone:

1. School, college, department, major, or division;
2. Dates of enrollment;
3. Degrees received;
4. Honors received;
5. Local address and phone number;
6. Home address (permanent);
7. Email address;
8. Participation in officially recognized activities and sports;
9. Weight and height of members of athletic teams;
10. Full-time or part-time enrollment.

Letters of Appraisal/Recommendation

Candid appraisals and evaluations of performance and potential are an essential part of the educational process. Clearly, the providing of such information to prospective employers, to other educational institutions, or to other legitimately concerned outside individuals and agencies is necessary and in the interest of the particular student.

Data/information which was part of university records prior to January 1, 1975 and which was collected and maintained as confidential information will not be disclosed to students. Should a student desire access to a confidential letter of appraisal received prior to January 1, 1975, the student shall be advised to have the writer of that appraisal notify, in writing, the concerned records custodian of the decision as to whether or not the writer is willing to have the appraisal made available for the student's review. Unless a written response is received approving a change of status in the letter, the treatment of the letter as a confidential document shall continue.

Documents of appraisal relating to students and collected by the university or any department or office of the university on or after January 1, 1975, will be maintained confidentially only if a waiver of the right of access has been executed by the student. In the absence of such a waiver, all such documents will be available for the student's inspection and review.

If a student files a written waiver with the department or office concerned, letters of appraisal received pursuant to that waiver will be maintained confidentially. Forms will be available for this purpose.

Challenges to the Record

All students shall have the opportunity to challenge any item in their file which they consider to be inaccurate, misleading, or otherwise inappropriate. A student shall initiate a challenge by submitting a request in writing for the deletion or correction of the particular item. The request shall be made to the custodian of the particular record in question.

If the custodian and the student involved are unable to resolve the matter to the satisfaction of both parties, the written request for deletion or correction shall be submitted by the student to such person as designated by the president of the university who shall serve as the hearing officer. The student shall be given the opportunity for a hearing at which the student may present oral or written justification for the request for deletion or correction. The hearing officer may obtain such other information as he or she deems appropriate for use in the hearing and shall give the student a written decision on the matter within 30 days from the conclusion of the hearing. If the decision of the hearing officer is to deny the deletion or correction of an item in the student's file, the student shall be entitled to submit a written statement presenting the student's position with regard to the item to the hearing officer. Both the written decision of the hearing officer and the statement submitted by the student shall be inserted in the student's file. The decision of the hearing officer shall be final.

Grades may be challenged under this procedure only on the basis of the accuracy of their transcription or posting.

Exception to the Policy

It is the position of the university that certain data/information maintained in various offices of the university is not subject to the provisions of this policy with regard to inspection, review, challenge, correction, or deletion. Exceptions to "education records" include: alumni records, employment records, law enforcement records, medical records, sole possession records, and university disciplinary records.

1. Statements submitted by parent(s)/guardian or spouse in support of financial aid or residency determinations are considered to be confidential between those persons and the university and are not subject to the provisions of this policy except with the written consent of the persons involved. Such documents are not regarded as part of the student's official record.
2. University employment records of students are not included in this policy, except as provided under the Wyoming Public Records Act.
3. With regard to general health data, only that data/information which is used by the university in making a decision regarding the student's status is subject to review by the student under this policy. Written psychiatric or psychological case notes which form the basis for diagnoses, recommendations, or treatment plans remain privileged information not accessible to the student. Such case notes are not considered to be part of official university records. To ensure the availability of correct and helpful interpretations of any psychological test scores, notes, or other evaluative or medical materials, the contents of these files for an individual student may be reviewed by that student only in consultation with a professional staff member of the specific department involved. Records that are subject to FERPA are not subject to the HIPAA Privacy Rule.

4. Records relating to a continuing or active criminal investigation by the University of Wyoming Police Department, or records of said office not relating to the student's status with the university, are not subject to this policy.
5. No student is entitled to see information or records that pertain to another student, to parents, or to other third parties. A student is entitled to review only that portion of an official record or file that pertains to him or her.
6. The personal files, or sole possession records, of members of the faculty and staff which concern students, including private correspondence, and notes which refer to students, are not regarded as official records of the university. This includes notes intended for the personal use of the faculty and never intended to be official records of the university. In order to be sole possession records, they cannot be shared with anyone else.

Release of Personally Identifiable Information in a Deceased Student's Education Record

The Family Educational Rights and Privacy Act (FERPA)'s protection of personally identifiable information in a student's education record ends at the time of a student's death. The University of Wyoming's policy on the release of a deceased student's records is as follows:

Within the first year following the death of a student, the University will release the educational records of the decedent to the following individuals:

- If the student submitted a signed Authorization to Release Educational Records form which designated the person(s) eligible to request and/or receive educational records, the information will be released to the individual on that form.
- The decedent's next of kin. The request must be accompanied by official documentation.

- The individual designated as the personal representative of the decedent's estate. The request must be accompanied by official documentation.
- Members of the family or other persons with the written approval from the decedent's next of kin or the personal representative of the decedent's estate. Absent written approval from the family or representative of the estate, only directory information will be disclosed.
- In response to a subpoena or court order.
- To any other individual, if determined by the University to be in the best interest of the decedent or the University.

After one year has elapsed following the death of an individual student, the University may release the educational records of the decedent at the University's discretion.

Rights of Students

Students are hereby notified that controlling provisions of federal law are contained in Sec. 438, Pub. L.90-247, Title IV, as amended, 88 Stat. 571-574 (U.S.C. 1232g) and regulations set forth in the code of Federal Regulations, 34 C.F.R. sections 99.1 to 99.67 (1981). Complaints of institutional noncompliance may be made to the Department of Education as provided in the regulations.

Honor Societies and Programs

All Academic Disciplines

Phi Beta Kappa has been one of the most respected societies in the world for more than 200 years. Phi Beta Kappa was founded in 1776 at the College of William and Mary, Virginia. Within a decade, chapters arose at Yale, Harvard, and Dartmouth. The Wyoming chapter received its charter in 1940, and today fewer than 270 colleges and universities in the United States meet the strict qualifications for housing a chapter. UW faculty and administrators annually elect to membership fewer than one-tenth of the leading scholars of the senior class, candidates for the degrees of Bachelor of Arts and Bachelor of Science. In exceptional cases a junior may be elected. In addition to having a distinguished academic record, a student eligible for Phi Beta Kappa must pursue a balanced and broad course of study, which includes a foreign language as well as courses in math, the sciences, and the humanities. At least 90 hours of the student's course work must be in the liberal arts and sciences. Students are reviewed for eligibility and are notified by mail the spring of their election. Phi Beta Kappa promotes the ideal of a community of scholarship, and every year the Chapter sponsors an eminent visiting lecturer for the entire university.

The national honor society of Phi Kappa Phi, founded in 1897, recognizes and encourages superior scholarship in all curricula of the colleges and divisions of the university. No other honor society has higher academic standards for admission. Good character is also an essential supporting attribute for those scholars elected to membership. The University of Wyoming chapter of Phi Kappa Phi sets minimum cumulative grade point requirements at 3.500 for seniors, 3.800 for juniors and 3.900 for graduate students. In addition, there are minimum requirements in terms of hours completed at UW. Since the chapter may initiate no more than ten percent of the number of seniors in each college, the actual grade point cutoff is often higher than these minimums. In the spring of each year, students' records are reviewed and letters of invitation are sent to those eligible for election to the society. Supplementing the work of its chapter, the national society awards fellowships for graduate study.

College of Agriculture and Natural Resources

Agriculture majors - *Alpha Zeta* is a national honorary for students in agriculture who demonstrate academic excellence, character and leadership. Applications for membership are sent to eligible students. *Gamma Sigma Delta* is a national honor society open to students in agriculture. Potential members are invited to membership based upon academic excellence. *Phi Upsilon Omicron* is a national honor society in family and consumer sciences. Potential members are invited to membership based on academic excellence and leadership. *Pi Alpha Xi* is a national honorary horticulture society, open to UW students with a minor in horticulture. Students are invited to join based upon academic excellence and leadership.

College of Arts and Sciences

Art - A *Bachelor of Fine Arts* in art is considered honorary.

Biology and Botany - This Honors Program is for students majoring in biology or botany with strong interests in independent research with a focus in ecology, evolution, systematics, bioinformatics, biostatistics or data science. Application to the biology or botany honors program may be made after completion of the sophomore year with a cumulative grade point average of 3.300.

Chemistry - *American Chemical Society* - The Department of Chemistry is closely associated with the Local Wyoming Chapter of the American Chemical Society. The American Chemical Society (ACS) is one of the largest scientific societies in the world - its purpose is to promote chemistry and educate the public on the impacts of the chemical profession on the economy, technology, and education. The ACS organizes both national and regional scientific meetings; our local section supports student travel to these meetings. The chemistry department also sponsors a Student Affiliates section of the ACS, which is mentored by a UW chemistry faculty member and serves the needs of our chemistry majors.

Communication - *Lambda Pi Eta* recognizes, fosters, and rewards outstanding scholastic achievement while stimulating interest in the communication discipline.

Criminal Justice - *Alpha Phi Sigma - Epsilon Omega Chapter*, criminal justice honorary. A national honorary society for Criminal Justice that recognizes the academic excellence of Criminal Justice students. Alpha Phi Sigma is a collaboration with the Academy of Criminal Justice Sciences.

English - *English Honors Program* enables junior and senior English majors who carry a grade point average of 3.500 or better in their English courses to intensify and enhance their studies by working closely with a supervising faculty member to develop a senior honors project, a piece of writing on a topic in English studies. *Sigma Tau Delta - Alpha Mu Omicron Chapter*, international English honor society.

Gender and Women's Studies - *National Women's Studies Association*; one of its primary objectives promoting and supporting the production and dissemination of knowledge about women and gender through teaching, learning, research and service in academic and other settings.

Geography - *Gamma Theta Upsilon - Eta Eta Chapter* candidates must have completed three semesters of college coursework and three courses in Geography, with a grade point average of 3.000 or higher for these courses. Contact department Department of Geology and Geophysics/Geography Program for more information.

Geology - Eligible students are Bachelor of Science degree holders with honors, majoring in geology or geophysics. They must meet an overall grade point average of 3.200, a grade point average of 3.200 in the major, and successful completion of an independent research project. Contact department Department of Geology and Geophysics/Geography Program for more information.

History - *Phi Alpha Theta* is a professional society whose mission is to promote the study of history through the encouragement of research, good teaching, publication, and the exchange of learning and ideas among historians. It seeks to bring students and teachers together for intellectual and social exchanges, which promote and assist historical research and publication by our members in a variety of ways. The society currently has over 400,000 members, with some 9,000 new members joining each year through 970 chapters nationwide.

International Studies - *Sigma Iota Rho*: The purpose of Sigma Iota Rho is to promote and reward scholarship and service among students and practitioners of international studies, international affairs, and global studies and to foster integrity and creative performances in the conduct of world affairs. Membership provides public recognition of the best and the brightest students in the International Studies major and highlights the importance of contributing to the global community.

Journalism - *Society of Professional Journalists, Sigma Delta Chi*

Languages - The Department of Modern and Classical Languages sponsors chapters of two nationally recognized Honor Societies in Spanish.

Alpha of Wyoming Chapter of Sigma Delta Pi - To honor those who attain excellence in the study of the Spanish language and in the study of the literature and culture of the Spanish-speaking peoples; to honor those who have made the Hispanic contributions to modern culture better known in the English-speaking world; to encourage college and university students to acquire a greater interest in and a deeper understanding of Hispanic culture; to foster friendly relations and mutual respect between the nations of Hispanic speech and those of English speech; to serve its membership in ways which will contribute to the attainment of the goals and ideals of the society.

Sigma Delta Pi National Spanish Honorary Society celebrates its 100th anniversary in 2019. Our very active UW chapter was recognized in 2011 as a national honor chapter. Each semester we initiate new members who meet high academic standards and are dedicated to the study and teaching of Spanish. Chapter awards and student scholarships include study abroad opportunities and recognition of outstanding scholarly research and writing.

Music - *Presser Award* is conferred by vote of the department faculty for outstanding senior in music. *Pi Kappa Lambda*, selected by faculty on the basis of outstanding scholarship and musical accomplishments.

Physics and Astronomy - *Sigma Pi Sigma*: Sigma Pi Sigma (sigmapisigma.org) exists to honor outstanding scholarship in physics, to encourage interest in physics among students at all levels, to promote an attitude of service, and to provide a fellowship of persons who have excelled in physics.

American Physical Society (APS): The American Physical Society (www.aps.org) is a non-profit membership organization working to advance and diffuse the knowledge of physics through its outstanding research journals, scientific meetings, and education, outreach, advocacy and international activities. APS represents over 50,000 members, including physicists in academia, national laboratories and industry in the United States and throughout the world. Society offices are located in College Park, MD (Headquarters), Ridge, NY, and Washington, DC.

American Astronomical Society (AAS): The American Astronomical Society (aas.org) is the major organization of professional astronomers in North America. The mission of the American Astronomical Society is to enhance and share humanity's scientific understanding of the universe.

Political Science - *Pi Sigma Alpha, Epsilon Beta Chapter* seeks "to stimulate scholarship and intelligent interest in political science." The society sponsors programs and events of value to the profession and teaching of political science. Membership provides public recognition of the best and brightest students in the Political Science major. Each chapter is encouraged to provide a framework for enriching the exposure of its members and the wider university community to the study of government and issues of public concern.

Pi Alpha Alpha, national public administration honorary. The purpose of Pi Alpha Alpha is to encourage and recognize outstanding scholarship and accomplishment in public affairs and administration. Its objectives, such as fostering integrity, professionalism, and effective performance, promote the advancement of quality in the education and practice of the art and science of public affairs and administration. PAA membership identifies those with the highest performance levels in educational programs preparing them for public service careers.

Psychology - *Psi Chi* - The Psychology Department supports a chapter of Psi Chi, the International Honor Society in Psychology. This local Psi Chi group functions within a larger Psychology Club that serves undergraduates interested in Psychology. The chapter and club are jointly involved in many activities, including community service projects, peer advising and graduation festivities.

Sociology - *Alpha Kappa Delta*, the international honorary society for sociology. In addition, sociology majors with a 3.2 overall GPA, a 3.500 GPA in sociology courses and two 5000-level sociology classes graduate with honors in sociology.

College of Business

Accounting - *Beta Alpha Psi, Delta Alpha Chapter*, is the UW chapter of the national accounting honorary. Membership in this very active student honorary is awarded only to the very best accounting students.

Business Administration - *Beta Gamma Sigma* is the national scholastic honor society. It is the arm of the accrediting group, AACSB International. Membership is very selective and based on class rank and grade point average.

College of Education

Kappa Delta Pi - Alpha Mu Chapter is the university chapter of the international honor society in education. The purpose of the society is to promote excellence in and recognize outstanding contributions to education. Invitation for membership is extended to those persons who exhibit commendable professional qualities, worthy educational ideals and sound scholarship.

Mu Nu Tau Chapter of Chi Sigma Iota is a Counseling Academic and Professional Honor Society International for counselors-in-training, counselor educators, and professional counselors. The mission of Chi Sigma Iota is to promote scholarship, research, professionalism, leadership, and excellence in counseling, and to recognize high attainment in the pursuit of academic and clinical excellence in the field of counseling. The CSI International homepage can be found at www.csi-net.org/index.cfm. The local chapter, Mu Nu Tau, encourages the furtherance of high standards of scholarship and professional practice through study groups, speaker programs, workshops, colloquia awards, social activities, and networking opportunities.

College of Engineering and Applied Science

Engineering majors - *Tau Beta Pi* is a national honor society for all engineering majors. The purposes of the society are to honor outstanding student scholarship and to provide a spirit of liberal culture in the College of Engineering and Applied Science. Membership is offered to outstanding junior, senior and graduate engineering students of high scholastic ability and exemplary character.

College of Health Sciences

Kinesiology - *Phi Epsilon Kappa* is a national professional fraternity dedicated to enhancing education, promotion of student research, community outreach, and professional development for persons pursuing careers in health, physical education, recreation, and other related fields.

Nursing - *Sigma Theta Tau* - academic leadership honorary. The mission of the Honor Society of Nursing, Sigma Theta Tau International is advancing world health and celebrating nursing excellence in scholarship, leadership, and service.

Pharmacy - *Rho Chi Society, Academic Honorary*. The Rho Chi Society encourages and recognizes excellence in intellectual achievement and advocates critical inquiry in all aspects of pharmacy. The Society further encourages high standards of conduct and character and fosters fellowship among its members; *Phi Lambda Sigma, Pharmacy Leadership Society* - to support pharmacy leadership commitment by recognizing leaders and fostering leadership development.

Social Work - The purpose of the Epsilon Delta Chapter of the Phi Alpha Social Work National Honor Society at the University of Wyoming Division of Social Work is to provide a closer bond among students of social work and promote humanitarian goals and ideals. Phi Alpha fosters high standards of education for social workers and invites into membership those who have attained excellence in scholarship and achievement in social work. The goals of Phi Alpha include the provision of service to the campus, local, and state communities in Wyoming; the promotion of social, economic and environmental justice on campus and in the community; and the development of student leadership skills.

University Honors College

The National Collegiate Honors Council and *The Western Regional Honors Council* provide recognition for students, faculty, and administrators in the area of academic achievement, civic responsibility, and personal development.

College of Law

Law majors - *Order of the Coif* is an honorary society which recognizes legal scholastic excellence. Each year, the chapter may initiate into membership those students who graduate in the highest ten percent of their class.

Academic Majors

The university confers bachelor's degrees for completion of academic disciplines established by the faculties of the colleges of Agriculture, Arts and Sciences, Business, Education, Engineering, Health Sciences, and School of Energy Resources. Within each college, faculty expertise is concentrated in schools, departments, divisions, and programs to provide relevant advice, instruction, service, and research. College and department faculty administer the various major disciplines of study in subject areas selected by the students (including, when authorized, multi-college majors). Majors approved by the Trustees are listed below.

Minimum requirements for earning credits or a degree in any established major are fixed in advance and kept current by the faculty of the responsible units. Most established majors allow the students considerable latitude to attain individual goals. Selection of a major enables the student to study a body of knowledge in depth and concentrate on subjects of particular interest. A student may simultaneously earn credits in two majors, if approved by the respective departments.

If a student is not ready to declare a major concentration, an "undeclared" classification is available in each of the colleges. If the student is not ready to declare a college, a classification of "undeclared college and undeclared major" is available. The "undeclared" status is intended to be temporary for purposes of career exploration. Students are advised to declare and concentrate upon a major discipline as soon as possible.

A student who wishes to concurrently pursue a degree in more than one major must have advance approval of the involved college advisers and deans. Requirements for each of the majors must be fulfilled and credits in each must be applied to the same level of degree (i.e. bachelor's, master's, or doctoral). Students should consult with responsible faculty advisers in each major being attempted. Please refer to the section on concurrent majors and dual degrees in this catalog.

Colleges:

AG: College of Agriculture and Natural Resources
 AS: College of Arts and Sciences
 CB: College of Business
 ED: College of Education
 EN: College of Engineering and Applied Science

HN: Haub School of Environment and Natural Resources
 HS: College of Health Sciences
 LAW: College of Law
 SER: School of Energy Resources
 UW: Interdisciplinary

Degrees:

B = Bachelor's
 M = Master's
 D = Doctorate
 O = Other

Major Title	B	M	D	O
Accounting (CB)	*	*		
African American diaspora studies (AS)	*			
Agricultural business (AG)	*			
Agricultural communications (AG)	*			
Agricultural and applied economics (AG)		*		
Agricultural economics/water resources (AG)		*		
Agricultural education (ED)	*			
Agroecology (AG)	*			
American studies (AS)	*	*		
Animal and veterinary science (AG)	*	*	*	
Anthropology (AS)	*	*	*	
Architectural engineering (EN)	*	*		
Art (AS)	*			
Art Education	*			
Art History (AS)	*			
Astronomy/astrophysics (AS)	*			
Atmospheric Science (EN)		*	*	
Biology (AS)	*			
Biomedical sciences (AG, EN, AS, HS)		*	*	
Botany (AS)	*	*	*	
Botany/water resources (AS)		*		
Business administration (CB)	*	*		
Business economics (CB)	*			
Chemical engineering (EN)	*	*	*	
Chemistry (AS)	*	*	*	
Chemistry (ACS approved) (AS)	*			
Civil engineering (EN)	*	*	*	

Major Title	B	M	D	O
Civil engineering/water resources (EN)		*		
Communication (AS)	*	*		
Computer engineering (EN)	*			
Computer science (EN)	*	*	*	
Counseling (ED)		*		
Counselor education and supervision (ED)			*	
Creative writing (AS)		*		
Criminal justice (AS)	*			
Curriculum and instruction (ED)			*	
Dental hygiene (HS) - Sheridan College	*			
Ecology (UW)			*	
Economics (CB)	*	*	*	
Economics/water resources (CB)		*		
Education (ED)		*	*	*
Electrical engineering (EN)	*	*	*	
Elementary education (ED)	*			
Energy management (CB)		*		
Energy resource management and development (SER)	*			
Energy systems engineering (EN)	*			
English (AS)	*	*		
Entomology (AG)		*	*	
Entrepreneurship	*			
Environment and natural resources (affiliated major) (HN)	*	*		
Environmental engineering (EN)		*		
Environmental geology/geohydrology (AS)	*			
Environmental systems science (HN)	*			
Family and consumer sciences (AG)	*	*		

Colleges:		Degrees:	
AG: College of Agriculture and Natural Resources	HN: Haub School of Environment and Natural Resources	B = Bachelor's	
AS: College of Arts and Sciences	HS: College of Health Sciences	M = Master's	
CB: College of Business	LAW: College of Law	D = Doctorate	
ED: College of Education	SER: School of Energy Resources	O = Other	
EN: College of Engineering and Applied Science	UW: Interdisciplinary		

Major Title	B	M	D	O
Finance (CB)	*	*		
Food science and human nutrition (AG)		*		
French (AS)	*			
Gender and women's studies (AS)	*			
Geography (AS) <i>*under review</i>	*			
Geography/water resources (AS) <i>*under review</i>				
Geology (AS)	*	*	*	
Geology and earth sciences (AS)	*			
Geology/water resources (AS)		*		
Geophysics (AS)		*	*	
German (AS)	*			
Health services administration (HS)		*		
History (AS)	*	*		
Hydrologic science (UW)			*	
International studies (AS)	*	*		
Journalism (AS)	*			
Juris Doctor (LAW)				*
Juris Doctor/Master of Arts in Environment and Natural Resources (interdisciplinary)				*
Juris Doctor/Master of Public Administration (interdisciplinary)				*
Kinesiology and health (HS)		*		
Kinesiology and health promotion (HS)	*			
Management and marketing (CB)			*	
Marketing (CB)	*		*	
Mathematics (AS)	*	*	*	
Mechanical engineering (EN)	*	*	*	
Medical laboratory science (HS) - UW-Casper	*			
Microbiology (AG)	*			
Molecular and cellular life sciences (UW)			*	
Molecular biology (AG)	*	*	*	
Music (AS)	*			
Music education (AS)	*	*		
Music performance (AS)	*	*		*
Native American and Indigenous Studies (AS)	*			
Natural science (UW)		*		
Neuroscience (UW)			*	
Nursing (HS)	*	*		
Nursing practice (HS)			*	

Major Title	B	M	D	O
Organizational leadership (Bachelor of Applied Sciences) (AG)	*			
Outdoor recreation and tourism management (HN)	*			
Petroleum engineering (EN)	*	*	*	
Pharmacy (professional) (HS)				*
Philosophy (AS)	*	*		
Physical education teaching (HS)	*			
Physics (AS)	*	*	*	
Physiology (AS)	*			
Planning (community and regional) (AS)		*		
Plant sciences (AG)		*	*	
Political science (AS)	*	*		
Professional Sales	*			
Psychology (AS)	*	*	*	
Public administration (AS)		*		
Rangeland ecology and watershed management (AG)	*	*	*	
Rangeland ecology and watershed management/water resources (AG)		*		
Religious studies (AS)	*			
Secondary education (ED)	*			
Social science (AS)	*			
Social work (HS)	*	*		
Sociology (AS)	*	*		
Soil science (AG)		*	*	
Soil science/water resources (AG)		*		
Spanish (AS)	*	*		
Speech, language and hearing sciences (HS)	*			
Speech-language pathology (HS)		*		
Statistics (AS)	*	*	*	
Theatre and dance (AS)	*			
Theatre and dance (professional) (AS)	*			
Wildlife and fisheries biology and management (professional) (AS)	*			
Zoology and physiology (AS)		*	*	
Zoology and physiology/water resources (AS)		*		
Zoology (AS)	*			

Admission to the University

Admissions Office
150 Knight Hall
Department 3435
1000 E. University Avenue
Laramie, WY 82071-2000
www.uwyo.edu/admissions
307-766-5160
800-342-5996

Undergraduate Admission

UW welcomes all students to apply and will consider each student based on their individual academic achievement. Admission and programs of the University of Wyoming are offered to all eligible people without regard to race, gender, religion, color, national origin, disability, age, protected veteran status, sexual orientation, gender identity, genetic information, creed, ancestry, political belief, or any other applicable protected category. The Director of Admissions, through the Provost, is responsible for the admission of students. Admission of graduate students must also be recommended by the department of an applicable graduate program.

I. Definitions

Diploma: A formal document certifying the successful completion of a prescribed program of studies.

First Time Student: A student who has no prior postsecondary experience attending any institution for the first time at the undergraduate level. There are two exceptions: (1) students who attended any institution for the first time the summer prior to entering the University of Wyoming in the fall term and (2) students who enter UW with advanced standing (college credits earned before graduation from high school).

High School Student: A student enrolled in secondary school or pursuing a high school diploma or recognized equivalent. Includes students who have not received but are pursuing a high school diploma or recognized equivalent and taking college coursework concurrently.

High School Success Curriculum: Coursework during high school that includes successful completion of the following:

- A. Four (4) years of English;
- B. Four (4) years of math (including algebra I, II, and geometry);
- C. Four (4) years of science (including at least one year of physical science);
- D. Three (3) years of social science;
- E. Four (4) years of additional coursework including at least two (2) years of related courses taken in sequence (including fine and performing arts, career-vocational education, or foreign language).

Nationally Standardized Tests: ACT Assessment (ACT) or SAT Assessment (SAT) test results. Test results must be sent to the Admissions Office. SAT Assessment scores will be based off the Evidence-Based Reading and Writing + Math sections for exams administered in or after April 2016.

Returning Student: A student who previously attended UW but has not been enrolled for three consecutive semesters, including a summer term.

Transfer Student: A student entering the University of Wyoming for the first time but known to have previously attended a postsecondary institution at the same level (e.g., undergraduate, graduate). This includes new students enrolled in the fall term who transferred into the institution the prior summer term. The student may transfer with or without credit.

II. Undergraduate Admission Requirements

All applicants for admission under twenty-one (21) years of age or transfer students who have fewer than twelve (12) transferable semester credit hours after high school, must provide an official copy of their ACT or SAT test results. Test results must be sent to the Admissions Office.

A. First Time Students

Admission into a degree seeking program shall be based on individual academic achievement. The University seeks to admit qualified undergraduate students who are new first time students or students that are concurrently enrolled in post-secondary education classes. To be considered for admission, prospective students must submit an application, a one-time nonrefundable application fee, official high school transcripts (or high school equivalency exam), and an official ACT or SAT test score (if the applicant is under 21) to the University's Office of Admissions.

B. Assured Admission

Assured undergraduate admission shall be granted to high school graduates who meet the following requirements:

1. A cumulative, un-weighted high school GPA of 3.000 (on a 4.000 scale);
2. A minimum composite ACT score of 21 or SAT score of 1060; and
3. Completion of the High School Success Curriculum while attending high school.

C. Admission with Support

Undergraduate admission with support shall be granted to high school graduates who meet the following requirements:

1. A cumulative, un-weighted high school GPA of 2.500-4.000 and a minimum ACT score of 17 or SAT score of 900, or 2.250-2.490 and a minimum composite ACT score of 20 or SAT score of 1020; and
2. Completion of the High School Success Curriculum with no more than two deficiencies. Both deficiencies cannot occur in the same curriculum category.

Students admitted with support are required to participate in the University's academic transition programs administered by the Learning Resource Network (LeaRN).

D. Admission with Alternative Educational Credentials

Undergraduate applicants with General Education Development (GED) credentials or other approved alternative educational credentials (i.e., High School Equivalency Test (HiSet)) should contact the University's Office of Admissions for specific application requirements. Students under 21 years of age with GED or the approved credentials must also have a minimum ACT score of 17 or SAT score of 900.

E. Transfer Students

Transfer students with twelve (12) or more transferable hours after high school must submit an application, a one-time nonrefundable application fee, and official transcripts from each previously-attended higher education institution. Transfer students must have at least a 2.000 cumulative GPA for undergraduate admission.

Transfer students with eleven (11) or less transferable hours after high school must also submit, official high school transcripts (or approved alternative education credentials), official ACT or SAT test score (if the applicant is under 21) and official transcripts from each previously-attended higher education institution. Admissions to transfer students with eleven (11) or less transferable hours must have at least a 2.000 cumulative GPA as well as meet the assured admissions requirements for first time students.

Official transcripts must be sent directly from the institution(s) to the University's Office of Admissions. Failure to disclose all previously attended institutions will be seen as a deliberate attempt to withhold academic history and may be reason for denied admissions and/or dismissal.

F. Home Schooled Students

Home schooled students shall be considered for admissions under the same requirements as First Time students.

G. Returning Students

Students returning to the University of Wyoming after not registering for classes for three or more consecutive semesters, including a summer term will need to submit a new application, provide official transcripts from all institution(s) attended since leaving the University of Wyoming, and be in good academic standing. Failure to disclose information about all institution(s) attended will be seen as a deliberate attempt to withhold academic history and may be reason for denied admissions and/or dismissal. Returning students must have a minimum 2.000 cumulative GPA from all undergraduate institutions.

Students suspended from the University of Wyoming must complete the reinstatement process. Academic reinstatement to the University of Wyoming does not constitute admissions to the institution. Students seeking reinstatement are required to meet admissions eligibility and criteria.

H. Holistic Alternative Admission

The University has the discretion to admit students who do not qualify under the above-described criteria.

III. International Students

Admission of international students is governed by the Admission Policy for International Students. This Policy is supplementary to the general admission policies described in this Regulation and provides for general admission standards for all international student applicants, including procedures for review and consultation with the various academic colleges and departments.

The Admission Policy for International Students shall be maintained and revised as determined by the Provost. Revisions are subject to the approval of both the Provost and the Associate Vice Provost for Enrollment Management, and shall become effective from the date of their approval.

The Admission Policy for International Students shall be published and distributed by the Office of Admissions and will be available through the Admission Office's website.

IV. High School Guests

High school students requesting admission as high school guests must submit transcripts demonstrating a cumulative high school GPA of 3.000 on a 4.000 scale (official high school transcripts must be sent directly from the high school to the Office of Admission); a written recommendation from a high school counselor or principal; and official ACT or SAT test scores, if any.

V. Non-Degree Students

The non-degree admission status is a special status that is not available to international students or students who have a suspension status at UW or another college or university.

Applicants seeking admission as non-degree undergraduate students must submit an application and a one-time nonrefundable application fee to the Office of Admissions. Under this admission status, undergraduate students may take a maximum of eight (8) credit hours per semester and cannot apply more than twelve (12) total credits taken as a non-degree student toward an undergraduate degree.

VI. Second Bachelor's Degree Students

Students who have received a bachelor's degree from the University of Wyoming and are seeking a second bachelor's degree, but have not taken coursework since graduation, must submit a new application.

Students who have received a bachelor's degree from another institution, or who graduated from the University of Wyoming and have taken courses at another institution since leaving the University, must submit an application, a one-time nonrefundable application fee, and official transcripts from each previously-attended higher education institution. Official transcripts must be sent directly from the institution to the University's Office of Admissions.

VII. Graduate Admission

A. Graduate Applicants

Prospective students are encouraged to consult with their respective academic department regarding the admission process before making a formal UW application.

Applicants must submit the UW graduate application and the non-refundable application fee. One set of official transcripts must be sent directly to the UW Admissions Office from each previous collegiate institution.

Domestic applicants must have completed a bachelor's degree or equivalent from a regionally accredited institution. All applicants should have at least a 3.000 cumulative GPA (scale of 4.000).

Some graduate programs may require standardized examination scores for admission.

Applicants whose department requires the Graduate Record Examination (GRE) must request official scores be sent to the Admissions Office directly from the Educational Testing Service (ETS). Our institution code with ETS is 4855.

Some departments may require scores from the Graduate Management Admission Test (GMAT), rather than the GRE.

Letters of recommendation may also be required by some departments. Please see the academic department or program entries elsewhere in the Catalog for details about admission requirements.

Graduate applicants should contact the respective academic departments for questions concerning application status, degree program requirements, deadlines, and supplemental application materials they may require.

Admission Status Categories

Advanced-degree applicants may be admitted to the University of Wyoming in one of the following categories:

1. Admitted Graduate Student signifies the applicant has been accepted by the university and by a major department to work toward an advanced degree.
2. Conditional admission of a Graduate Student signifies the applicant did not meet the formal admission requirements but has sufficient potential that the university and the major department are convinced that the student will be successful as an advanced-degree candidate. Conditions are usually placed on such students in the form of performance criteria for the first one or two semesters. If the conditions of admission are not met within first two semesters, the student may be denied admission to the university graduate program and the degree program. At minimum, conditionally admitted graduate students must maintain a 3.000 GPA through their first semester. Failure to do so will result in revocation of admission. More restrictive conditions may be defined by the department.

Students admitted with graduate standing may elect to take any undergraduate or graduate courses for which they are prepared, subject to restrictions as outlined in the *University Catalog*. However, tuition will be assessed at the graduate level for all courses taken with graduate status. Admission to graduate study does not automatically make a student a candidate for an advanced degree.

Note: Students working toward a second bachelor's degree are not considered graduate students and are subject to all undergraduate regulations.

B. International Graduate Applicants

All graduate international students must also submit the following in addition to application materials required by the Academic Department.

1. Provide proof of satisfactory English ability if student's native language is not English. This can be done by providing official score reports from TOEFL or IELTS. The minimum acceptable TOEFL score is 540 (76 iBT). The minimum acceptable IELTS score is 6.5. Please note that some departments require higher TOEFL/IELTS scores than what is required by the Admissions Office.
2. As with the GRE/GMAT scores, many departments may require a higher level of English proficiency than what is required by the Admissions Office.
3. Provide evidence of adequate financial resources to pay the total cost of their education. The Confidential Financial Statement for undergraduate international applicants can be found online at www.uwyo.edu/admissions/international/requirements-graduate.html. Students who are awarded a full graduate assistantship may not need to provide this documentation.

C. Graduate Non-Degree Student

1. Must complete and submit a Non-Degree Student application including a non-refundable \$50.00 application fee.
2. Transcripts are required for proof of undergraduate degree for non-degree status, and must be submitted to the Admissions Office.
3. Non-degree students may enroll in a maximum of 8 credit hours per semester (maximum of two courses). Only 12 credit hours taken in this status may be used towards a UW degree. This 12-credit hour rule may be decreased if prior courses were reserved for graduate credit as either an undergraduate or as non-degree student.
4. Admission with non-degree status is not available to international students or students on suspension.
5. Students admitted with non-degree status are assessed tuition and fees at the same tuition rate as degree-seeking students.
6. Students admitted with non-degree status do not qualify to receive financial aid.
7. Non-degree graduate students who decide to pursue a degree must apply to and be accepted by their respective graduate program and the Admissions Office.

VIII. College of Law Admission

(307) 766-5419

E-mail: lawadmis@uwyo.edu

Web site: www.uwyo.edu/law/

Admission to the professional curriculum of law is granted by the College of Law Admissions Committee. The College of Law reserves the right to restrict the number of entering students to a class size consistent with its facilities and its educational objectives. Additional information and requirements are provided on the College of Law website.

1. Complete the electronic University of Wyoming College of Law Application for Admission through LSAC between September 1 and April 30. Applications received by December 15 will be considered for early admission.
2. Submit the application fee online through the College of Law website or by sending a check or money order to the College of Law.
3. Applicants must have a bachelor's degree from an accredited college or university (subject to some limited exceptions).
4. Take the Law School Admission Test (LSAT) administered by the Law School Admission Council (LSAC) no later than the April administration. Beginning in 2019, the LSAT will be given ten times each year at numerous locations within and outside of the United States. Information about the test, dates, test locations and application form may be obtained from LSAC, Box 2000, Newtown, PA 18940-0998, (215) 968-1001, or on the Web at www.lsac.org.
5. Register with LSAC's Credential Assembly Service (CAS) between September and January. Registration with CAS can be completed through the LSAC website (www.lsac.org). An official transcript from each college attended must be sent directly to CAS. It is advisable to register with CAS at the same time one registers for the LSAT. CAS prepares a report and forwards a copy to each law school to which application has been made. Applicants do not send transcripts directly to the College of Law until they are admitted. For more information about CAS, go to www.lsac.org.
6. International students must supply current TOEFL scores. Minimum scores required for admission are 600 on the written exam or 100 on the internet-based exam. International students must take the LSAT exam and register with the Law School Admissions Council (www.lsac.org). If a transcript analysis will not be provided by the LSAC for any foreign educational institutions attended, official transcripts must be provided with an English translation.

IX. WWAMI Medical Education Program

WWAMI is a contract program between the State of Wyoming and the University of Washington for medical education. Admission is twofold.

1. Applicants must be certified residents of Wyoming. To be eligible for certification, the applicant or parent or guardian must be a legal resident of the State of Wyoming for five continuous years immediately prior to enrolling in the WWAMI program. The application for certification is available by Jun 1 at www.uwyo.edu/certwy and is due no later than October 15 of the year prior to the anticipated start date of medical school. Participants pay reduced tuition and must either pay back the money expended on their behalf plus interest or practice medicine in Wyoming for three years.

2. Applicants apply to the University of Washington School of Medicine through the usual procedures and are subject to criteria established by the University of Washington.

Information may be obtained from the College of Health Sciences, Preprofessional Advising Office, Dept. 3432, 1000 E. University Ave., Laramie, WY 82071; (307) 766-3878 or certoff@uwyo.edu.

X. WYDENT Dental Education Program

WYDENT is a contract program between the State of Wyoming and the University of Nebraska College of Dentistry and Creighton University School of Dentistry for dental education. Admission is twofold.

1. Applicants must be certified residents of Wyoming. To be eligible for certification, the applicant or parent or guardian must be a legal resident of the State of Wyoming for five continuous years immediately prior to enrolling in dental school. The application for certification is available by June 1 at <http://www.uwyo.edu/certwy> and is due no later than October 15 of the year prior to the anticipated start date of dental school. Participants pay reduced tuition and must either pay back the money expended on their behalf or practice dentistry in Wyoming for three years.
2. Applicants must apply to the dental schools through the usual procedures and are subject to admission criteria established by the dental schools.

Information is available from the College of Health Sciences; Preprofessional Advising Office; Dept. 3432, 1000 East University Ave; Laramie WY 82071; (307) 766-3878 or certoff@uwyo.edu.

XI. School of Pharmacy Admission

Admission to the preprofessional pharmacy program is through the university admission process described previously.

Admission to the professional curriculum leading to the entry-level professional Doctor of Pharmacy (Pharm.D.) degree is granted by the Dean of the School of Pharmacy upon the advice of the School of Pharmacy Admissions Committee. The Pharmacy Early Assurance (PED) program grants admission to the professional program to qualified freshman who meet program requirements. All preprofessional students participate in the application process. The application process requires that students apply to the School of Pharmacy using PharmCAS, for more information about PharmCAS log on to www.Pharmcas.org. Admission to the professional program is limited and competitive. For further information, contact the School of Pharmacy, Dept. 3375, 1000 E. University Ave., Laramie, WY 82071; (307) 766-6132.

XII. Other Information

Wyoming Senior Citizen Policy

Wyoming senior citizens, age 65 and over, who have been admitted to UW may enroll in university courses on a space available basis at no cost upon presentation of evidence of age and Wyoming residence prior to the beginning of the term in which classes will be taken.

Scheduled Distance Education classes which meet minimum enrollment requirements are included in the courses available to senior citizens.

Board of Trustee Retirement Benefits

Beginning Spring 2002, official board retirees may attend University of Wyoming classes on a space available basis at no cost. To qualify for this benefit, you must be an official board retiree, 25 years of university service or age 60 with 15 years of immediately preceding university service. The spouse of an eligible retiree may receive a fifty (50) percent tuition discount and a surviving spouse may receive the employee's full tuition discount provided space is available. The spouses must contact Student Financial Services at sfs@uwyo.edu or (307) 766-6233 in order for this benefit to be applied.

Readmission

Readmission is the process for former University of Wyoming students to again be admitted to the university. Former UW students who have attended another college since their last UW enrollment must have one official transcript from each college sent directly to the UW Admissions Office. Undergraduate students who are returning to UW after an absence of one year or longer should complete an application for admission at least 30 days prior to registration, thereby allowing sufficient time to avoid delays in registration.

Academic Reinstatement: Former students who are on academic suspension at UW must petition for reinstatement through the dean of their college. A petition for reinstatement must be submitted no later than 15 days before the beginning of the semester or summer term in which the student wishes to register. A petition received after this deadline may not be processed until after the regular registration period.

Academic Renewal: An undergraduate student who returns to UW and has not completed a college course at UW, during the previous five years, will have the option of continuing his or her earlier UW cumulative GPA or commencing a new cumulative GPA under the Academic Renewal policy. Interested students must submit the Academic Renewal Application Form (which can be obtained in the Office of the Registrar) to the registrar no later than ten class days before the last day of classes of the semester in which the student returns to UW.

The entire UW transcript will remain intact. A note indicating the policy will precede the new part of the UW transcript if the student opts for academic renewal. At the discretion of the academic department in which the student is enrolled, credit hours for which the student earned the grade of C or better may be applied toward the completion of the degree requirements. The list of any departmentally approved courses must be indicated on the Academic Renewal Application Form when initially submitted to the registrar. No further changes may be requested.

A student's GPA and completed courses that were applied to a baccalaureate degree are not eligible for academic renewal.

Readmission for Military Service Members

Policy

The University of Wyoming acknowledges that students may be temporarily unable to attend classes or be required to suspend their studies in order to perform military service. UW encourages such students to resume their education once a military service obligation has ended and adopts this policy to ensure the timely readmission of such students.

In accordance with federal regulations, 34 C.F.R. 668.18 and the Department of Defense (DOD) Voluntary Partnership Memorandum of Understanding (MOU), the university will promptly readmit service members who seek readmission to a program that was interrupted due to a uniformed service obligation.

Student Responsibility

The student must provide oral or written notice of a uniformed service obligation to the Veterans Service Center as far in advance as possible, unless precluded by military necessity. Such notice does not need to indicate when the student will return to the university.

Tuition and Fees

A returning student must be charged the same tuition and fees in effect during the last academic year the student attended, unless veteran's education benefits or other service member education benefits will pay the amount in excess. For subsequent academic years, the returning student may not be charged tuition and fees in excess of what other students in the program are charged.

Readmission Requirements

A returning student will be permitted to reenroll in the next semester scheduled in the same academic program, unless the student requests a later date of reenrollment or agrees to a different program. A returning student will be readmitted into the same academic program the student was enrolled in prior to the military service or the student requests admission to a different program.

If the university determines that a returning student is not prepared to resume the program or is unable to complete the program, the university must make reasonable efforts to enable the student to resume or complete the program at no additional cost to the student. If such efforts are unsuccessful or place an undue hardship on the university, the university is not required to readmit the student.

In accordance with federal regulations, returning student who receive a dishonorable or bad conduct discharge from the Armed Forces (including the National Guard and Reserves) are not eligible for readmission under this policy. However, service members who receive dishonorable or bad conduct discharge may remain eligible for readmission even though they will not be entitled to the benefits outlined in this policy.

Residency Student Classification

The following Trustee regulations govern the classification of students at the University of Wyoming as resident or non-resident for tuition purposes, and shall be administered by the Associate Vice President for Enrollment Management and Registrar. (Trustee Regulation, Chapter VIII, Section 3.) See the University Regulations online for the most up-to-date version.

Student Classification for Tuition Assessment

Residing in Wyoming primarily as a student will not support a claim for resident status for tuition purposes. Qualifying for residency for tuition purposes at the University of Wyoming differs from what is normally required to be a “resident” of the State of Wyoming. A person may be considered a “resident” of Wyoming and still be a Non-Resident for tuition purposes at the University of Wyoming.

The governing regulation for residency classification for tuition and fee purposes, as approved by the University of Wyoming Board of Trustees, is UW Regulation 2-200. See the University Regulations online for the most up-to-date version.

Process

The University of Wyoming will determine the initial classification of resident or nonresident status for tuition purposes. Students classified as nonresidents who feel they meet residency requirements may apply to change their status through a form approved by the Office of the Registrar.

If a student classified as an out-of-state resident for tuition purposes wishes to petition their residency status at the University of Wyoming, they will need to conclusively demonstrate they have established a permanent home in Wyoming. Students must submit the Petition for Residency for Tuition Purposes, along with all specified relevant, appropriate, and verifiable documentation to the Office of the Registrar. The deadline for submission is no later than 5 p.m. of the first day of classes for the semester the student wishes to petition, based off of the University’s academic calendar. The student bears the burden of providing documentation to show a permanent home has been established in Wyoming based on the required criteria of UW Regulation 8-1(III)(B)(8). See the University Regulations online for the most up-to-date version.

The Registrar or designee will evaluate the student’s petition and documentation to determine whether the student has established a permanent home in Wyoming based on the requirements set forth in UW Regulation 8-1(III)(B)(8) or met any other residency criteria in UW Regulation 8-1. See the University Regulations online for the most up-to-date version. If a student subsequently meets the criteria of being a resident for tuition purposes, the student’s residency status will be reclassified by the Office of the Registrar and the resident tuition rate will become effective the semester the student submitted the petition. Under no circumstances will any tuition or fee adjustments be retroactively applied to previous semesters.

If a student’s petition is denied, the student will be notified in writing of the denial.

Appealing the Registrar’s Decision

If a student has a petition denied by the Registrar, the student may appeal the decision by submitting the Denied Residency Petition Appeal form to the Office of the Registrar within ten (10) calendar days of the original decision by the Registrar or designee.

The Residency Classification Committee will receive the student’s Denied Residency Petition Appeal form, the written decision of the Registrar, and the student’s previously-submitted petition and documentation which were submitted to the Registrar prior to the submission deadline for that semester. The Residency Classification Committee will determine if an error was made by the Registrar and will make a decision to affirm or reverse the classification decision of the Registrar. The decision of the Residency Classification Committee is final and there is no further level of appeal for that semester.

Measles, Mumps, Rubella (MMR) Immunization Requirement

The University of Wyoming has implemented a policy to protect the University community against measles (rubeola), mumps, and rubella. All new on-campus students must provide proof of immunity to measles, mumps, and rubella prior to registration. Two doses of MMR vaccine (or equivalent) are required. The MMR immunizations dates are to be entered into the Student Health Service Patient Portal (on the Student Health Service’s webpage, <http://www.uwyo.edu/shser/>). Incoming students will use their UW user names and passwords to enter the Patient Portal, and click on Immunizations. Once the immunization dates are entered, students will upload a verified immunization record into the Patient Portal.

The only contraindication to the MMR immunization is a previous severe allergic reaction to the vaccine or vaccine component (neomycin, gelatin). Relative (temporary) contraindications include: pregnancy; persons with immunosuppressive illnesses or treatment; moderate or severe acute illness; and recent receipt of blood products. If you are uncertain as to whether you should receive the immunization, please talk with your health care clinician.

Exemptions may be granted to the requirement in two instances: a medical exemption for a contraindication noted above, and a religious exemption. A medical exemption requires completion of the Medical Exemption Form with a notation of the reason for the exemption and a medical clinician signature. To request a religious exemption, a notarized form must be completed and submitted. Exemption forms can be found on the Student Health Service website (www.uwyo.edu/shser), and the original form must be submitted. If an outbreak of one of these illnesses occurs on campus, students granted an exemption may be excluded from campus for the duration of the outbreak.

For students unable to verify MMR vaccinations, the vaccine is available at the Student Health Service for a nominal charge. It will be administered prior to registration for any eligible student, without an appointment, during office hours. Do not wait until registration to comply with the MMR immunization requirement, as this will delay the process.

In addition to the MMR requirement, international students are required to undergo tuberculosis screening prior to registration. Based on screening, a tuberculosis (Mantoux) skin test or (IGRA) blood test may be performed, and, if positive, a chest x-ray obtained with consultation with a Student Health Service physician. The student is responsible for the costs incurred for these tests.

Campus Safety

The University of Wyoming Police Department (UWPD) provides comprehensive law enforcement and security services to all components of the University including the academic campus, and other properties owned or controlled by the University. The University Police Officers are commissioned under Wyoming State Statute and have the full range of police authorities granted any peace officer including power to arrest, on property owned by or under the control of the University of Wyoming, including adjacent public streets and sidewalks. University Security Officers work closely with our police officers in constantly patrolling University properties and assisting employees and visitors in accessing University facilities. The UWPD operates 24 hours a day, 365 days a year, and is located at 1426 East Flint, Laramie, Wyoming 82071.

Campus safety is the responsibility of all members of the university community. Faculty/staff, students, and guests are encouraged to report crimes and other concerning behavior or observations promptly. The Dean of Students Office, Student Conduct, The STOP Violence Program, and the Office of Diversity and Employment Practices are available to provide further information.

A full description of campus safety, crime statistics, and educational programs designed to increase safety on campus is available in the 2014 Annual Security and Fire Safety Report of the University of Wyoming. To access the report, go to www.uwo.edu/uwpd/_files/2015uwsecurityreport.pdf.

Scholarships and Student Financial Aid

The Office of Scholarships and Financial Aid coordinates all student financial assistance available at UW. Available aid includes scholarships, grants (Hathaway Scholarships, Federal Pell, Federal SEOG), loans (Federal Direct, Federal PLUS and private) and employment (Federal Work-Study).

The Scholarships and Financial Aid office will help all qualified applicants to secure aid, but resources are limited. Aid is offered first to those applicants whose materials are completed and received by December 1 prior to the academic year for which aid is sought. Federal Pell Grants and Federal Direct Loans are available to qualified applicants throughout the year.

Unless another deadline is specified, prospective students seeking scholarships should send an application for admission, the nonrefundable application fee and a copy of their current high school or college transcript to the UW Admissions Office by March 1. Students who have attended another college must have that college submit an academic transcript to the UW Admissions Office.

Students seeking federal aid or assistance based on their financial need must file a Free Application for Federal Student Aid (FAFSA). Applicants may do so at studentaid.gov. Allow one week for processing. UW recommends using IRS Data Retrieval when completing the FAFSA. Final responsibility for ensuring that all required documents are received in a timely manner rests with the applicant. The FAFSA will be available October 1 for completion.

Eligibility Requirements

To receive federal financial aid (such as Federal Pell, and Federal SEOG grants, Federal Work Study, Federal Direct [subsidized or unsubsidized], and Federal Direct PLUS loans) you must meet the following conditions and provide supporting documentation when requested to do so: have a high school diploma or its equivalent, be enrolled or accepted for admission as a regular student at UW, not be concurrently enrolled in an elementary or a secondary school, be enrolled in a degree program, be a U.S. citizen or eligible non-citizen, have a demonstrated financial need if required, be prepared to prove attendance, maintain satisfactory academic progress (SAP), not be in default on a federal student loan or owe an overpayment of a federal grant at any institution (or, if so, have made satisfactory arrangements to repay or otherwise resolve the overpayment or default), not have borrowed in excess of the annual or aggregate loan limits of a federal loan program (loan borrowers only), agree to use funds received only for educational costs, register with the Selective Service if required, and not have had federal financial aid benefits suspended as result of a drug conviction.

Enrollment Requirements

Students must attend classes to be eligible for federal financial aid or be prepared to pay all the money back. Most scholarships require the recipient to be enrolled full time. Hathaway Scholarships, Federal Pell Grants, and veteran's benefits may be pro-rated for part-time enrollment and Federal Direct Loans may only be borrowed by students

enrolled for at least half time (a minimum of 6 hours for undergraduate and pharmacy students; a minimum of 4.5 hours for graduate and law students). Federal Pell Grants and Federal SEOG Grants are available to undergraduate students who have not completed the requirements for their first undergraduate degree. Classes for audit are not acceptable for any kind of financial aid. Generally, Federal aid is not available for continuous registration hours, or for audit hours. For details, contact the Office of Scholarships and Financial Aid.

Satisfactory Academic Progress (SAP)

The University of Wyoming Office of Scholarships and Financial Aid is responsible for ensuring that all students receiving federal financial aid meet minimum standards. The University of Wyoming standard of Satisfactory Academic Progress (SAP) measures all students' academic performance.

Satisfactory Academic Progress is reviewed at the end of each payment period (fall, spring, summer) and the following three areas are measured:

1. Qualitative -- UW cumulative grade point average (Cum GPA) earned
2. Quantitative (Pace) -- completion rate for coursework enrolled
3. Timeframe -- maximum time frame to complete a degree

Minimum Standard Requirements

Qualitative Standard

A student must successfully meet the following minimum UW cumulative GPA for their program:

- Undergraduate programs - 2.0
- Professional programs - 2.0
- Graduate programs - 3.0

Quantitative Standard (Pace)

A student must successfully complete 67% of the cumulative hours attempted.

$$\text{Pace} = \frac{\text{Cumulative \# of credit hours successfully completed}}{\text{Cumulative \# of credit hours attempted}}$$

The following courses do count as attempted and completed in the SAP calculation.

- Successfully completed courses with grades of A, B, C, D, or S
- Transfer hours accepted by the Registrar
- Academic Renewal hours earned through previous enrollment
- Advanced Placement Credit
- Incomplete grades that are now completed
- Experiential Learning Credits
- Summer Session credits successfully completed
- Credits earned through Study Abroad and Consortium agreements

The following courses do count as attempted and not completed in the SAP calculation:

- Failed
- Withdrawn
- Incomplete
- Repeat
- Unsatisfactory

The following courses do not count as attempted or completed in the SAP calculation:

- Correspondence
- Audit
- Credit by exam
- Remedial
- Enrichment

Timeframe Standard

A student must be making progress toward a degree. The University of Wyoming sets the following maximum timeframe for student degrees:

- Undergraduate- 180 hours (150% of 120 hours)
- Master's Program- 45 hours (150% of 30 hours)
- Doctorate Program- 108 hours (150% of 72 hours)
- Law- 135 hours (150% of 90 hours)
- Pharmacy- 213 hours (150% of 146 hours)

Transfer hours accepted toward completion of the student's program are used in the calculation of the Timeframe Standard.

When pursuing multiple degrees or changing majors the maximum time frame may be adjusted based on a student generated appeal that includes a degree audit.

SAP Statuses

Financial Aid Warning

Students who have not met the minimum standard requirements for the previous semester will be placed on a Warning status. Students on Warning status are eligible for financial aid for one additional payment period. Students who do not meet Minimum Standard Requirements at the end of their Warning semester will be placed on Suspension for the next term. *Note:* Students who receive all failing grades in a semester are immediately placed on financial aid suspension. Students who fail the timeline standard will also be placed on immediate suspension.

Financial Aid Suspension

Students who have not met the minimum standard requirements (after being placed on Warning) are placed on Suspension. Students who are on Suspension are not eligible for financial aid unless a SAP appeal with academic plan is approved by the SAP Committee. Submitting an appeal does not guarantee approval. Students awaiting a decision on their SAP appeal are responsible for paying their tuition and fees by the payment deadline. Students having met the maximum timeframe are not eligible for a "Warning" period.

Financial Aid Probation

Students who have successfully appealed a financial aid suspension are placed on probation and are eligible to receive federal aid for one more payment period. After Probation, the student must be making SAP or successfully following their academic plan. Students are reviewed each term for compliance with their Academic Plan and SAP Standards.

Reinstatement

If a student loses federal financial aid eligibility due to not meeting SAP standards, they can regain eligibility in one of the following ways:

1. Completing courses using their own resources that will satisfy the deficient SAP area.
2. Successfully appealing by submitting a SAP Appeal Form with supporting documentation.

SAP Appeal Process

Students who have been suspended can appeal their status by submitting the SAP Appeal Form (one semester or multi semesters) and a formal written request with supporting documentation to the financial aid office no later than the conclusion of the "Drop/Add" period for the current semester. The appropriate appeal form is available to the student once they have met with a SAP counselor. The SAP Appeal Form must include the following:

- an explanation with supporting documentation of any extenuating circumstances that prevented the student from maintaining satisfactory academic progress,
- an explanation of what has changed that will allow the student to succeed academically,
- an academic plan signed by academic advisor that will enable student success, and
- a degree audit for those students who have reached their maximum timeframe.

All appeals are reviewed by a Financial Aid SAP committee. The review time for appeals may take a minimum of 2 weeks. Students will be notified of the results by email and/or mail. If the appeal is denied, students may request an additional review by the Director of Scholarships and Financial Aid. Students must submit new information with supporting documentation for a secondary review. The Director's decision is final.

Financial Aid Federal Return of Funds Policy

A student who receives federal financial aid (other than Federal Work Study pay checks) and chooses to complete less than 60% of an academic term is considered not to have earned all the federal aid he or she has been awarded.

- If aid already disbursed is equal to earned aid, no further action is required.
- If aid already disbursed is less than earned aid, additional aid may be offered to the student after he or she withdraws.
- If aid already disbursed is greater than earned aid, UW and/or the student must return some federal funds.

To determine whether federal funds have been earned or must be returned, UW follows this procedure:

1. Determine the percentage of the term the student completed. This is calculated by dividing the number of calendar days (including weekends) in a term into the number of calendar days that the student was in attendance for that term.
2. Apply the percentage of time attended to the total amount of federal aid the student was eligible to receive for the term. This is the student's "earned aid."
3. Subtract the amount of earned aid from the amount of aid actually disbursed to the student. A positive remainder is the student's "unearned aid." A negative remainder is the student's "earned aid" that may still be offered to the student.
4. Determine the amount of unearned aid remaining that must be repaid by the student. Subtract the amount of unearned aid repaid by the institution from the total amount of unearned aid.

All unearned aid will be returned to the federal student loan lender or federal aid accounts in the following order: (1) Unsubsidized Federal Direct Loan; (2) Subsidized Federal Direct Loan; (3) Federal PLUS (Parent) Loan; (4) Federal Pell Grant; (5) ACG-Smart; (6) Federal SEOG Grant. Any amount owed by the student on a grant will be reduced by 50%.

The date of a student's withdrawal from UW will be the date of the student's notification to the Dean of Students Office of an intent to withdraw if the student has no federal aid. For students who have received federal aid, the withdrawal date will be the last date of an academically related activity as reported by their instructors. When a student fails to officially withdraw from UW and has all F's at the end of the semester, the withdrawal date will be the latest date of an academically related activity as reported by their instructors.

UW will repay the lesser of (1) the total amount of unearned aid or (2) an amount equal to the student's institutional charges multiplied by the percentage of unearned aid. "Institutional charges" is defined as charges for tuition and fees, plus room and board charges for students living in UW residence halls and apartments. It does not include such charges as bookstore charges, student health insurance premiums, parking citations, or library fines.

The amount of unearned aid owed by the student on a loan may be repaid under the normal repayment terms of the loan. The amount of unearned aid owed by the student on a grant must be repaid immediately.

Any amount of earned aid not yet disbursed to the student will be offered to the student. Such offers will cover any undisbursed grants first, followed by the undisbursed loans.

Examples of how the amount of unearned federal aid a student must return is calculated are available from a professional adviser in the Office of Scholarships and Financial Aid. A chart detailing the percentage of earned and unearned aid, by calendar day of the semester, is provided in the term's class schedule. In brief, to determine the percentage of earned federal aid, the calculation will use the total number of calendar days in the term divided by the total number of calendar days the student attended.

Funds Distribution

Each student who registers has his or her own student account with the university. Once a qualified student has registered for classes and accepted their awards on WyoRecords, the Office of Scholarships and Financial Aid will authorize the electronic transfer of funds from UW financial aid accounts to the student's individual account at the university.

First-time borrowers of federal student loans must participate in entrance loan counseling (view a web presentation). All student loan borrowers must participate in an exit loan interview (on the web) prior to leaving UW.

Federal Work-Study funds are paid as payroll checks or direct deposit on the 15th and last working day of the month. Payroll checks may be direct deposited or mailed to the student.

The university will automatically charge a student's account for tuition and fees based on the student's enrollment. Likewise, if the student is living in a university residence hall, room and board charges will be placed on the student's account.

Any financial aid credited to a student's account will automatically pay tuition and fees first and then charges for room and board in UW residence halls. Unless directed otherwise in writing by the student, any remainder will be applied to other university charges. If a negative balance results, a credit balance will be prepared by the university and will be refunded to the student through the University's electronic refunding process.

Scholarships awarded for the academic year will be split into two equal payments to the recipient's student account with one to be paid at the beginning of each semester. Most non-UW scholarships are paid in the fall semester unless the donor or selection committee specifically directs that it be paid differently.

Students enrolled in a domestic or international exchange program or a study abroad program approved by UW for academic credit are eligible to apply for federal student financial assistance. Likewise, students concurrently enrolled in classes at two or more eligible institutions of post-secondary education may apply for federal aid. A special consortium agreement between institutions must be completed prior to each semester a concurrently enrolled student seeks aid. Those granted a Federal Work-Study allocation have opportunities to perform community services to earn their allocation.

Information describing available aid, award criteria, rights and responsibilities of aid recipients, costs of attendance or refund and repayment policies and schedules is available by writing to Office of Scholarships and Financial Aid, Dept. 3335, 1000 E. University Ave., Laramie, WY 82071, or viewing the financial aid web site at www.uwo.edu/SFA/.

Important: Students are assumed to be full-time when their initial financial aid is determined. If you plan to attend less than full-time in any semester, your financial aid will be adjusted to reflect your true tuition costs. It is always best to make the Office of Scholarships and Student Aid aware of your intended enrollment prior to the start of a semester so that accurate amounts of financial aid may be applied to your account.

Financial aid policies are subject to change without notice to reflect modifications in federal, state and institutional laws and regulations.

Veterans Educational Benefits

Students who have served in the armed forces may be allowed credit for courses taken in some military schools. Students who desire to apply for credit on the basis of the military schools should submit a copy of the DD-214 Form or its equivalent to the Office of the Registrar. Individual colleges will determine whether such courses will be applicable to degree programs.

All veterans seeking educational benefits must register with the veterans' certification specialist in the Office of Scholarships and Financial Aid, 174 Knight Hall, (307) 766-2525. This includes completing a veteran's registration card each semester.

Those veterans not completing a veteran's registration card by the last day of the late registration period will be dropped from VA educational assistance at the university. Class load requirements for veterans are as follows:

Undergraduate and Pharm.D. Veterans:

Full-time	12 or more credit hours
3/4 time	at least 9, but fewer than 12 hours
1/2 time	at least 6, but fewer than 9 hours
Less than 1/2	registration credit hour fee reimbursement only

Graduate and Law Veterans:

Full-time	9 or more graduate credit hours or certification by the Office of the Registrar*
3/4 time	at least 7 but fewer than 9 graduate credit hours or certification by the Office of the Registrar*
1/2 time	at least 4.5, but fewer than 7 graduate credit hours
Less than 1/2	registration credit hour fee reimbursement only

*The final responsibility for seeing that the veterans' certification specialist has a certification from the Office of the Registrar rests with the student. It must be received by the last day of scheduled registration.

If any portion of a veteran's schedule is composed of courses which are less than the full semester in length (i.e., short courses, workshops, "blocked" courses, etc.), the rate of benefit payment may be affected. If you have any questions or concerns, contact the veteran's certification specialist in the Office of Scholarships and Financial Aid, 174 Knight Hall, (307) 766-2525.

Withdrawal from a class or classes could reduce a veteran's benefits for that term. For details, contact the veteran's certification specialist in the Office of Scholarships and Financial Aid.

National Guard Benefit

Active Wyoming National Guard members in good standing and considered to be satisfactory participants may apply to participate in the Guard's Education Assistance Plan. The Plan provides 100 percent tuition and mandatory fee payment for all courses (except repeated courses) leading to one degree at UW, as long as the recipient continues to meet academic and service commitment requirements. Recipients must agree to serve in the Guard for at least two years after earning their degrees. This benefit may be used concurrently with Veterans Educational (GI Bill) Benefits. For information and application packets, please contact the Wyoming National Guard at 800-832-1959, ext. 5262, or the VA Certification Specialist at (307) 766-2525.

Tuition and Fees

Semester Tuition and Fee Schedule 2020-21 (subject to change)

The University of Wyoming semester tuition and fee schedules for the 2020-21 academic year, which begins with fall semester 2020, will be available in the Fee Book at <http://www.uwyo.edu/administration/financial-affairs/feebook/> or from Student Financial Services, Room 172, Knight Hall. Fall charges will post to accounts in WyoRecords by the end of July.

Summer school tuition and fees will be published in the *Summer Bulletin*.

Full-time undergraduate refers to undergraduate students enrolled for 12 or more hours, and part-time undergraduate refers to undergraduate students enrolled for less than 12 hours. At the graduate level, 9 or more hours is considered full time and less than 9 hours is classified as part time. Fees do not include special fees.

Student Benefit Package and Insurance

At the beginning of each semester, the part-time student benefit package will be added to student accounts of all part-time students (6 through 11.5 credit hours for undergraduates and 4.5 through 8.5 credit hours for graduate students) who have elected to purchase UW health insurance. The benefit package allows part-time students the same benefits as full-time students including, but not limited to, the use of Student Health Service, Half Acre Gym and the opportunity to apply for short-term emergency student loans.

Graduate students taking less than 4.5 credit hours should contact their academic department and also refer to the “Graduate Student Optional Fee Package Petition” document, which may be found on the Office of the Registrar website.

Students not assessed insurance who would like to purchase the benefit package, not for full-time status purposes, can fill out a form in Student Financial Services, 172 Knight Hall, and then pay for the package at the Cashier’s Office, 170 Knight Hall, or online.

Student medical insurance is mandatory for international students. International students are automatically enrolled in the medical insurance every fall and spring semester that they enroll in classes. Students may potentially waive this requirement if they meet university regulations and provide the necessary documentation by the add/drop deadline. Students are not eligible for student health insurance if they are online only.

Each domestic enrolling student will be required, as part of the registration process, to make a Student Medical Insurance selection. If the eligible student selects “YES” to the question, the premium will be assessed on the student’s account. If the student selects “NO,” they will not be assessed for the premium. Part-time students who select yes for the health insurance will also be assessed for the Part-time Student Benefit Package.

Domestic students are eligible for insurance if they are enrolled in at least 6 hours for undergraduate or 4.5 hours for graduate students. Students are not eligible for student health insurance if online or remote only.

For questions regarding the Student Medical Insurance program, contact the Student Medical Insurance Advocate (248 Knight Hall) at (307) 766-3025.

Tuition and Fee Payment 2020-21

All university charges are due by September 1 (Fall), February 1 (Spring), and June 1 (Summer).

An institutional Payment Plan is available for students who need extra time paying.

A non-refundable \$50.00 payment plan enrollment fee is charged per semester to all students that are not paid in full by the the payment dates above. The payment plan adds three monthly installments in addition to the first due date above. These are due on the 1st of two subsequent months. Registration holds and interest of 1.5% per month may be charged on all past due amounts.

Special Course Registration Fees

Additional charges (special course, college, advising, and program fees) must be paid by students enrolling in those courses and colleges with approved special fees. Fees for these courses and colleges will be indicated in the semester Class Schedule. Program fees, assessed to all courses under 5000 level, are by the college in which the course is held and may be different than a student’s primary program.

Tuition Waivers

If an employee, spouse of an employee or cooperating agency waiver is used for payment of tuition and/or fees, the properly completed and signed waiver must be received by the Student Financial Services office by the first day of the term. All waivers will be applied to accounts after the drop deadline. To be eligible for the waiver, the student (or spouse of student is utilizing spousal waiver) must be a benefited employee by the first day of class.

Financial Holds

A student failing to pay fees, charges, fines, penalties, deposits or short term loans as prescribed by the Trustees of the University of Wyoming shall be denied registration at the university and copies of academic transcripts and/or diplomas until such fees, charges, fines, penalties, deposits or short term loans are paid in full. A ten-day wait is required before a student loan hold can be removed if the debt is paid with a personal check. Contact Student Financial Services in Knight Hall for information regarding financial holds.

If a payment is made on a student account and the payment is returned to the University as a result of insufficient funds or otherwise, the student will have a hold on their account until the return payment fee in addition to the original amount is paid. Registered classes secured by a returned payment are subject to cancellation.

Summer Session 2021

Please refer to the 2021 *Summer Bulletin* for rates and applicable deadlines.

Refunds/Cancellations

Tuition and course fees will be canceled or refunded to a student who officially drops a class or classes, withdraws from the university through the Dean of Students office, or changes enrollment status (i.e. non-resident to resident; full-time to part-time) in accordance with the institutional refund policy outlined below.

No tuition penalty will be assessed for dropping and adding during the drop period identified in the term's class schedule unless all classes are dropped. Students who withdraw from individual courses after the end of the drop/add period will have their charges canceled in accordance with the institutional refund policy outlined below.

Mandatory fees, late registration fees, or service fees are not refundable.

The portion of tuition refund/cancellation is computed from the first day of the term, not class meeting pattern. If a student's initial registration includes blocked classes or short courses that begin at a later date, the refund/cancellation will still be computed from the first day of the term. If a student's initial registration occurs during an approved late registration period, the date for computing a refund/cancellation will be the first day of the term.

Institutional Refund Schedule

Before first day of semester	100%
Semester Class Day 1-8	100%
Semester Class Day 9-15	75%
Semester Class Day 16-20	50%
Semester Class Day 21-25	25%
Semester Class Day 26 on	0%

Examples of these calculations are available in Student Financial Services.

Interaction of Federal Return of Funds Policy and Institutional Refund Policy

When a student who receives federal financial aid withdraws from the university, he or she may owe a repayment of federal funds and/or be due a refund from UW or owe an additional amount to UW. For details on the application of these policies to a specific situation, please consult with Student Financial Services, 172 Knight Hall, (307) 766-6232.

Student WyoOne ID Cards

167 Information Technology Center, (307) 766-5268

ID cards are issued to all students during their first semester of enrollment. These cards are used throughout the student's entire career at the university.

The ID card, also referred to as the WyoOne card, is needed to pick up transcripts, financial aid, cash checks, access student health services, attend athletic events, enter recreation facilities, check out library books and materials, food service access, enter residence halls, and other necessities. Visit the online card office at www.uwyo.edu/idoffice/ to make deposits, view transaction history, and access other card management features.

The WyoOne card may also be used as a debit card to make purchases at some locations on campus after the deposit account is established. Spouses, domestic partners and dependents of students are eligible for an ID card.

Credit Available to Undergraduate Students

The University of Wyoming offers credit towards an undergraduate degree through:

I. University of Wyoming Credit

Instructed Classes

Courses are offered on campus and at distance settings around the state, including recognized academic courses under faculty general supervision such as internships, clerkships, clinical experience, co-op programs, etc.

Distance courses

Unlike some institutions, UW delivers courses at a distance through its mainstream academic departments, not through a separate academic unit. Academic department heads have the authority to assign instructors to distance-delivered courses, including online courses. They also have a responsibility to ensure that those courses are comparable in rigor and effectiveness to courses delivered face to face.

For this reason, when a department offers a UW course both face to face and at a distance, any UW student may satisfy any relevant university-, college-, and department-level requirements or elective credit by taking the course in either format.

Exceptions may arise when it is necessary to reserve space in a distance-delivered course for off-campus students, who can't take the face-to-face version. In these cases, departments may reserve spaces for off-campus students. But to the extent that spaces remain available after all interested off-campus students have enrolled, these spaces must be available to interested on-campus students.

Credit by Examination

An examination of an appropriate type and content for the credit sought may be conducted to determine if the applicant's proficiency is equivalent to that which could be expected upon completion of a college-level course in the subject. An applicant found to have this level of proficiency will be awarded credit for that course and allowed to proceed either with more advanced courses or with courses in other areas.

The use of credit by examination, or credit for prior learning, in graduate programs is not allowed.

Information concerning credit by examination can be obtained by contacting the Office of the Registrar.

Departmental Exams

While there is no maximum placed on the amount of credit earned by examination, credit so earned does not count in fulfilling the residency requirement of 30 hours of upper division University of Wyoming credit.

A student may not be allowed credit by examination in a course in which the student is currently or was previously enrolled either for credit or as a visitor or auditor, except that credit by examination may be used as a means to obtain credit for courses previously taken at institutions from which credit is nontransferable. A student may not challenge equivalent courses.

A student may not earn credit by examination in a course if the student has completed a course in the subject matter area above the level of the course for which the examination is sought. However, at the discretion of the departments involved, during the add/drop period a student may challenge a lower-level course while enrolled in a higher-level course in the same subject matter area, if the course challenged is a prerequisite for the course in which the student is currently enrolled.

If an examination exists, eligible students who pay the testing fee of \$80.00 may not be denied an examination in the introductory undergraduate course in any department. "Introductory course" is interpreted as that course which is prerequisite for successive courses in the department. Additional fees for examinations offered by testing agencies other than the University of Wyoming are determined by the agency concerned.

Grades of S or U (satisfactory/unsatisfactory) are given in all examinations. Credit by examination is not included in the student's grade point average; it is, however, included in the hours earned toward graduation. The grade of S is the equivalent of a C or better. See below for specific subject requirements. Entry on the student's academic record for credit by examination is made only if a grade of S is obtained and is noted as a grade obtained by examination.

To qualify for undergraduate credit, the student must be currently registered at the University of Wyoming as a degree candidate. The student must also be able to demonstrate to the satisfaction of the chair of the department involved that background experience has prepared him or her to attempt a challenge examination if such an examination is sought. The department chair's decision will be based upon existing departmental constraints such as accreditation, graduation requirements, and program requirements.

Other Options Include:

- Subject CLEP tests
- AP tests
- International Baccalaureate (IB)
- DSST

Students showing proficiency by passing examinations such as the College Board Advanced Placement Program (AP), for example, or examinations developed by University of Wyoming departments may earn college credit through the level of demonstrated proficiency. Credit may be allowed on the basis of any testing procedure acceptable to any department, which may include tests of the AP program and both the general and subject (specific) examinations of the College Level Examinations Program (CLEP).

Advanced Placement (AP) Information

Subject	Acceptable Score	UW Course Number(s)/Title(s), Semester Credit Hours
Art History	4+	ELEC 1000 (3)
Biology	4+	LIFE 1010 (4), General Biology
Calculus AB	3+	MATH 2200 (4), Calculus I
Calculus BC	3+	MATH 2200, 2205 (8), Calculus I and II
Chemistry	4+	CHEM 1020 and CHEM 1030 (8), General Chemistry I and General Chemistry II

Subject	Acceptable Score	UW Course Number(s)/Title(s), Semester Credit Hours
Chinese Language	4	CHIN 1010 (4), 1st yr. Chinese I
Chinese Language	5	CHIN 1010, 1020 (8), 1st yr. Chinese I and II
Computer Science A	4	COSC 1010 (4), Intro to Computer Science I
Computer Science A	5	COSC 1010, 1030 (8), Intro to Computer Science I, Computer Science I
Computer Science Principles	3+	COSC 1100 (3), Computer Science Principles and Practice
Environmental Science	3+	ENR 1200 (4), Environment
European History	3+	HIST 1120 (3), Western Civ. II
French Language	3	FREN 1010 (4), 1st yr. French I
French Language	4	FREN 1010, 1020 (8), 1st yr. French I and II
French Language	5	FREN 1010, 1020, 2010 (12), 1st yr. French I, II, 2nd yr. French I
German Language	3	GERM 1010 (4), 1st yr German I
German Language	4	GERM 1010, 1020 (8), 1st yr. German I and II
German Language	5	GERM 1010, 1020, 2030 (12), 1st yr German I, II, 2nd yr. German I
Government and Politics	3+	POLS 0000 (3) (fulfills the US Constitution requirement; eligible to take the one-hour Wyoming Constitution exam)
Government Comp.	3+	ELEC 1000 (3), Transfer Credit Elective
Human Geography	4+	GEOG 1020 (3), Intro to Human Geography
Language & Composition	4+	ENGL 1010 (3), English Composition*
Latin Literature	3	LATN 1010 (4), 1st yr. Latin I
Latin Literature	4	LATN 1010, 1020 (8), 1st yr. Latin I, II
Latin Literature	5	LATN 1010, 1020, 2030 (12), 1st yr. Latin I, II, 2nd yr. Latin I
Literature & Composition	4+	ENGL 1010 (3), English Composition*
Macroeconomics	4+	ECON 1010 (3), Principles of Macroeconomics
Microeconomics	4+	ECON 1020 (3), Principles of Microeconomics
Music Theory	4+	MUSC 1030 (3), Music Theory I and MUSC 1035 (1), Aural Theory I
Physics 1	4+	PHYS 1110 (4), General Physics I
Physics 2	4+	PHYS 1120 (4), General Physics II
Physics B	4+	PHYS 1210 (4), College Physics I
Physics Mechanics	4+	PHYS 1210, 1220 (8), College Physics I and II
Physics Elec & Magnetism	4+	PHYS 1220 (4), Engineering Physics II
Psychology	4+	PSYC 1000 (3), General Psychology
Spanish Language	2	No credit, but student should contact department for possible placement in SPAN 1020
Spanish Language	3	SPAN 1010 (4), 1st yr. Spanish I
Spanish Language	4	SPAN 1010, 1020 (8), 1st yr. Spanish I, II

Subject	Acceptable Score	UW Course Number(s)/Title(s), Semester Credit Hours
Spanish Language	5	SPAN 1010, 1020, 2030 (12), 1st yr. Spanish I, II, 2nd yr. Spanish I
Spanish Literature and Culture	2	No credit but student should contact department for placement
Spanish Literature and Culture	3	SPAN 1010, 1020, 2030 (12), 1st yr. Spanish I, II, 2nd yr. Spanish I
Spanish Literature and Culture	4+	SPAN 1010, 1020, 2030, and 2140 (15); 1st yr. Spanish I, II, 2nd yr. Spanish I, and Introduction to Readings
Statistics	3+	STAT 2050 (4), Fund of Statistics
Studio Art 2D	4+	ELEC 1000 (3)
Studio Art 3D	4+	ELEC 1000 (3)
Studio Art Drawing	4+	ELEC 1000 (3)
U.S. History	4+	ELEC 1000 (6)
World History	4	HIST 1330 (3), World History from 1450
World History	5	HIST 1330, 1320 (6), World History to 1450 and from 1450

*Credit is available for either Language and Composition or Literature and Composition.

College Level Examination Prep (CLEP)

Subject	Acceptable Score	UW Course Number(s)/Title(s), Semester Credit Hours
American Government	50 or above	POLS 0000 (3), (fulfills US Constitution requirement, eligible to take the one-hour Wyoming Constitution exam)
Analyzing and Interpreting Literature	50 or above	ELEC 1000 (3)
Biology	50 or above	LIFE 1010 (4), General Biology
Introductory Business Law	50 or above	MGT 1040 (3)
Calculus	50 or above	MATH 2200 (4), Calculus I
Chemistry	50 or above	CHEM 1020 and CHEM 1030 (8), General Chemistry I and General Chemistry II
College Algebra	50 or above	MATH 1400 (3), College Algebra
Financial Accounting	50 or above	ACCT 1010 (3), without USP
French Language	41 to 49	FREN 1010 (4), 1st yr. French I
French Language	50 to 56	FREN 1010, 1020 (8), 1st yr. French I and II
French Language	57 or above	FREN 1010, 1020, 2030 (12), 1st yr. French I, II, 2nd yr. French I
German Language	40 to 47	GERM 1010 (4), 1st yr. German I
German Language	48 to 53	GERM 1010, 1020 (8), 1st yr. German I and II
German Language	54 or above	GERM 1010, 1020, 2030 (12), 1st yr. German I, II, 2nd yr. German I
History of the U.S. I	50 or above	HIST 1210 (3), United States History I
Humanities	50 or above	ENGL 2130 (3) Creative Impulse
Information Systems and Computer Applications	50 or above	COSC 1200 (3) Computer Information Systems
Intro to Educational Psychology	47 or above	3 hours of general elective credit
Pre-Calculus	50 or above	MATH 1450 (5), Algebra & Trigonometry
Principles of Management	50 or above	MGT 3210 (3), Management & Organization

Subject	Acceptable Score	UW Course Number(s)/Title(s), Semester Credit Hours
Principles of Marketing	50 or above	MKT 3210 (3), Intro to Marketing
Principles of Macroeconomics	50 or above	ECON 1010 (3), Principles of Macroeconomics
Principles of Microeconomics	50 or above	ECON 1020 (3), Principles of Microeconomics
Introductory Psychology	50 or above	PSYC 1000 (3), General Psychology
Social Sciences and History	50 or above	ELEC 1000 (3)
Spanish Language	41 to 49	SPAN 1010 (4), 1st yr. Spanish I
Spanish Language	50 to 53	SPAN 1010, 1020 (8), 1st yr. Spanish I and II
Spanish Language	54 or above	SPAN 1010, 1020, 2030 (12), 1st yr. Spanish I, II, 2nd yr. Spanish I
Introductory Sociology	56 or above	SOC 1000 (3), Sociological Principles
Western Civ. I	50 or above	HIST 1110 (3), Western Civilization I
Western Civ. II	50 or above	HIST 1120 (3), Western Civilization II

DANTES Standardized Subject Tests (DSST)

Subject	Acceptable Score	UW Course Number(s)/Title(s), Semester Credit Hours
General Anthropology	50 or above	ELEC 1000 (3)
Art of the Western World	50 or above	ELEC 1000 (3)
Civil War and Reconstruction	47 or above	3 hours upper-division elective credit
Criminal Justice	46 or above	3 hours general elective credit
Environment and Humanity	46 or above	3 hours of general elective credit
Ethics in America	50 or above	ELEC 1000 (3)
Here's to your Health	400 or above	PEAC 1001 (3) lecture component; must complete activity for USP P credit
History of the Vietnam War	53 or above	HIST 1220 (3) US History II
Human/Cultural Geography	48 or above	GEOG 1020 (3) Introduction to Human Geography
Human Resource Management	46 or above	3 hours general elective credit
Introduction to Business	400 or above	3 hours general elective credit
Introduction to Computing	400 or above	3 hours general elective credit
Introduction to World Religions	50 or above	RELI 1000 (3), Introduction to Religion
Lifespan Development Psychology	50 or above	3 hours general elective credit
Management Information Systems	400 or above	3 hours general elective credit
Organizational Behavior	46 or above	3 hours general elective credit
Money and Banking	48 or above	3 hours general elective credit
Personal Finance	46/400	3 hours general elective credit

Physical Geology	46 or above	3 hours general elective credit
Principles of Finance	400 or above	3 hours upper-division elective credit
Principles of Financial Accounting	50 or above	ACCT 1010 (3) no USP credit
Principles of Physical Science	47 or above	3 hours general elective credit
Principles of Public Speaking	47 or above	3 hours general elective credit
Principles of Supervision	400 or above	3 hours general elective credit
Rise and Fall of the Soviet Union	49 or above	3 hours upper-division elective credit
Statistics	48 or above	STAT 2070 (4), Intro to Statistics for Social Sciences
Substance Abuse	49/400	3 hours upper-division elective credit

International Baccalaureate (IB)

Subject	Acceptable Score	UW Course Number(s)/Title(s), Semester Credit Hours
Adv. Math SL	4+	MATH 2200, 2205 (8), Calculus I and II
Social/Cultural Anthropology HL	4+	ANTH 2200 (3), World Culture
Social/Cultural Anthropology SL	4+	ANTH 1200 (3), Intro to Cultural Anthropology
Art/Design HL	4	ART 1000 (3), General Art Studio ART 1010 (3), General Art History
Biology HL	4+	LIFE 1010 (4), General Biology
Biology SL	4+	LIFE 1010 (4), General Biology
Business & Management HL	4+	MGT 2000 (3), Introduction to Business
Business & Management SL	4+	MGT 2000 (3), Introduction to Business
Chemistry HL	4	CHEM 1020 (4), Gen. Chemistry I
Chemistry HL	5+	CHEM 1020 (4), Gen. Chemistry I CHEM 1030 (4), Gen. Chemistry II
Chemistry SL	5+	ELEC 1000 (4), Physical Science Elective, USP SP
Computer Science HL	4+	COSC 1010, 1030 (8), Intro to Computer Science I and II
Computer Science SL	4+	COSC 1010 (4), Intro to Computer Science I
Economics HL	4+	ECON 1000 (3), Global Econ. Issues
Economics HL	5+	ECON 1010(3), Principles of Macroeconomics; ECON 1020 (3), Principles of Microeconomics
Economics SL	4+	ECON 1000 (3), Global Econ. Issues
English HL	4+	ELEC 1000 (3), USP Credit for WA/C1
Environmental Systems and Societies	4+	ENR 1200 (4), Environment
French Language	4	FREN 1010 (4), 1st yr. French
French Language	5	FREN 1010, 1020 (8) 1st yr. French I and II
French Language	6/7	FREN 1010, 1020, 2030 (12), 1st yr. French I, II, 2nd yr. French I
German Language	4	Germ 1010 (4) 1st yr. German I
German Language	5	Germ 1010, 1020 (8), 1st yr. German I and II

Subject	Acceptable Score	UW Course Number(s)/Title(s), Semester Credit Hours
German Language	6/7	GERM 1010, 1020, 2030 (12), 1st yr. German I, II, 2nd yr. German I
History - American HL	4	HIST 1210, 1220 (6), US History I and II
History-European	4+	ELEC 1000 (3), Cultural Context Social Science
History - Africa HL	4+	ELEC 1000 (3), Transfer Credit Elective
History - Asia and Oceania HL	4+	ELEC 1000 (3), Transfer Credit Elective
History - Europe and the Middle East HL	4+	ELEC 1000 (3), Transfer Credit Elective
Information Technology/Global Awareness	4+	ELEC 1000 (3), Global Awareness
Macroeconomics, Principles of	6/7	ECON 1010 (3), Principles of Macroeconomics
Math SL	4+	MATH 1450 (5), Algebra & Trigonometry
Math HL	4	MATH 2200, 2205 (8), Calculus I and II
Math Studies	4+	UNST Q (3), Quantitative Reasoning I
Music HL	4	Music 1000 (3), Intro to Music
Music Theory SL	4+	Music 1000 (3), Intro to Music
Philosophy HL	4+	3 hours of general elective credit
Physics HL	4	PHYS 1110, 1120 (8), General Physics I and II
Psychology HL	4+	PSYC 1000 (3), General Psychology
Psychology SL	4+	PSYC 1000 (3), General Psychology
Spanish Language	4	SPAN 1010 (4), 1st yr. Spanish I
Spanish Language	5	SPAN 1010, 1020 (8), 1st yr. Spanish I and II
Spanish Language	6/7	SPAN 1010, 1020, 2030 (12), 1st yr. Spanish I, II, 2nd yr. Spanish I
Theory of Knowledge	B or A	3 hours of ELEC 1000 credit
Performance/Theatre Prod. HL	4+	THEA 2050 (3), Theatre Practice
Visual Art SL	4	ART EL (6), Art Elective, USP CA
Visual Art HL	4	ART EL (12), Art Elective, USP CA
World Religions	4+	RELI 1000 (3), Introduction to Religion

Portfolio Evaluations

In recognition of factors in our society that produce great individual differences in backgrounds and preparation of students entering the university, the university has developed various options to assess extra-institutional college-level learning. To qualify for undergraduate credit, the student must be currently registered at the University of Wyoming as a degree candidate.

Credit based on faculty evaluation of the kinds and extent of college-level learning which an applicant has acquired in prior extra-institutional settings, evidenced in a portfolio of documentation, may count toward university undergraduate graduation requirements. In such event, the student's degree program can be enriched by freeing time needed to take additional courses, or accelerated to earn the baccalaureate degree earlier and commence postgraduate studies sooner.

The number of credit hours able to be earned by means of a portfolio evaluation is normally limited to 12. Such credit, when awarded, shall be for specific University of Wyoming content-oriented courses (rather than given as X number of hours of credit in a general discipline area), following the college course model of assessment as defined by the Council for Adult and Experiential Learning. Portfolio assessment, when used, will be conducted by a committee of appropriate tenured faculty including at least one member with the academic rank of professor. *All credit assigned for experiential learning based upon portfolio evaluations is excluded from the minimum credit hour requirements as set forth in the university requirements.*

II. Transfer Credit

Transfer credit includes college courses accepted from other regionally-accredited colleges or universities. Such course work must be considered equivalent or comparable to course work required by the University of Wyoming. The university accepts only academic courses in the study of religion similar to those offered by the Religious Studies Program in the College of Arts and Sciences.

Students transferring to UW must have the registrar or records office of the previous school(s) send an official transcript to the University of Wyoming Admissions Office. Once all final transcripts have been received by the Admissions Office, the degree analysts in the Office of the Registrar will create an electronic record of all courses that transfer to UW.

Evaluations are not accomplished for students working toward a Second Bachelor's Degree or those admitted as non-degree seeking. Second Bachelor's students should consult with their adviser concerning the applicability of transfer work to their UW degree program.

The recording of credit does not automatically imply acceptance toward a degree since degree requirements vary from major to major. Questions concerning the transferability of course work from other institutions should be directed to the Office of the Registrar.

Nontraditional credits awarded by another institution will not normally be accepted by the University of Wyoming. They may be validated by departmental exam within the faculty regulations allowing for such examinations.

a. UW Policy (Academic Affairs Policy Letter, October 9, 2012)

UW maintains a system for accepting transfer credits from other institutions and prides itself on forward-looking approaches to distance education. The following clarifies policies for:

- Accepting transfer credit from Wyoming's public community colleges
- Accepting transfer credit for students transferring to UW from other institutions
- Accepting transfer credit for students enrolled at UW

1. Transfer credit from Wyoming's public community colleges

UW generally accepts credit earned at any Wyoming public community college in accordance with the Wyoming Transfer Catalog. This policy applies to students transferring to UW and to students enrolled at UW who take courses at one of these community colleges while they pursue degrees at UW. It does not apply to FYS credit earned by students who earned concurrent enrollment FYS credit or students transferring with less than 30 semester hours.

UW maintains an active regimen of institution-wide and discipline-specific articulation with Wyoming community colleges. These discussions, together with department-driven decisions about which courses to list in the statewide common course-numbering system, provide mechanisms that can ensure appropriate levels of course equivalency.

2. Transfer credit for students transferring from other institutions

The UW Office of the Registrar (OTR) maintains a list of course equivalencies and courses accepted for general credit from other institutions of higher learning. In maintaining this list, the OTR, in consultation with academic departments as necessary, determines which outside courses:

- are equivalent to specific UW courses
- count for general university-level credit
- are not transferable for university-level credit

For courses beyond the 1000-2000 level and in cases where questions arise, the OTR relies on academic departments to assist in the assessment.

For any student transferring to UW from another institution of higher learning, UW will adhere to the OTR's equivalencies on the date that the transcript is evaluated. If a course in question has not previously been articulated, the OTR will follow the normal protocol to make a determination. If an academic department determines that an outside course has been improperly articulated, the OTR will correct the equivalency. The corrected equivalency will apply to subsequent transfer students but not retroactively.

3. Transfer credit for students enrolled at UW

The university's faculty and administration expect UW students to earn credits by taking courses at UW. Exceptions may be appropriate in some instances. For example, the university encourages students to pursue opportunities to study abroad, whether through UW course offerings or through other approved programs. As another example, a student who spends a summer in another university town may also have a compelling case for taking a non-UW course and applying the credits to the UW transcript. There are many other possibilities.

For any student enrolled at UW, the university will guarantee transfer credits only for courses for which the student has received prior, course-specific approval from the Office of the Registrar. A Transfer Evaluation Form should be submitted prior to enrolling for a transfer course.

The only exceptions are transferable credits from Wyoming community colleges, as discussed above. In considering requests of this type, academic department heads may take into account the student's circumstances, department, and university-level learning outcomes such as global awareness, and the department faculty's assessment of the course's content, level, and academic rigor.

This policy has no effect on such programs as WICHE's Internet Course Exchange and other inter-institutional arrangements through which courses taught elsewhere count as credit-bearing UW courses.

b. Process

Transfer credit includes college courses accepted from other accredited colleges or universities. Such course work must be considered equivalent to course work required by the University of Wyoming. Students transferring to UW must have the registrar or records office of previous school(s) send an official transcript to the University

of Wyoming Admissions Office. Once all final transcripts have been received by the Admissions Office, the degree analysts in the OTR will create an electronic record of credit transferred.

The recording of credit does not automatically imply acceptance toward a degree since degree requirements vary from major to major. Questions concerning the transferability of course work from other institutions should be directed to the Office of the Registrar.

c. Articulation: Earned Associate Degrees

1. Wyoming Community Colleges

Students entering UW beginning Fall 2001 who have completed an AA, AS, ADN, or AB degree from a Wyoming Community (spring 2001 or later) College receive credit toward completion of the lower division general education requirements included in the University Studies Program with the exception of the US/WY Government and Constitutions requirement. Students with an eligible associate's degree who have not completed both components of the US/WY Government and Constitutions requirement must complete it with coursework or challenge exam.

This policy applies to graduates receiving an Associate of Arts, and Associate of Sciences, Associate Degree Nursing, or an Associates of Business degree from any of the seven Wyoming Community Colleges. All graduates with an AA, AS, ADN, or AB degree complete a minimum of 64 college-level credits with a minimum of 2.000 GPA.

2. Community College Articulation: effective spring 2012

Graduates of regionally-accredited Colorado community colleges earning an AA/AS Spring 2012 or later are awarded the lower-division general education core in the same manner as graduates of Wyoming community colleges, with the exception of the US/WY Government and Constitutions requirement. Students must complete the Wyoming component through coursework or challenge exam. Spring 2008 (and later) graduates of Pikes Peak Community College are included due to a pre-existing articulation agreement.

Spring 2012 and later AA/AS graduates of Western Nebraska, Mid-Plains (Nebraska), and Colby (Kansas) Community Colleges will be extended the lower-division general education core in the same manner as Colorado schools above.

3. Community College Articulation: effective spring 2015

Graduates of regionally-accredited institutions earning an AA/AS/AB Spring 2015 or later are awarded the lower-division general education core in the same manner as graduates of Wyoming community colleges, with the exception of the US/WY Government and Constitutions requirement. Students must complete the Wyoming component through coursework or challenge exam.

Transfer Credit from Regionally-Accredited U.S. Colleges and Universities

The Wyoming Transfer Catalog is a searchable online database of courses which the University of Wyoming has previously articulated from regionally-accredited U.S. institutions. Coursework may transfer in as equivalent, elective or NA. Elective coursework may be a general elective, academic department specific elective and/or elective with University Studies (USP) credit. Transfer courses which return values of "NA" in the UW Subject field are considered to be not transferable to UW. All new classes are evaluated on an individual basis. All new

upper-division courses are initially given upper-division general elective credit; University faculty may then evaluate an upper-division course for direct UW equivalency transfer credit.

UW operates on semester credit; credit is awarded credit hour for credit hour. Quarter hours are recognized as two-thirds (2/3) of a semester hour.

Academic advisors may submit an elective course to fulfill a major or curricular requirement. Elective courses may also be considered for University Studies requirements via the University Studies Petition process.

Students intending to transfer to UW are encouraged to meet with advisors and review both the Wyoming Transfer Catalog and the UW Catalog when planning their program of study to ensure courses taken elsewhere will transfer to UW as intended for their desired major. Final determination of transfer credit acceptance is made by the University Registrar and faculty. Students must submit official transcripts of all completed coursework before a final determination can be made on credit transfer.

These equivalencies are subject to change without notice.

d. Transfer Credit for Study Abroad

Study abroad coursework is evaluated based off the documentation provided by the student and what is available to the Office of the Registrar. It is the students' responsibility to review the transfer work and to provide any course documentation (syllabi, descriptions, sample course work) to the Office of the Registrar. Once the transcripts received from the study abroad experience have been evaluated, students will have one year from that date to make any appeals or changes to what was initially awarded. Requests for changes to transfer credit awarded through study abroad following one year of the initial review will not be processed.

III. Military Service Courses

Students who have served in the Armed Forces may be allowed transfer credit for courses taken in some military schools. Students who desire to apply for credit on the basis of their military schooling should submit a copy of their DD-214 form or AARTS/SMART/CCAF transcript (or equivalent) to the UW Admissions Office. The degree analysts in the Office of the Registrar determine whether the course work is transferable to UW. Evaluations for the granting of credit for military-based training are based on recommendations in the American Council of Education (ACE) guidelines. Individual colleges will determine whether such course work is applicable to their degree programs.

The Grading System

Students are evaluated according to the following grading system:

Grade	Pts.	Definition
A	4.000	Exceptional
B	3.000	Very good
C	2.000	Fair
D	1.000	Poor
F	0.000	Failure (may be assigned as a grade for failure to attend or to indicate failure to formally withdraw)
I		Incomplete (temporary mark pending coursework completion as agreed in a signed document). See section on incompletes below for details.
W		Withdrawal (from the individual course or all courses), only if the student follows the official withdrawal procedure. If a student enrolls in a course and then abandons it (stops attending) without following the official withdrawal procedure, a grade of F will be assigned.
S		Satisfactory (equivalent to a C or better [B or better in courses numbered 5000 or above]; see general information on S/U grading below)
U		Unsatisfactory (see general information on S/U grading below)
UK		Unable to compute grades (for midterm grades only)

Grade Points

Each letter-graded course carries a grade point value computed as: the total credit hours earned in the course multiplied by the point value of the letter grade earned. For example: a student earning an A (point value of 4) in a 3 credit-hour course would earn 12 grade points for the course.

Semester (or Term) Grade Point Average

The semester grade point average (GPA) is the sum of all grade points earned in a semester or term divided by all credit hours attempted for letter grade. Credit hours in courses in which marks of I, W, S, or U were assigned, as well as developmental courses, are excluded.

Cumulative Grade Point Average

The average of all grade points earned by a student below is termed the cumulative grade point average. It is used for determining activity eligibility, honors, probation, suspension, graduation, and for all comparisons or purposes requiring measurement of academic standing.

The cumulative grade point average is defined as the sum of all grade points earned in University of Wyoming residence, correspondence, or Distance Education, divided by all credit hours attempted for letter grade, with the following exceptions:

1. The credit hours shall not be counted in courses in which marks of W, S, or U were assigned, or in which marks of I (for incomplete) are still in effect.
2. For repeated courses:
 - a. First repeat: only the second credit and grade is used to determine earned hours and to calculate the cumulative grade point average.
 - b. If repeated more than once, only the last credit and grade earned is used to determine earned hours and to calculate the cumulative grade point average.
 - c. A student is limited to a maximum of three (3) attempts, including withdrawals, in any course at the University of Wyoming.
 - d. If a mark of W, S, or U is assigned in a repeated course, the previous grade assigned will stand except when an S or U is earned repeating a previous S or U.
 - e. Courses applied towards one completed degree may be repeated as part of a second degree; however, the grade and grade point average in the original degree will not be changed.
3. Transfer grades are not counted in the UW grade point average. If a course taken at UW is repeated at another institution, the credits and grade earned at UW will be deleted from computation of the UW cumulative grade point average if credit for the repeated course is transferred to UW.
4. For graduate students, courses numbered below 4000 are not added in to the semester and cumulative totals, nor computed into the GPA.

Repeating a Course

Students may repeat course work; however, credit earned in any given course (or equivalent course) is applicable toward a degree requirement only once. All grade entries remain on the student's record, but only the last grade earned will be calculated in the UW cumulative grade point average. Refer to the Cumulative Grade Point Average section of this catalog for further information. Variable-credit courses are not considered as repeats unless the department head provides written certification that the course content was, in fact, repeated. Courses repeated will remain as entries on the academic transcript. Courses applied towards one completed degree may be repeated as part of a second degree; however, the grade and grade point average in the original degree will not be changed. A student is limited to a maximum of three (3) attempts in any course at the University of Wyoming. An "attempt" includes any instance in which the student earns a grade for the course or withdraws from the course. The three-attempt limit does not apply to courses identified in the *University Catalog* as being appropriate for students to take multiple times. A student can petition for exceptions to this limitation through established university procedures (UW Regulation 2-204). See the University Regulations online for the most up-to-date version.

Incompletes (I)

A grade of “I” (incomplete) is a temporary grade assigned to students who, due to unforeseen circumstances, were unable to complete all work required for a course. Information regarding authorization and processing of incomplete grades may be obtained from the Office of the Registrar. An incomplete should not be assigned in lieu of a failing grade (e.g. if student never attended). Incomplete grades are not a student privilege. They can be issued only at the discretion of the assigned instructor. (UW Regulation 6-720) See the University Regulations online for the most up-to-date version.

Time allowed for completing course requirements will normally not exceed 120 calendar days beyond the end of the semester in which the I was given. The dean of a college may designate certain research courses where the 120-day limit may be extended by the instructor; however, the completion date even in these courses should not be later than the time of graduation for the student unless the student is reserving the particular course for graduate credit.

If the final grade for the course is not received in the Office of the Registrar by the date indicated on the authorization, the I will revert to an F. Should graduation occur in the interim, the I will stand permanently. The student’s GPA at graduation with all associated honors will stand as computed. (UW Regulation 6-720) See the University Regulations online for the most up-to-date version.

General Information on S/U Grading

The grade of S (satisfactory) is interpreted to include grades A through C and the grade of U (unsatisfactory) to include grades C through F on the conventional grade scale for courses numbered less than 5000 (for courses 5000 or above, the grade of S is interpreted to include grades A and B). Credit hours of S/U courses are counted as hours attempted toward graduation. However, neither the S nor U grade carries grade points and neither will be included in the calculation of the cumulative grade point average.

Students may not take a course for S/U credit to satisfy University Studies Program requirements, unless the course is offered for S/U only; (e.g., POLS 1000, or the equivalent history or economics courses, may not be taken for S/U).

If a mark of S or U is assigned in a repeated course, the previous grade assigned will stand except when an S or U is earned repeating a previous S or U.

Students must signify at the time of registration or schedule modification whether they are taking any course for S/U grades.

The faculties of the various colleges and interdisciplinary programs shall determine the number of credit hours of S that may be used to satisfy degree requirements in their programs. They may also place restrictions upon the use of S credits to satisfy college or major requirements. In addition, they may designate particular courses in their colleges as courses to be offered for S/U only.

A student who changes majors within a college or who transfers to a different college may petition for the acceptance of S credits previously earned if such credits are in conflict with faculty-established regulations for the new major or college.

Mid-Term Grades

Mid-term grades for all courses numbered below 5000 are to be submitted by instructors through WyoRecords the week following midsemester. Grades which can be assigned by faculty are:

Grade Definition

D	Poor
F	Failure (may also be assigned as a grade for failure to attend or to indicate failure to formally withdraw)
S	Satisfactory (equivalent to a C or better) in cases where the class is offered for S/U or the student has elected the S/U option
U	Unsatisfactory (equivalent to a D or F) in cases where the class is offered for S/U or the student had elected the S/U option
UK	Unknown; unable to compute grade

The UK grade may be assigned if, due to lack of performance assessments such as exams, papers, homework, etc., a faculty member is unable to make a determination of a midterm grade.

Please note that the midsemester grade received in any particular class reflects the assessment of student performance during the first portion of the semester only.

Mid-term grades are available through WyoRecords.

End of Semester Grade Reports

Final grades are available through WyoRecords as soon as possible (usually five working days) after the close of the semester or term.

At the end of the semester, final grades are available to students through WyoRecords within one day after being submitted by faculty. Final grades are due from faculty by noon (12:00 p.m.) of the fourth business day after the end of finals week (or after the last day of the summer semester).

Definitions

1. Cumulative semester hours attempted shall be the total of all credit hours attempted through the University of Wyoming, except for credit hours attempted in repeating a course, those in which marks of W were assigned, and those accepted in transfer from other institutions.
2. The cumulative grade point average is defined as the sum of all grade points earned through the University of Wyoming divided by the sum of all credit hours attempted through the university, except for credit hours in which marks of W, S, U, or I are assigned or those of an initial course which has been repeated. When a course has been repeated, only the last grade points and credit hours assigned for repeats of the course shall be entered in the computation of the cumulative grade point average.

Grade Appeal

A recorded grade may be changed through established appeal processes within individual colleges. Contact your department for further information about appealing a grade.

Academic Transcripts

Official transcripts of individual academic records at UW are sent from the Office of the Registrar upon written authorization signed by the individual. Individuals may also authorize the release of their academic transcripts through WyoRecords. All financial obligations to the university must be cleared before a transcript may be released or viewed on WyoRecords.

Transcripts are produced on a first-come, first-served basis and one to two business days must be allowed. Usually, 10-15 days are needed at the close of a semester to record semester grades. Same-day transcript service is available for a \$10 fee (limit of 2 transcripts).

Partial transcripts are not issued. Each transcript includes the complete academic record at the University of Wyoming and the number of credits from other institutions accepted by UW.

Official transcripts of credit earned at other institutions which have been presented for admission or evaluation of credit become the property of the University of Wyoming and are not reissued or copied for distribution. This includes high school records and any other type of supporting documents. Transcripts of work completed at other institutions should be obtained directly from the issuing institution.

Applicability of transfer credit toward any degree is dependent on the curriculum pursued by the student.

In preparing transcripts for graduate students or second bachelor's degree candidates whose undergraduate work was taken elsewhere, the University of Wyoming includes on its transcripts no detailed reference to that undergraduate work, mention being limited to designation of the degree and date received and the name of the institution granting the degree.

Honor Roll

Undergraduate and law students who achieve high scholastic grades are honored by being placed on the President's Honor Roll, the academic Dean's Honor Roll, or the Provost's Honor Roll.

The requirements to be met to attain these honors are:

For President's or Dean's Honor Roll:

1. Undergraduate students must complete a minimum of 12 UW semester hours on a basis of A-F. Exception: if a student is student teaching, the student must be enrolled in a minimum of 12 UW semester hours, at least 7 of which must be graded on the basis of A-F with no semester grade of I. Courses taken for audit do not count for honor roll purposes.
2. A GPA of 4.000 for the President's Honor Roll.
3. A GPA of 3.250 or better for the academic Dean's Freshman Honor Roll.
4. A GPA of 3.400 or better for the academic Dean's Honor Roll for undergraduates above freshman standing.
5. In the College of Law, students are eligible for the academic Dean's Honor Roll when enrolled in a minimum of 13 UW semester hours of law courses. In the College of Law, a grade point average of 3.250 or better is required for first year students and a GPA of 3.400 or better is required for second and third-year students for the academic Dean's Honor Roll.
6. Students having consortium agreements with other institutions are not considered to be full-time for honor roll purposes.

For the Provost's List:

1. Undergraduate students must complete a minimum of 6 UW semester hours, but fewer than 12 UW semester hours, of which at least 6 UW semester hours must be graded on the basis of A-F with no semester grade of I. Courses taken for audit do not count for honor roll purposes.
2. A GPA of 3.500 or better.

Graduate Students

Graduate Students are not eligible for the President's Honor Roll, the academic Dean's Honor Roll, or the Provost's List.

Academic Probation and Suspension

Undergraduate Students

Academic Status

In order to graduate, every student is expected to maintain satisfactory academic progress, which is based on scholastic performance. Current academic status will be indicated on internal documents and grade reports as:

- good standing
- academic probation
- academic suspension: normally not eligible to petition for reinstatement until one full semester, exclusive of summer term, has elapsed. The dean of the college in which a suspended person wishes to continue may waive the four-month delay if the dean is assured that the person has made suitable progress toward resolving the academic deficiencies.

Undergraduate Academic Probation

1. Academic probation shall constitute notice that a student is not progressing satisfactorily toward the bachelor's degree or Pharm.D.
2. A student enrolled at the University shall be placed on academic probation at the end of the semester or summer term when his/her cumulative GPA at UW falls below a 2.000.
3. A student placed on academic probation will be so notified by email. This information is also available on WyoRecords.
4. A student shall be removed from academic probation at the end of the semester or summer term in which his/her cumulative GPA is 2.000 or above.
5. Students who fail to remove themselves from probation or earn a semester grade point average below 2.000 in the next semester or summer term attempted at the University of Wyoming will be placed on academic suspension for not maintaining the criteria for satisfactory academic progress. For probation purposes, completing a semester or summer term shall mean that the student has earned a grade in at least one course.

Undergraduate Academic Suspension

1. Academic suspension is the dismissal of a student from the University due to the student not making satisfactory academic progress toward the bachelor's degree.
2. A student who is suspended for unsatisfactory academic performance should not be permitted to petition for reinstatement until one full semester, exclusive of summer term, has elapsed. Students may petition once per semester for reinstatement, and, if denied by any college or the Center for Advising and Career Services,

cannot petition for reinstatement until the next fall or spring semester, unless there are documented extenuating circumstances justifying immediate reinstatement.

3. A suspended student may not enroll for any University of Wyoming credit classes (including on-campus, online, and distance).
4. Credit earned at another accredited college or university while a student is suspended from the University may be accepted under the usual regulations governing the transfer of credit after the student has been reinstated.
5. A student placed on academic suspension will be so notified by letter.

Undergraduate Academic Reinstatement

1. A college may have an academic reinstatement policy that is more restrictive than the general university policy.
2. Academic reinstatement is the readmission of a suspended student to the University. The student is eligible to be considered for readmission. The reinstated student will be on academic probation during his/her first semester or summer term of reinstatement after which he/she may be removed from this probation.
3. A petition for reinstatement must be submitted no later than 15 days before the beginning of the semester or summer term in which the student wishes to register. A petition received after this deadline may not be processed until after the regular registration period.
4. The decision on a petition for reinstatement will be made by the dean (or designee) of the college in which the student wishes to enroll. Undeclared students should contact the Director of the Center for Advising and Career Services. A student who has been reinstated must remain in the college in which he/she has been reinstated for that semester.
5. Students placed on academic suspension are eligible for a maximum of three reinstatements. Any student placed on academic suspension for the fourth time is not eligible for reinstatement for a minimum of five years from the end of the last term of attendance.
6. Students who are suspended as a result of spring semester grades will have the suspension invoked at the beginning of the summer term.

Exceptions

Upon the request of a person placed on academic suspension or denied reinstatement, the vice president for academic affairs may review the circumstances and reverse the decision of the dean if the vice president for academic affairs deems it necessary to prevent a gross injustice.

Academic Renewal

An undergraduate student who returns to the University and who has not completed or withdrawn from a college course at UW during the previous five years will have the option of continuing his or her earlier UW cumulative GPA or commencing a new cumulative GPA under the Academic Renewal policy. The student must submit the Academic Renewal Application Form (which may be obtained from the Office of the Registrar) to the registrar no later than ten class days before the last day of classes of the semester in which the student returns to UW.

The entire UW transcript will remain intact. A note indicating the policy will precede the new part of the UW transcript if the student opts for academic renewal. At the discretion of the academic department in which the student is enrolled, credit hours for which the student earned the grade of C or better may be applied toward the completion of the degree requirements. The list of any departmentally-approved courses must be indicated on the Academic Renewal Application Form when initially submitted to the registrar. No further changes may be requested.

A student's GPA and completed courses that were applied to a baccalaureate degree are not eligible for academic renewal.

Graduate students are not eligible for academic renewal.

Graduate Students

A graduate student enrolled at the university will be placed on academic probation at the end of a semester or summer session when his or her graduate cumulative UW grade point average in 4000-level or higher courses is below 3.000. Students who fail to bring their graduate GPA to 3.000 and remove themselves from probation after one semester or summer session will be suspended from the university. A suspended student may petition his/her academic program for reinstatement to the same degree program. A reinstated student will be on probation and may be subject to other performance criteria as specified by the dean of the affected department.

The above GPA requirement is considered to be a minimum requirement. Individual departments or programs may require higher standards than these minimum performance standards and establish department- or program-specific criteria for satisfactory academic progress. A graduate student may be dismissed from a degree program for lack of satisfactory academic progress, as determined by the department or program offering the degree.

The above regulations governing academic probation, suspension, and reinstatement do not apply to students enrolled in the College of Law.

Registration and Enrollment in Courses

Registration Procedures

Eligible students can register, drop, add, and get a schedule of their courses through WyoRecords. To insure that students have seen an adviser, access numbers for each semester's registration are distributed through the academic advisers. Directions for registration are contained in the appropriate *Class Schedule*. *Class Schedules* are available online no later than one week prior to advising week. Students are responsible for following directions and deadlines contained in the *Class Schedules*.

The following categories of continuing students in good standing or on academic probation are eligible to register for the semesters indicated:

1. *For the fall semester:*

All students who were enrolled the previous fall, spring, or summer semester.

2. *For the spring semester:*

All students who were enrolled the previous spring, summer, or fall semester.

3. *For the summer session:*

Students who were enrolled the previous summer, fall, or spring semester.

All other applicants and students should complete admission requirements by the admission deadline. (Refer to the sections on undergraduate and graduate admissions in this catalog for deadlines.)

All information requested during admission and registration is important to the student and to the university and should be kept accurate and complete. If a student's address, telephone, major, adviser, or other vital information changes after enrollment, the Office of the Registrar should be informed without delay.

Academic Adviser

Academic advising is a decision-making process involving a partnership between the academic adviser and the student (advisee). In this partnership, issues and questions regarding personal, professional, and educational goals are examined and evaluated. This includes, but is not limited to, planning an appropriate course of study and the scheduling of classes.

The purpose of academic advising is to promote rational, informed, and independent choices by the student. To that end, the academic adviser is a significant link for the student to other resources in the university community. Students are expected to take the initiative in developing the adviser-advisee relationship and to assume an ever-increasing role in developing their own academic, career, and personal goals.

Change of Registration

Modification of a course schedule during the drop/add time period is accomplished through WyoRecords. After the end of the drop/add period, individual class withdrawals can be done by the students on WyoRecords. Changes to a student's registration or withdrawals are not official until the process is completed as prescribed.

The period of time allowed for modifying a student's schedule or withdrawing during the summer session or other special terms is established in regulations or by the registrar, subject to the approval of the vice president for academic affairs.

During the fall and/or spring semester(s):

1. *Dropping a class or changing sections:* A student may drop classes during the first eight class days of the semester (four class days for blocked courses).
2. *Adding a course or changing grading option:* A student may add classes, change sections, or change grading options or hours in variable-credit courses during the first four class days of the semester (two class days for blocked courses).
3. *Withdrawal from a course:* After the designated drop/add period, students may officially withdraw from individual regular term courses until fifteen class days after mid-semester (five days after the middle of the course for blocked courses). Withdrawing means that a non-punitive grade of "W" is assigned as the final grade for the class. Students considering withdrawing should contact the Student Financial Aid Office prior to withdrawing to fully understand how withdrawing will affect their aid and scholarships.

Students may withdraw from an individual course through their WyoRecords account. If a student has a hold on their account preventing them from withdrawing through WyoRecords, they may submit an online Class Withdrawal form available on the Office of the Registrar website. The online form is required for students who wish to withdraw from First Year Seminar classes.

Refunds for course withdrawal (when applicable) are based on the date the withdrawal is processed, not on submission of the online petition.

When a class has a status of "Indiv Course Withdrawal" on the "Add or Drop Classes" page in WyoRecords, the student has officially withdrawn. Students may also confirm that a final grade of "W" is noted on the transcript, which may be viewed through WyoRecords.

Unauthorized discontinuance of enrollment or unofficial abandonment of classes will result in a failing grade.

4. *All-School-Withdrawal (termination of enrollment):* Withdrawal from the university is the official termination of student status prior to the end of a fall or spring semester, but students may otherwise register for classes for the subsequent semester if they choose to do so. Students wishing to withdraw from all on-campus classes should initiate the procedure with the Dean of Students Office. Withdrawal from the university is not permitted during the last 15 days of a term. After clearing with the Dean of Students Office, the withdrawal form must be presented to the university cashier for initial processing. The Office of the Registrar will report withdrawals to instructors concerned. Students withdrawing from distance classes should send an email to the Office of the Registrar to initiate the process.

Choice of College and Major

The academic adviser is an excellent source of information about the adviser's professional field for students who have selected a major. Students who are undecided about the selection of a college and/or major and who seek specialized assistance in choosing educational and vocational objectives should contact the Advising, Career, and Exploratory Studies center. These units have programs designed to help the undeclared student acquire the tools to make an intelligent decision regarding an appropriate major discipline.

Change of College, Major, or Adviser

Students who wish to change their college, major, or adviser should obtain the appropriate form from either the Office of the Registrar or the office of the dean of the college of their current enrollment. Students wishing to transfer from one college to another must secure the signatures of both their present and future deans. Graduate students need the approval of the college dean and the head of the department to which the student is transferring. After all appropriate signatures have been obtained, the student should take the form to the Office of the Registrar.

Students who have completed their undergraduate work at the university and who wish to embark upon a graduate program, even through continuing their graduate work in the same field they pursued as undergraduates, will need to apply for graduate admission. (Refer to the section on graduate admission in this catalog for deadlines.)

Definitions for Student Classifications

Code	Class	Definition by earned semester hours
FR	Freshman	Under 30
SO	Sophomore	30 but less than 60
JR	Junior	60 but less than 90
SR	Senior	90 or more
GR	Graduate Student	
LW1	Law student (professional level) first year	
LW2	Law student (professional level) second year	
LW3	Law student (professional level) third year	
MD1	Medical student (professional level) first year	
PH1	Pharm.D. (professional level) first year (0-33 semester hours)	
PH2	Pharm.D. (professional level) second year (34-69 semester hours)	
PH3	Pharm.D. (professional level) third year (70-104 semester hours)	
PH4	Pharm.D. (professional level) fourth year (105+ semester hours)	

Credit Hour Load

Undergraduates: An average of 15 hours of coursework each semester is considered a normal load. Maximum credit loads are 20 hours in all colleges. Normally, not more than 12 hours of undergraduate credit may be taken during the summer session. An approved Overload Petition form must be filed to exceed these maximums. Overload Petition forms are available online or from the Office of the Registrar.

Graduate students: 14 hours of credit is the average and 16 hours the maximum amount of credit allowed per semester for full-time graduate students. A student who has been assigned an assistantship for the academic year is usually restricted to a load of 13 semester hours. Normally, not more than 8 hours of credit may be earned in course work during an eight-week summer session. An approved Overload Petition form must be filed to exceed these maximums. Overload Petition forms are available online or from the Office of the Registrar.

Auditing a Course

The privilege of non-credit enrollment in a class is available to any university student. The auditing privilege is subject to the same fee schedule as credit courses. Auditors are expected to attend class regularly and complete such graded work as required by the instructor. It is the responsibility of the student to determine and fulfill the requirements for a satisfactory audit. Though this auditing privilege carries full rights of class participation, it definitely offers no academic credit, does not count toward full- or part-time status, and will result in a mark of satisfactory (SA/S) or unsatisfactory (UA/U). Subsequent credit for the course by special examination is not available.

Graduate Credit for Seniors

Undergraduate students taking graduate-level courses which are not in any way a part of their undergraduate degree have the option of later using such courses for purposes beyond the bachelor's degree requirements. If the student intends to pursue a graduate degree or needs the courses noted on the academic transcript as reserved for graduate credit for job classification (e.g. advancement on teacher salary schedules) the student should file a petition. The Request to Reserve Coursework for Graduate Credit should be filed by midterm of the semester which is requested. The petition form is available on the Graduate Student Forms page on the Office of the Registrar website. Courses may not be retroactively reserved once a semester has ended.

Class Attendance

Each student shall attend the lectures, recitations, and laboratories, and participate in field work deemed necessary to adequately fulfill the academic requirements of each course. Each instructor, at the beginning of every semester, shall stipulate the attendance policy necessary for satisfactory completion of the course.

The Dean of Students Office may issue authorized absences for participation in university-sponsored activities and for other unusual circumstances. If students have been hospitalized, or if they have been directed by the Student Health Service or their private physician to stay at their place of residence because of illness, the Student Health Service or their private physician may issue a statement giving the dates of the student's confinement which the student may show to the instructor without verification from the Dean of Students Office. The Student Health Service has a policy not to provide medical excuses for missed classes. Please review the policy at <http://www.uwyo.edu/shser/medical-excuses.html>.

All instructors shall permit students who have official authorized absences to make up missed course work without penalty. An authorized absence, however, merely gives the individual who missed the class an opportunity to make up the work and in no way excuses him or her from the work required.

When a class has a status of "Indiv Course Withdrawal" on the "Register for Classes" page in WyoRecords, the student has officially withdrawn. Students may also confirm that a final grade of "W" is noted on the transcript, which may be viewed through WyoRecords.

Unauthorized discontinuance of enrollment or unofficial abandonment of classes will result in a failing grade.

Academic Dishonesty

Whatever form academic dishonesty may take, the university community regards it as a serious offense. An act is academically dishonest when, and only when, it is an act attempted or performed in order to misrepresent one's involvement in an academic task in any way. Such conduct will result in imposition of sanctions pursuant to University Regulations.

It is the responsibility of both the student and person in charge of an academic task, respectively, to make reasonable efforts to learn of, or make known, the expectations and standards of conduct required in the performance of an academic task. Failure on the part of the student to observe and maintain required standards of academic honesty will require corrective action by officials.

Graduate Student Regulations and Policies

All regulations are subject to change without notice by action of various administrative officers, the University of Wyoming Board of Trustees, and the appropriate departments and divisions. Published regulations are the minimum requirements for any advanced degree.

Admission Regulations

Please see Graduate Admissions section (www.uwyo.edu/registrar/university_catalog/admiss_grad.html).

Coursework Applied to Graduate Degree

Rule of 12

The Rule of 12 regulates the number of credits a student may use as non-degree and transfer credits. With committee and college approval, a student may submit up to a total of 12 pre-admission hours that may be an accumulation of non-degree, reserved, and/or transfer hours. The maximum number of hours allowed from each category is as follows: 12 non-degree graduate, 6 reserved and 9 transfer hours. A student may elect to use a combination of the three different areas to total the 12 credits allowed (e.g. 6 non-degree hours, 3 transfer hours, and 3 reserved hours). Please review the individual sections of the catalog that cover the specific policies for non-degree hours, reserving coursework for graduate credit, and transfer credit.

Transfer Credit Available to Graduate Students

To transfer graduate hours earned at another institution to a graduate program at UW, the student must provide an official transcript from the institution where the credits were earned. This official transcript must be part of the student's permanent file. The student must also provide evidence that the course was approved for graduate credit at the institution where the course was taken.

No more than 9 semester hours that have been transferred from another accredited institution may be used for meeting the credit hour requirements of a master's student's program. Transferred hours must carry a B (3.000) or better (A=4.000) grade and will not reduce the residence requirements. Transfer hours taken for satisfactory/unsatisfactory (or pass/ fail) grades are not acceptable on a program of study.

Coursework hours approved for transfer from another college or university are considered as part of the 12-credit-hour pre-admission course limitation for master's students.

Hours transferred from other institutions for a doctoral program must carry a letter grade of B (3.000) or better (A=4.000). Ed.D. and Ph.D. candidates may transfer up to 48 credit hours of such coursework, only four of which can be thesis research. Transfer hours for doctoral students are not considered as part of the 12-hour pre-admission course limitation.

Non-Degree Hours

A student may request that up to 12 hours of graduate-level coursework, taken during the student's graduate, non-degree status, be used toward a program of study should the student choose to pursue a graduate degree at the University of Wyoming. This would be subject to the approval of the student's graduate committee and the college dean. These hours can be affected by other pre-admission (reserved and transfer) hours.

Once a student obtains 12 non-degree hours, they must gain admission to a graduate degree program to ensure that subsequent coursework beyond the 12 non-degree hours can apply to a graduate degree.

No student can remain in graduate status beyond 18 hours of graduate course work without admission to a degree program. Students who wish to take more than 18 hours of coursework but do not wish to pursue a graduate degree should consider declaring a second bachelor's degree. If a non-degree graduate student anticipates attaining a graduate degree at any time in the future, they should declare and be accepted into a graduate program. Not more than 12 non-degree hours will be accepted toward a graduate degree. It is not in the interest of the student to take more than 12 hours as a non-degree student. Declaring a graduate program provides the student with the advising and support needed to make reasonable progress toward a degree.

Reserving Coursework for Graduate Credit

Approved graduate level courses taken prior to completing the baccalaureate degree, but not part of that degree's requirements, may be applied to the master's or doctoral program with the approval of the student's committee. Approval for reserving the coursework is rendered jointly by the adviser and college dean, and applies only to courses previously reserved for graduate credit.

If a course is dual listed at the 4000/5000-level, the course must be taken at the 5000-level to receive graduate credit. Each 4000-level or

5000-level course must be reserved for graduate credit by completing the Request to Reserve Coursework for Graduate Credit form. The form must be completed and submitted to the Office of the Registrar by midterm of the semester in which the coursework is taken.

These courses will appear on the undergraduate transcript with a notation that they have been reserved for graduate credit.

Students will only be allowed to transfer six hours of coursework that has been reserved for graduate credit into their degree program.

Correspondence Courses and Credit by Examination

Correspondence courses and credit by examination courses are not acceptable on graduate programs of study.

Second Baccalaureate Degrees

A student working toward a second baccalaureate degree is subject to all regulations concerning undergraduates and is not considered a graduate student. Students requesting to reserve coursework for graduate credit must be able to complete their undergraduate degree within 12 months of the request. Only six hours of undergraduate coursework reserved for graduate credit will be allowed for consideration in a graduate degree program.

Second Graduate Degrees

All requirements for a second degree are considered separate from the first degree. Hours from the first master's degree may not be used for completing the hours toward the second master's. Hours from the first doctoral degree may not be used for completing the hours toward the second doctorate. Hours from an earned doctorate may not be used in a subsequent master's degree. (Some credits may be shared between approved joint degree programs.)

Grade Point Average

A UW cumulative grade point average of at least 3.000 is required for graduation and good standing. Hours for which a C was earned may be balanced by a corresponding number of hours for which an A was earned. Departments and divisions have the option of indicating subject areas in which they will not accept grades of C for credit regardless of accumulated grade point average. No credit will be allowed toward an advanced degree for coursework in which a grade lower than C is earned.

A graduate student enrolled at the university shall be placed on academic probation at the end of a semester or summer session when his or her graduate cumulative UW grade point average in 4000-level or higher courses is below 3.000. Students who fail to bring their graduate GPA to 3.000 and remove themselves from probation after one semester or summer session will be suspended from the university. No student in their semester of probation will be employed as a graduate assistant on the UW campus.

The 3.000 cumulative GPA requirement is considered to be a minimum requirement. Individual departments or programs may establish criteria higher than these minimum performance standards and establish department- or program-specific criteria for satisfactory academic progress. A graduate student may be dismissed from a degree program for lack of satisfactory academic progress, as determined by the department or program offering the degree. Students dismissed for lack of progress can appeal, but will necessarily direct their appeal to the department within which the degree resides. Dismissals of graduate students from degree programs are at the discretion of the department.

All courses taken at the graduate level included in the GPA as listed on the academic record if the courses are numbered 4000 or above, and are used in determining probation/suspension.

Satisfactory/Unsatisfactory Grades

All courses taken to fulfill the requirements for the degree program must be taken for letter grade (A through F) except those courses given for S/U only.

The grade of S (satisfactory) is interpreted to include grades A through C and the grade of U (unsatisfactory) to include grades C-through F on the conventional grade scale for courses numbered less than 5000 (for courses 5000 or above, the grade of S is interpreted to include grades A and B). Credit hours of S/U courses are counted as hours attempted toward graduation. However, neither the S nor U grade carries grade points nor will be included in the calculation of the cumulative grade point average.

The faculties of the various colleges shall determine the number of credit hours of S that may be used to satisfy degree requirements in their programs. They may also place restrictions upon the use of S credits to satisfy college or major requirements. In addition, they may designate particular courses in their colleges as courses to be offered for S/U only.

The grade of S in thesis and dissertation research is a judgment that the student is adequately engaged in the required research objective. It in no way implies that the final thesis or the thesis defense will be judged of sufficient quality for the award of the appropriate degree.

Incomplete Grades

The incomplete grade (I) is a temporary grade used under circumstances where awarding a grade would be unjust or not reflective of the student's actual performance in a course. The assignment of an I is intended for use in unexpected circumstances; the Incomplete cannot be assigned simply to allow additional time to complete a course in the absence of unusual or unanticipated events. Graduate students who are unable to complete a course in normal class time period, and are not dealing with unusual or unexpected circumstances, should not receive an Incomplete grade. In the event of unusual circumstances, when an Incomplete grade is a reasonable alternative, the time allowed for completing course requirements will normally not exceed 120 calendar days beyond the end of the semester in which the I was given. The dean of a college may designate certain research courses where the 120-day limit may be extended by the instructor.

The I will revert to an F if the final grade for the course is not received in the Office of the Registrar by the date indicated on the authorization. Students receiving an incomplete in any course(s) listed in their program of study must have the incomplete removed by the end of the semester in which they turn in their intent to graduate. If the incomplete is not removed, the student will not graduate that semester.

Academic Dishonesty

Academic dishonesty and scholarly misconduct will not be tolerated. Academic dishonesty is an act attempted or performed that misrepresents one's involvement in an academic task in any way, or permits another student to misrepresent the latter's involvement in an academic task by assisting in the misrepresentation (www.uwyo.edu/generalcounsel/current-uw-regulations-and-presidential-directives/).

If academic dishonesty has been established, the offending student shall receive a failing grade for the course in question. If two such acts have been recorded at different times or in different courses, the student shall be suspended from the university in accordance with UW Regulations. These actions shall not preclude the imposition of other sanctions by university officers including the loss of benefits from programs, scholarships, and other opportunities normally afforded students.

Degree Revocation

The University of Wyoming is a state higher education institution whose Trustees are legislatively empowered to confer degrees on students who have earned them, upon the recommendation of the faculty. The Board of Trustees recognizes that there may be instances where a degree is awarded to an individual who, upon review, has not properly completed all requirements for the degree. In such instances, the Board of Trustees may revoke the degree. This regulation establishes the process for such revocation.

Grounds for revoking a degree include convincing evidence that the degree recipient failed to complete the requirements for the degree that were in effect at the time of the degree conferral. Included in this category is evidence that the candidate engaged in academic misconduct serious enough to negate bona fide completion of one or more substantive degree requirements. Additional information can be found at www.uwyo.edu/generalcounsel/current-uw-regulations-and-presidential-directives/.

Course Numbering for Graduate Credit

Courses offered for graduate credit are distinguished by number as follows:

4000-4999 are primarily for junior and senior students, but also may be used as part of some graduate programs of study. Not more than 12 hours of 4000 level coursework will be permitted on the graduate program of study.

5000-5999 are primarily for graduate students

Courses numbered 5000 or above may be taken by undergraduate students having the necessary prerequisites. If a course is filled, graduate students will have preference and undergraduates may be asked to relinquish their place in the course. Graduate students may enroll in courses numbered 1000-3999 to remove undergraduate deficiencies, but only those numbered 4000 and above will be computed into the graduate GPA and are allowed for graduate credit.

Dual Listed Courses

If a course is dual listed at the 4000/5000 level, the course must be taken at the 5000 level to receive graduate credit regardless of whether the course is in the student's primary program area.

The syllabus for a dual listed course must specifically differentiate expectations, outcomes and assessment between the 4000 and 5000-level components, clearly describing the additional effort needed for graduate level credit. Students enrolled in the 5000-level course will be expected to demonstrate greater sophistication in content expertise, inquiry, creativity, communication, problem solving, analytic reasoning and/or collaborative learning compared with those enrolled in the 4000 course. Examples include (but are not limited to) intellectual skills, discipline-specific competencies and challenging learning outcomes. Students enrolled in the 5000-level course may be required to lead discussion sessions, submit a portfolio, write a paper or may be involved in a service learning component, internship or collaborative assignment designed to provide experience in applying course information in different contexts.

Courses Not Applicable Toward Advanced Degrees

Only courses at the 4000 or 5000 level may be counted for graduate credit. However, some 4000- and 5000-level courses may not be applicable toward undergraduate or graduate degrees. These courses are listed below:

- **** 5959. Enrichment Studies in _____. (Any course numbered 5959 is not applicable toward UW degrees.)
- EDUC 4740. Field Studies in _____. (Any course in the College of Education numbered 4740 is not applicable toward UW degrees.)
- CNSL 5740. Continuing Education in _____.
- KIN/HLED 4074. Field Studies in _____.
- HLED 4970. Field Experience in Health Education.
- **** 5920 Continuous Registration: On Campus
- **** 5940 Continuous Registration: Off Campus

Distance Education Courses

Distance Education to carry graduate credit, must satisfy achievement criteria acceptable to Academic Affairs and must be taken under the auspices of UW. Distance Education delivery of existing graduate on-campus graduate courses (hybrid courses) are acceptable examples.

In-Residence Coursework (Residency)

In-residence coursework includes courses and/or research work on the UW Laramie campus (including distance/online), at an approved UW off-campus course site, and/or research work done for credit in the field under the direction of a UW faculty member.

The minimum number of semester credit hours that must be earned on the UW Laramie campus or at an approved UW setting for a particular degree program shall be determined by the individual colleges. In no case shall these minimum numbers of credit hours be less than

21 hours beyond the bachelor's degree for the master's degree, 21 hours beyond the master's degree for the doctoral degree, or 24 hours beyond the bachelor's degree for the doctoral degree.

In computing the in-residence requirements for the Plan A thesis and doctoral degrees, credit earned working on the thesis or dissertation shall apply.

Repetition of Courses

No more than two courses (total of six credit hours) available for graduate credit may be repeated by students at the graduate level. This regulation does not apply to those courses carrying variable credit (e.g., research or independent study). Variable credit courses are considered repeated only when so certified in writing by the instructor and the registrar.

Continuous Enrollment

Once admitted, all degree seeking graduate students must maintain continuous enrollment. Unless a formal leave of absence is approved, all students must maintain at least one hour of continuous enrollment, including in the semester or session they expect to receive the degree. Students should maintain enrollment for two of the three academic semesters. Readmission will be required if the student has not enrolled in classes within the previous 12 months. Readmitted students should contact their department to learn more about their status. The department will contact the Office of the Registrar to initiate reactivation. Students who have been inactive for a long span of time should also investigate the status of their committees, programs of study, and time to degree status. International students' enrollment status is monitored by the office of International Students and Scholars and the office should be contacted for more information. Only students not supported on a Graduate Assistantship are eligible to enroll in Continuous Registration.

Time Allowance and Limitations

Master's students have six calendar years to complete their degrees from the beginning of the first course taken and listed on the program of study, including any transfer courses. Doctoral candidates have four calendar years after the successful completion of their preliminary examination to complete their degree and they must complete their degree within eight years of the first course taken and listed on their program of study, including any transfer courses.

Guidelines for Satisfactory Academic Progress

Graduate students should undergo annual reviews within their academic unit to document and verify their progress and faculty expectations for them in attaining their degree. Students that do not meet the following guidelines for Satisfactory Academic Progress may be subject to dismissal by the academic degree-granting unit, contingent upon a joint review by the Department Head and Committee Chair. Dismissal of a student for lack of satisfactory academic progress requires that the student's deficiencies are clearly documented and the potential dismissal

documentation must be provided to the student for response. Once presented with the potential dismissal, the student must be allowed one academic semester to rectify inadequate progress. At the conclusion of that semester, the Committee Chair and Department Head must jointly concur that the student progress is either satisfactory for retention or that the student should be dismissed from the degree program. For the purposes of determining satisfactory progress, the student must demonstrate successful performance of their duties and completion rates under a specific timeline (specified in the proposed dismissal document). If the student cannot meet the maximum timeframe and completion rates below, they may receive a maximum of one 1-year extension of time to completion (specified in a document of retention), and only if the student holds academic standing to continue enrollment. Final decisions for dismissal or retention require agreement of both the Committee Chair and Department Head. Retention in the program requires that the Chair and Department Head document for the student all requirements for retention that clearly defines the path to successful degree completion within a specific time period. Retention requires that the student cannot drop or withdraw from any subsequent courses or enroll in coursework that is not identified in their Program of Study.

Maximum Credits

Students must graduate before attempting more than 150% of the hours required for their degree program (e.g. 45 hours for a 30-hour Master's degree program or 108 hours for a 72-hour Doctoral program.) Repeated courses (up to 6 hours) will accrue hours only once for the purposes of this calculation. Courses dropped in the drop/add period will not be included in attempted hours or the maximum credit calculations. Hours accumulated in one graduate program will count toward the maximum timeframe should the student initiate a new graduate degree program without completing their initial graduate degree.

Degree Status

Students must have an academic standing that allows for continued enrollment (i.e. 3.000 GPA in their graduate coursework and any other specific requirements of the degree program).

Research or project outcomes

Students must demonstrate delivery of research or creative products in disciplines for which they are required to attain the graduate degree. Research activity in itself should not be confused with products and outcomes. For example, an approved research proposal, a thesis, a dissertation, peer-reviewed publications, external project reports, performances or professional presentations are outcomes whereas writing, conducting a literature review, attending meetings etc., although important, are research activity but are not outcomes.

Petitions and Appeals

The University of Wyoming, as a fully-accredited public institution of higher education, must comply with general laws, regulations, and principles of fairness, uniformity, and accountability. Exceptions to uniform application of general regulations are justified only in extraordinary circumstances. Exceptions to regulations may be petitioned by submitting the appropriate form to the Associate Vice Provost of Graduation Education. Regardless of the signers' recommendations, the registrar may deny the exception. If the petition is denied by the registrar, the student may elect to pursue the petition with the Provost.

The Graduate Student Appeals Board (GSAB) was established to provide an appellate body to review appeals of graduate students concerning retention in graduate programs, employment as graduate assis-

tants, and charges of academic dishonesty or scientific misconduct. The GSAB members are faculty and graduate students from the Graduate Council and represent campus-wide disciplines. The GSAB will not hear appeals of course grades or charges of academic dishonesty associated with a course (these appeals will be handled by the procedures of the college in which the course is offered). Appeals emanating from Plan B, thesis, or dissertation research will be heard by the GSAB. The GSAB will hear appeals of course grades or charges of academic dishonesty associated with a research course (i.e. thesis, non-thesis, or dissertation research). Policies and procedures for graduate student appeals may be found on the Academic Affairs' Graduate Education web site (<http://www.uwyo.edu/uwgrad/>).

Steps Required for Degree Completion

Once a student enters a graduate program, it is critical to initiate a committee to guide course selection and the graduate program. Clear guidance from the department and the graduate committee, especially the committee chair, facilitate steady progress toward a graduate degree. A student's graduate committee requires approval by the department or division chair or head, the college dean, and the Associate Vice Provost for Graduate Education. The committee functions to guide the student in coursework selection, the degree project construction, and in fulfilling the requirements to complete the degree.

It is the responsibility of the graduate student, in consultation with their major advisor (usually the Committee Chair) to form a viable committee within the first two semesters of their graduate program. The graduate committee must be on file with the Registrar before a Program of Study will be approved.

The committee will serve in an advisory capacity for development of the student's coursework and research programs and must approve the official program of study form filed with the Office of the Registrar. The committee will also determine pass or fail on the preliminary examination, approve or disapprove the project, thesis, or dissertation documents, and will conduct the final examination.

Changes in committee membership or faculty assignments can be requested at any time by the student, in consultation with the Committee members and the department/division head. Committee changes require the written acknowledgement of faculty who are either added or removed from the committee, accomplished with the Change of Committee form.

Committee Formation

Every committee must be designed to best support the student project or research, facilitate a timely and effective graduate program, and to document fulfillment of all requirements of the graduate degree sought; committees should be formed by the end of the student's second semester. Committees are formed to guide the student and the research or project to ensure a rigorous and fair process. Students must weigh the expertise of the committee membership against the number of members they select, to insure good mentorship and to facilitate meeting function and effectiveness. More detailed information on committee formation is available at www.uwyo.edu/uwgrad/_files/docs/grad_committee_formation_policy.pdf.

The graduate committee consists of at least three members for master's and Ed.D. and five members for doctoral degrees: the chair of the committee (the major professor) from the degree-granting department or division, an outside faculty member of a department or division other

than the one awarding the degree, and additional required members. Committees that include a co-chair may indicate the co-chair as the third member.

Membership Roles on Graduate Committees-Required members:

All committees must include a majority of members from UW faculty. All members of a committee hold equivalent voting rights except when a tie vote occurs. In the case of tied votes the Chair, with the concurrence with the outside member will determine the outcome.

Chair- All committees will have at least one member from the degree-awarding department/division as chairperson. The chair should closely direct the student's project or research and guide the student to form their graduate committee. In most cases, annually appointed academic faculty (temporary, visiting research professor, clinical professor and professor of practice should not generally be chair graduate committees. The Chair guides timely progression of the student throughout their program and assessment of that progress.

Outside member- A critical committee member usually is a tenured faculty from outside the major department/division who serves as the Outside member. The outside member is defined as a tenured or tenure-track UW faculty member holding an appointment in a division or college other than the one from which the candidate will receive the degree. It is the role of the Outside member to assist the student, in consultation with the Chair to work to resolve any issues that may arise during the student's graduate program. Their role lies in protection of fairness. The outside member also reviews the student and their graduate program to ensure academic rigor. The Outside member provides assessment of the graduate student's learning and of the program rigor and fairness. Untenured tenure-track faculty members may serve as the Outside member if they have demonstrated experience mentoring graduate students and if the Committee Chair has no role in evaluation of the untenured faculty member.

Additional Required Members- a third faculty committee member (Masters and Ed.D.) and third and fourth required members (Ph.D.) can be selected from the student's home department, program, or division, although discipline requirements differ. If there is a committee co-chair, they may be considered the third member on a master's committee. The fifth member of doctoral committees may be an external member.

Added members- (members in addition to the required members on any committee). Additional members may be placed on a committee either from within or outside the department or program. Members of the UW faculty who are extended term with appropriate academic roles can serve. Additional faculty including *annually appointed academic faculty*, can be added to any committee for their expertise as desired. Students should be conservative in the total number of members on their committee.

Optional committee members:

Co-Chair- in some cases, two faculty may be closely directing the project and graduate student. In such cases, they may serve as co-chairs. A co-chair can be considered the third member on master's committees.

External member- An individual with an off-campus affiliation may serve as an external member. The external member of the committee is a faculty member at a peer institution or an individual holding professional expertise that will contribute to the committee. Such an appointment assumes that the external member participates fully in

the essential components of the degree-granting process and holds full voting privileges. Often, external Adjunct faculty serve as external members. The external member cannot replace the outside member.

Other members- Faculty members leaving UW more than a semester prior to the students intended date of completion must be replaced with a UW faculty member on the graduate committee to ensure effective mentoring. The departing faculty may remain on the committee as an external member

Program of Study

Following formation of the committee, each student must submit a program of study to the Office of the Registrar for approval. The Program of Study form details the minimum coursework and credits that will apply in fulfillment of the graduate degree. The program of study form is available online at, www.uwyo.edu/registrar/students/graduate_student_forms.html.

The completed form should be returned with all required attachments to the Office of the Registrar. Degree Analysts will transcribe the program into a degree evaluation, which constitutes an agreement between the student, the student's committee, and the university wherein the minimum coursework requirements for that student's degree are listed. The program should be filed no later than the beginning of the student's third semester (or second Summer Session if enrolling only in summers). No master's student will be a candidate for a degree until his/her program is approved by the head of the appropriate department and the college dean. Master's degree candidacy coincides with the approval of the program of study.

The program of study must include the minimum number of appropriate semester hours of graduate credit required by the degree granting unit. Some degree programs require more than the minimum hours of credit required by the university. Students must consult with their advisers and all departmental guidance documents including this catalog. It is the responsibility of the student to insure that their program of study complies with degree fulfillment requirements. Changes to an approved program must be submitted to the Registrar, using the Request for Change in Graduate Program form.

Language or Other Tool Requirements for Doctoral Candidates

The prospective Ph.D. student should refer to the specific department in which he/she desires to major to ascertain what languages or research tools are required. Certification of a language or tool, if required, will be made by the appropriate agency or department of the university to the Office of the Registrar when proficiency requirements have been met to fulfill the tool requirements. Students may demonstrate proficiency on a standardized language examination prepared by the Educational Testing Service, or by receiving at least a grade of B in a course (or courses) specified by a department on this campus or on a reading test administered by the department. It will be each student's responsibility to see that certification of proficiency for tool requirements is made. Coursework certification may be made from transcripts filed by the student with the Office of the Registrar.

Examinations

Examinations may be required of any graduate student or advanced-degree candidate at such time or of such nature as the department or the student's graduate committee may require. It is standard procedure for doctoral students (Ph.D. and Ed.D. students) to be given a prelimi-

nary examination, and for final examinations to be conducted for both masters and doctoral students. It is common for the nature of these exams to differ from one academic unit to another.

Preliminary Examination

Candidacy in the doctorate occurs upon certification of successful completion of the preliminary examination. The preliminary examination will be held at least 15 weeks prior to the final examination. The preliminary examination may not be given before: (a) the research tool requirements, if any, have been met and certification approved; (b) at least 30 hours of coursework have been completed; and (c) the doctoral program of study has been approved. The format and conduct of this examination shall be the responsibility of the student's committee, in accordance with any departmental policies (see specific departmental guidelines).

Following the completion of the departmental preliminary examination, the Report on Preliminary Examination must be submitted to the Office of the Registrar, regardless of whether the student passed or failed. The favorable vote of the majority of the student's graduate committee members, including the Chair and Outside member, will be accepted as passing. In case of failure, the student may repeat the examination once only, after 120 days have passed but not more than four semesters have elapsed. When the preliminary examination has been successfully completed, and the report of the committee is filed in the Office of the Registrar, the doctoral student is admitted to candidacy for the degree. At this time, the doctoral candidate has four years from the semester of the preliminary exam to complete the degree process.

Admission to Candidacy

Time spent in graduate study or accumulation of credit hours will not necessarily allow a student to become a candidate for an advanced degree. Admission to candidacy is an expression of the judgment of those who have observed the work and reviewed the credentials of the student, and deem the student worthy of the opportunity to complete the work for an advanced degree. Admission to candidacy for an advanced degree requires a specified procedure for specific degrees.

Final Examination

The final examination may not be held until after the beginning of the semester or session in which coursework is completed. The date, time, and place of the examination must be announced to the public a minimum of two weeks before the final examination is held. The committee may require the candidate to take a written examination as well as an oral examination. The thesis or dissertation document must be submitted to the candidate's committee at least three weeks prior to the final exam. The thesis or dissertation must be available for inspection by any other member of the faculty who may wish to examine it.

The oral and/or written examination should be held by the student's graduate committee **at least 10 days before the end of the term of graduation**. A student failing his/her final examination may retake the examination once only in the following minimum of one and not more than three semesters to allow the student to address any deficiencies identified by the committee during the initial testing.

Following the student's defense, the student will submit a signed Report on Final Examination form to the Office of the Registrar. The written vote of each member of a candidate's committee must be on record in the Office of the Registrar on the Report of Final Examination form. Committee signatures must indicate that the majority of the committee approve recommendation of the student to receive the advanced

degree. Any majority of committee member signatures on this form that includes both the Chair and the Outside member will be received by the Registrar as indication that the degree should be awarded. The form also provides documentation from the student's committee that the student has passed the Final Examination/Defense and that the committee has approved the final version of the thesis or dissertation that will be publicly available. The Registrar requires the student to make the document publicly available via ProQuest. All students whose programs require a Thesis/Dissertation must submit the document to ProQuest before the last day of classes. Once the final examination is passed and reported, a Degree Analyst will review the degree evaluation to verify that any discrepancies have been corrected, confirm that final grades on any remaining coursework have been posted, and that all required forms and documents have been submitted. Once all requirements have been met, the degree will be awarded.

Declaring a Graduation Date

An Anticipated Graduation Date form must be filed for the semester in which graduation is planned. This form puts the student on the list for graduation. If graduation does not occur during the projected semester, the student must submit a new form no later than the deadline date for the new final semester. By the designated deadline, students who are entering their semester of graduation should:

1. Download the Anticipated Graduation Form from the Office of the Registrar website and submit the completed form to the Office of the Registrar.
2. Pay their associated graduation fees (diploma and/or certificate fee) and retain receipt.

If discrepancies are found during the degree check, the Degree Analyst in the Office of the Registrar will contact the student/chair with instructions for resolution.

Final Steps in Completion of Degree Requirements

Thesis or Dissertation Documents

The candidate shall submit an electronic thesis or dissertation demonstrating the candidate's ability to communicate the outcomes of their graduate program.

The master's thesis and doctoral dissertation are integral components of graduate education. For many disciplines, publication of student research in peer-reviewed journals is a hallmark of successful graduate education that validates the scholarly results. The university encourages the use of published papers in the final document, subject to some guidelines.

Publications included within a thesis or dissertation must be must have been submitted for publication in scholarly peer-reviewed journals. The citation for any published papers must appear within the introductory chapter. The publications must be written by the student. Editorial oversight by the mentor and committee is desirable; however, the mentor and committee have the responsibility to ensure that the student is the main author of the thesis or dissertation. For multi-authored journal articles included in the thesis or dissertation, the contribution of each author must be clearly stated in the preface or introduction to the thesis or dissertation and in a footnote on the first page of the article. If more than one publication is included, the articles must be joined into a coherent whole, having a clear focus of inquiry. In addition to the journal papers, a thesis or dissertation must include comprehensive introduction and discussion chapters that unite

the document and provide context for the journal papers. A thesis or dissertation is not evaluated relative to accumulated credit hours. The thesis or dissertation document and all appendices must be provided in an electronic format for upload into ProQuest following the format of standards established by the University Libraries, ProQuest Information and Learning.

Digitizing and ProQuest Upload Requirement

All graduate students accept as a condition of enrollment that completed theses and dissertations will be published through ProQuest Information and Learning. This involves a special fee. The appropriate form for submitting the thesis/dissertation is available when submitting the project electronically through ProQuest Information and Learning.

Survey of Earned Doctorates

The university requires the Survey of Earned Doctorates and the Report on Final Examination form be submitted on or before the date established by the Office of the Registrar for fulfilling the requirements for advanced degrees each semester. The survey is available on the Graduate Student Resources Web site. All Ph.D. students must complete this survey.

Patenting or Copyright by UW

In some cases, where significant university funds or resources have been used in dissertation research, the university may claim an interest in patenting or copyrighting the results. When this seems likely, the student (or the student's major professor) should consult with the college dean or the vice president for research.

Classified or Proprietary Research

The process of research in graduate education is one of free and open inquiry involving the student and faculty. Final examinations for graduate degrees are open to all faculty, and theses and dissertations are accessible to the public upon acceptance by the university unless embargoed as approved in advance.

For the purposes of this policy, classified research is defined as research that has a security classification established by a federal agency. Classified research projects also require approval of the trustees before being initiated. Classified research cannot be used for a thesis or dissertation.

Proprietary research is defined as research for which the sponsor requires a delay in publication. Given these clarifications, the following policies are used for theses and dissertations. Proprietary research may be used for theses and dissertations. However, any delay caused by the proprietary nature of the research must be alleviated before the thesis or dissertation is submitted to the Office of the Registrar. Such delays cannot exceed six months without the approval of the college dean. Delays greater than 12 months in length will be approved only in unusual circumstances unless embargoed as approved in advance by the college dean. Sponsors of proprietary research should be aware that theses and dissertations are accessible to the public upon acceptance.

Embargo

Students wishing to embargo/copyright or otherwise delay release of their thesis/dissertation must have previous authorization of the college dean and the Office of Research and Economic Development on file in the Office of the Registrar.

Overview of Graduate Degrees Awarded

In all cases, graduate students should confirm the departmental guidelines for the degree they seek. The information presented here is intended to provide only a general overview of the graduate degrees. Individual colleges and departments may apply more rigorous requirements for their graduate degrees than the minimal requirements described here.

Master's Candidates

The standard master's degrees are the Master of Arts (M.A.) and the Master of Science (M.S.). Generally, Master of Arts degrees are more common in the arts, humanities and social sciences, while Master of Science degrees are more common in the health, natural and physical sciences, business and engineering. The program of study includes a declaration that the student will pursue a particular project plan: either a Plan A thesis or a Plan B non-thesis. Once the program of study has been approved for a master's student, the student advances to candidacy. The master's program of study, whether a declared thesis or non-thesis project plan, must include a minimum of 30 hours of graduate credit.

A culminating defense is required for the Plan A and the Plan B master's programs. The final defense is an essential component of all graduate degree programs.

The defense structure and format is flexible but it should allow opportunity for the student to demonstrate content comprehension and application, critical and quantitative analysis, creative thinking, problem solving, synthesis, and evaluation.

Following the defense, regardless of the outcome, the student will submit a Report of Final Examination form to the Office of the Registrar. This form is available at http://www.uwyo.edu/registrar/students/graduate_student_forms.html.

Plan A Master's

This program type must reflect a minimum of 26 hours of acceptable graduate coursework and four hours of Thesis Research credit (course number 5960; course number 5980 may also count). The Plan A thesis option accommodates original research, although the degree of originality and the definition thereof is sometimes program-specific. The planning, development, and production of the thesis is guided by the committee chair and the graduate committee.

The thesis is the final, written product of the project. General required guidelines for preparing a thesis are available in the "Thesis and Dissertation Format Guide." The thesis must be submitted to the student's committee at least two weeks before the intended date of final examination.

The electronic copy must meet the standards established by the faculty and those of the University Libraries. This copy, submitted to ProQuest will ultimately be deposited in the University Libraries. Each student normally submits at least three hard copies of his/ her thesis: one for the thesis director, one for the department, and one to retain for personal use.

Plan B Master's

The Plan B non-thesis program differs from the thesis program in that it includes additional hours of coursework instead of thesis hours. It permits a wider distribution of courses and permits a wider array of possible final products than the Plan A thesis program. The non-thesis project may take the form of a business plan or a professional portfolio. Each academic unit that engages in Plan B non-thesis activities often

has its own set of principles that guide students in degree requirements. It is the responsibility of the student to consult with their committee chair to clarify specific guidelines for the Plan B Master's degree in their discipline.

Most, but by no means all, of the academic units that have students pursuing master's degrees in the Plan B non-thesis category have the students prepare a paper, or sometimes two papers, as their final project. In the selection of a subject and preparation of the paper(s), the student shall be guided by the committee, or adviser or, in some academic units, by the instructor(s) in charge of the course(s) connected to the paper(s). The paper(s) should present the results of study at a level of scholastic quality commensurate with a Plan A thesis project. The student and his or her adviser often, but not always, decide if a project will be Plan A or Plan B. Academic units have principles that guide students in this selection. Many units have rules that precisely dictate the type of program and project a student can conduct.

The format for the Plan B non-thesis paper should follow that of the Plan A thesis. However, Plan B non-thesis paper titles do not appear on the student's transcript, whereas, Plan A thesis titles do. Plan B non-thesis papers are not filed in the University Libraries and they are not submitted to ProQuest. They are filed with the major academic unit.

Master of Arts in Teaching (M.A.T.) and Master of Science in Teaching (M.S.T.)

Candidates for the M.A.T. or the M.S.T. should have completed the requirements for teacher certification prior to application for admission to graduate study. The M.A.T./M.S.T. program is completely separate from State certification requirements. Hours used to meet certification requirements cannot be applied toward the M.A.T./M.S.T. degrees.

The M.A.T./M.S.T. degrees are only modifications of the Plan B non-thesis option and are subject to the requirements of the admitting department and the general requirements of the faculty.

At least 24 of the 30 semester hours required must be in a particular teaching area (e.g., chemistry, history), with at least 12 hours in one department. A student working jointly in two departments must take at least 12 hours from each department.

The M.S.T. is designed for one teaching area and must include 18 hours in, or the total required by, that area. A program designed for two teaching areas must include 12 hours in, or required by, each of the specified two areas. Courses offered by the Science and Mathematics Teaching Center do not constitute a separate area in themselves but may be applied to an appropriate area. A program designed for two teaching areas must be approved by the heads of both departments, and the graduate committee for this program must include one member from each department. The M.S.T. is intended for individuals teaching at the secondary level. The program should represent the student's needs.

Master of Business Administration (M.B.A.)

The Master of Business Administration degree is offered to qualified students who wish to pursue a professional and highly applied degree program. Offerings include full-time, on-campus programs of study and part-time, online programs of study.

The U.W. M.B.A. program delivers professional management education that connects principles, concepts, and intense case analysis with real-world experience as tools for making business decisions. Students will develop leadership and managerial skills and will possess the education and training needed to compete in today's rapidly changing global business environment. The total program experience, inside and

outside the classroom, is designed to provide experiential learning along with access to powerful networks. Satisfactory completion of at least 47 semester hours and participation in all MBA activities are required. Please see the Master of Business Administration section for specific requirements (<http://www.uwyo.edu/mba/>).

Master of Music in Performance (M.M.)

The Master of Music in Performance (M.M.) is intended for the student who wishes to pursue a career as a performer, to prepare for doctoral study, or to improve his or her performance ability. Students must pass an entrance audition for admission to the program. The entrance audition should be performed the semester prior to admission. Graduate Placement Examinations in history and theory will be administered the week prior to the commencement of classes and will determine if a student may advance to graduate level coursework. Failure of one or more sections will require a refresher course in the fall (Graduate Fundamentals). Major area studies consist of courses appropriate to the student's area of concentration. A minimum of 50% of courses taken must be deemed "graduate level only" (5000-level). Satisfactory completion of at least 30 semester hours and a Plan B paper or lecture-recital are required. Please see the Department of Music section for specific requirements (http://www.uwyo.edu/music/graduate_students/index.html).

Master of Music Education (M.M.E.)

The Master of Music Education is intended for those students who wish to improve their teaching abilities for the public school environment or to enable them to teach at the college and/or university level. Graduate Placement Examinations in history and theory will be administered the week prior to the commencement of classes and will determine if a student may advance to graduate level coursework. Satisfactory completion of at least 30 semester hours is required. Either Plan A (thesis) or Plan B (non-thesis) options are available. Please see the Department of Music section for specific requirements (http://www.uwyo.edu/music/graduate_students/index.html).

Master of Public Administration (M.P.A.)

The M.P.A. degree is designed for both pre-career and mid-career students who seek leadership positions in public service. The program is designed to meet the needs of place-based working professionals through distance education technology, while full-time traditional graduate students can pursue their coursework in-person, on campus. At least three years of successful professional experience is required to be classified as "mid-career." For traditional graduate applicants, an internship is required at some phase of their studies on campus. Satisfactory completion of at least 39 semester hours is required. Please see the Political Science section for specific requirements (<http://www.uwyo.edu/mpa/>).

Master of Social Work (M.S.W.)

The Master of Social Work is designed to prepare graduate students for advanced level social work practice and leadership positions in human service organizations with an emphasis on social justice and anti-oppressive perspectives. The M.S.W. program is focused on an advanced generalist curriculum and rural social work that relies on the problem-solving method and is based on the values, knowledge, and skills of the profession. The M.S.W. is a full time, campus-based program that utilizes different course delivery methods to accommodate its widespread student population. Satisfactory completion of at least 69 credit hours for the standard two-year program and 38 credit hours for the advanced standing M.S.W. program is required. Either

Plan A (thesis) or Plan B (non-thesis) options are available. Please see the Division of Social Work section for specific requirements (<http://www.uwyo.edu/socialwork/prospective-students/msw-admissions/>).

Doctor of Nursing Practice (D.N.P.)

The Doctor of Nursing Practice degree is the terminal academic preparation for nursing practice. UW's DNP program prepares family nurse practitioners (FNPs) and psychiatric mental health nurse practitioners (PMHNPs) to engage in evidence-based practice to optimize health outcomes and engage in leadership activities to promote excellence in rural health care. Both the FNP and PMHNP programs of study require 3 years of full-time study, which includes 84 credit hours and a minimum of 1140 clock hours of clinical practica experiences. During their final year in the program, students conduct a capstone quality improvement project in conjunction with a clinical agency. Please see the School of Nursing section for specific requirements (<http://www.uwyo.edu/nursing/programs/dnp/index.html>).

Doctor of Pharmacy (Pharm.D.)

The University of Wyoming School of Pharmacy offers a four-year program of study leading to the Doctor of Pharmacy (Pharm.D.) degree as the only entry-level professional degree in pharmacy. Students are admitted to the professional program following a preprofessional program of not less than two years in length with a total of at least 67 semester credit hours. The Doctor of Pharmacy degree requires satisfactory completion of 146 hours of coursework taken over a four-year period. Please see the School of Pharmacy section for specific requirements (<http://www.uwyo.edu/pharmacy/pharmd-program/index.html>).

Doctor of Education (Ed.D.)

The degree of doctor of education (Ed.D.) is offered to competent students who wish to pursue a program of study and to participate in appropriate activities in preparation for professional service in teaching, administrative, and supervisory positions in education. The program is designed to meet the needs of those for whom intensive research is not a practical prerequisite to vocational goals. Doctoral students are expected to participate not only in organized coursework but also in informal types of activities that will insure breadth of outlook and technical competence.

Each student admitted into the Ed.D. program must furnish satisfactory evidence of having had three years of successful professional experience. This experience may be in teaching or administration or both. The student's graduate committee will determine what experience shall be required and when this requirement has been satisfied.

At least 36 semester hours must be earned in the major field. The degree requires a minimum of 72 graduate hours (beyond the bachelor's degree) to complete all requirements. In addition to the program of studies in organized coursework, the doctoral student will be required to complete and publicly defend an approved applied project report or dissertation within the major field of professional specialization. The project or dissertation can be a collaborative work conducted among multiple (typically two or three) graduate students in the same program area.

A student who has taken a major part of his/her undergraduate and graduate training at UW may be required by his/her graduate committee to do a specified portion of graduate work at some other institution. Please see the College of Education entry for specific requirements (www.uwyo.edu/education/current-students/graduate-education/edd-requirements.html).

Doctor of Philosophy (Ph.D.)

The doctor of philosophy degree does not represent a specified amount of work over a definite period of time but rather the attainment of independent and comprehensive scholarship in a particular field. Such scholarship will be manifest in a thorough acquaintance with present knowledge and a demonstrated capacity for research. The fulfilling of the following requirements suggests, therefore, only the minimum task one must undertake to earn the doctor of philosophy degree. No amount of time spent in graduate study or accumulation of credit hours entitles the student to become a candidate for this degree.

The program of study must include a minimum of 72 semester hours of credit at the 4000 level or above from UW or equivalent levels from another approved university. This 72-hour requirement may include graduate credits earned while working toward the master's degree in the same area, but at least 42 hours (of the 72) must be earned in formal coursework. Additional credits toward the 72-hour requirement may include additional formal course credits, Dissertation Research credits (5980 course number; course number 5960 credits may also be applied), or Internship credits (5990 course numbers). The program of study must be on file in the Office of the Registrar before the preliminary examination can be scheduled.

Miscellaneous Regulations

QuickStart Programs

QuickStart programs allow a qualified student to complete bachelor's and master's degrees in as little as five years. In addition to applying up to six hours of reserved graduate credit, approved QuickStart programs allow students to double-count up to six hours of 4000/5000-level coursework toward the bachelor's and master's degrees. QuickStart students only become classified as graduate students once they have completed all requirements of the bachelor's degree, usually in year five.

Readmission

When a student is not registered at UW for one or more years, without an approved leave of absence, the student is automatically reclassified as inactive and must reapply for admission.

Students wishing to pursue direct entry into a doctoral program following their bachelor's degree

The requirements for entry into a doctoral program are determined by the departmental faculty. In some cases, students may enter a doctoral program without having attained a master's degree. These decisions are made on an individual basis. Such students must fulfill all the requirements of a doctoral degree but may be limited in the number of graduate hours they hold in application to the 72 hour minimum. Careful planning with the graduate program and committee is needed to assure that the student makes clear progress to the degree. One consideration of the student is whether they will obtain a master's degree on the way to the doctorate. If so, the student should be considered a master's degree student until that degree is accomplished, or until the preliminary exam is passed. Once the preliminary exam is passed, the student may be considered a candidate for the doctoral degree, just as other students would. Students who do not hold a master's degree cannot be considered a candidate for the doctoral degree until they have passed their preliminary exam.

New Parent Accommodation Policy

The University of Wyoming is dedicated to ensuring optimal success for all graduate students. However, new parents are frequently forced to interrupt their education cycle, sometimes in a transient manner but often permanently.

The New Parent Accommodation policy is designed to allow new parents to maintain full-time, registered student status and facilitate their return to full participation in graduate activities in a seamless manner without penalty. The policy applies to full-time students enrolled in a graduate program. If both members of the new parent partnership are UW graduate students, one but not both will be eligible for the full accommodation. However, the university encourages accommodation of schedules for exams, assignments and programs of study for the graduate student partner. This accommodation does not apply to part-time students.

A student anticipating becoming a new parent is eligible for accommodation consideration for a period of up to one semester. The exact accommodation period will begin on the date specified on the New Parent Accommodation petition approved by the college dean. This petition must be filed and approved prior to the actual date of childbirth or adoption. Additional information can be found at www.uwyo.edu/uwgrad.

Armed Services

Time spent in the armed services is not computed in the total time allowed to complete the requirements for an advanced degree; however, students who are eligible and wish to use this time exclusion must file the leave of absence petition.

International Students

Upon arriving at the University of Wyoming, international students are required to visit the International Students and Scholars (ISS) office. This office:

- Provides support and counsel for UW's international students and scholars population regarding aspects of immigration regulations and procedures;
- orients this population to the policies and expectations of the university, the educational system, and the U.S. culture;
- hosts a mandatory orientation program for all new international students before the beginning of each semester.

Please see the ISS Web site for detailed information (www.uwyo.edu/iss).

International graduate assistants with teaching responsibilities must complete the English Proficiency Assessment Program and must participate in the Graduate Student Teaching and Learning Symposium. Check the Graduate Student Resources Web site (www.uwyo.edu/uwgrad) for dates and times.

Graduation Requirements and Procedures

Graduation Requirements

Students are personally responsible for knowing degree requirements and enrolling in courses that fulfill their degree program. Students, with the help of their advisers, design their program to satisfy their needs and aims. Students will be required to complete assessment activities as determined by the university prior to the awarding of degrees. Students are likewise held responsible for knowing regulations governing the standard of work required for continuance in the university involving academic probation and suspension.

Although this catalog is intended to set forth the various provisions for study and requirements for the awarding of degrees, periodic revisions of the provisions for study and degree requirements are appropriate (because of advances in knowledge, changes in occupational requirements, academic preparation of students, and in faculty and facilities at the university). In order for the catalog to be available in spring of each year, publication must begin the previous October. This is almost a year before the requirements specified therein become effective the following fall and almost five years before a student entering at that time could graduate. Accordingly, the university cannot guarantee the awarding of a degree based on the unchanged requirements as set forth in a particular catalog.

Adjustment to Changing Requirements

Students are expected to inform themselves of changes in degree requirements by reviewing the catalogs that are published annually and their Degree Evaluation reports; then, when necessary, adjust their degree plans accordingly.

If university or college requirements are changed, students are encouraged to adopt the new requirements; however, students will have the option of graduating under the requirements in effect when they entered the university or one of Wyoming's community colleges, provided the courses are still available. The student must accept either the new requirements or the requirements in effect when they entered the university or one of Wyoming's community colleges in their entirety, not a combination from each. Students changing colleges within the university or reentering the university after one or more years away are expected to adopt the requirements in effect at the time of the reentry. Any substitution to the above must be approved in writing by the student's adviser and the college dean and added to the student's advising folder in the department or college.

If departmental requirements are changed, students will ordinarily be permitted to continue under the requirements in effect when they entered that major department provided there has not been an interruption in their education for a year or more; however, students are encouraged to adopt the new requirements. Notice of changes will be available from departmental offices and advisers. It is the responsibility of students to keep in touch with their major departments, to learn of changes in requirements, and to plan ahead so that necessary courses can be taken by the expected time of completing a degree. Many courses are not given every semester and some not every year.

If required prerequisites for a course are changed, notice may be obtained from the department offices. The university cannot continue two courses, one with and one without a newly-adopted prerequisite. The student must therefore meet the new prerequisite or obtain per-

mission from the instructor to enroll in the course. In the event of any doubt as to the adequacy of preparation for a course, the student should consult with the instructor or an adviser in the department as far in advance as possible. Independent study, if approved, may be accepted in lieu of a specific course prerequisite.

Scholarship Standards

A UW cumulative grade point average (GPA) of at least 2.000 is required for undergraduate degrees and 3.000 for graduate degrees. The cumulative grade point average is defined as the sum of all grade points earned in residence, via Distance Education at the University of Wyoming, with the following exceptions:

1. The credit hours shall not be counted in courses in which marks of W, S, or U were assigned, or in which marks of I (for incomplete) are still in effect.
2. For repeated courses:
 - a. First repeat: only the second credit and grade is used to calculate the cumulative GPA.
 - b. If repeated more than once, only the last grade is used to calculate the cumulative GPA.
 - c. If a mark of W, S, or U is assigned in a repeated course, the previous grade assigned will stand except when an S or U is earned repeating a previous S or U.
 - d. Courses applied towards one completed undergraduate degree may be repeated as part of a second degree; however, the grade and GPA in the original degree will not be changed.
3. Transfer grades are not counted in the UW GPA. If a course taken at UW is repeated for the first time at another institution, the credits and grade earned at UW will be deleted from the UW cumulative GPA if credit for the repeated course is transferred to UW.
4. For graduate students, courses numbered below 4000 are not added into the semester and cumulative totals, nor computed into the GPA.

Semester Hour Requirements

Completion of the total minimum credit hours for undergraduate degrees from the various colleges is indicated below:

College of Agriculture and Natural Resources	120-128 hours
College of Arts and Sciences	120-128 hours
College of Business	120 hours
College of Education	120-128 hours
College of Engineering and Applied Science	120-132 hours
College of Health Sciences	120-142 hours
School of Energy Resources	120 hours

These minimum hour requirements are in line with the Higher Learning Commission's criteria for accreditation.

The total minimum credit hours for graduate degrees depends on the degree earned. Masters degrees require 30 credit hours and Doctoral degrees require 72 credit hours. See the Graduate Student Regulations and Policies for more details.

University Baccalaureate Requirements

1. A cumulative GPA of 2.000 or better from the University of Wyoming;
2. Satisfactory completion of the prescribed curriculum in which the degree is sought, including fulfillment of the entrance requirements in the college concerned;
3. Satisfactory completion of the University Studies Program: Students who entered the University of Wyoming, one of Wyoming's community colleges, or an out-of-state academic institution fall 2015 or later, are required to complete the University Studies Program 2015, a university-wide program in general education. The detailed requirements for the University Studies Program are provided in this catalog on page 53.
4. Students must complete a minimum of 42 upper division (junior/senior) or graduate-level semester credit hours, 30 of which must be earned from the University of Wyoming. Credit by examination does not count towards the required 30 hours of residency credit;
5. Not more than 24 semester hours of correspondence study courses may be used toward fulfilling requirements for a bachelor's degree;
6. Not more than 4 semester hours of credit in physical activity courses can count toward the minimum credit hour requirement for a bachelor's degree;
7. The last credit applicable to degree requirements must be earned from the University of Wyoming with the following exception: students of senior standing may complete degree requirements elsewhere by obtaining special permission of the department head, adviser, and college dean, and declaring an anticipated graduation date with the Office of the Registrar;
8. Native language credit: students are not allowed university credit for language courses below the 4000-level in their native language.

Assessment Requirement

Students may be required to complete assessment activities as determined by the university prior to the awarding of degrees.

Second Bachelor's Degree

Students seeking a second bachelor's degree must meet all of the university and college requirements as prescribed for a first bachelor's degree. Students whose first degree was received from an institution where English is not the predominant language must complete the University Studies Communication I (COM1) and Communication II (COM2) requirements. The second bachelor's degree may have the same title as the first degree and may be in the same college as the first degree; but if in the same college it must be in a different major. Grades earned in all undergraduate course work (including courses applied towards a previous UW bachelor's degree) are included in the calculation of the cumulative GPA.

The minimum study requirement for a second bachelor's degree is 30 additional semester hours earned from the University of Wyoming, 12 of which must be in upper division (junior/senior-level) or graduate-level courses. However, a student must also fulfill all of the college and major requirements for the second degree. Credit by examination does not count toward UW residency. The 30 hours is in addition to the study requirement for the first degree for those students earning the

first degree from the University of Wyoming. The 30 additional hours would be added to the degree requiring the least number of hours. Both degrees may be awarded at the same commencement.

Courses applied towards one completed degree may be repeated as part of a second degree; however, the grade and GPA in the original degree will not be changed.

Students with a bachelor's degree from an accredited U.S. institution will be considered to have met the UW University Studies (USP) program requirements, with the exception of the US and Wyoming Constitution requirement, unless previously completed.

Second Bachelor's Degree Transfer Policy

Typically, undergraduate coursework from other collegiate institutions will not be loaded individually into the University of Wyoming student database after a bachelor's degree has been earned for the student. In situations in which a student who has previously earned one bachelor's degree from the University of Wyoming is subsequently required to take coursework from another collegiate institution to fulfill major and overall hour requirements for a second degree from the university, the student's department can ask the Office of the Registrar to load selected courses into the student's record. As with all students who wish to earn two bachelor's degrees from the university, the student will be required to successfully complete the following requirements:

- Major requirements for the major of the second degree
- College requirements for the college which will award the second degree
- A minimum of 30 additional semester hours over the minimum required for the student's first degree
- At least 60 earned semester hours from the University of Wyoming (30 required hours for first degree, 30 additional hours required for second degree)
- At least 54 earned semester hours of upper division (3000+- or junior/senior- level) credit (42 required upper division hours for first degree, 12 additional upper division hours required for second degree)
- At least 42 earned semester hours of upper division (3000+- or junior/senior- level) credit from the University of Wyoming (30 required upper division hours from UW for first degree, 12 additional upper division hours from UW required for second degree)

Concurrent Majors

Students may pursue a concurrent major in one or more colleges. Only one degree (BA, BS, etc.) will be awarded from the college of the primary major. All university curricular requirements, including the University Studies Program requirements, must be met only once. Requirements for secondary major(s) will be established by the academic departments and may include college requirements, in addition to all major requirements. An academic adviser in each major is required and each adviser must review requirements. The degree will be granted on one date only and only one diploma will be awarded. Both majors will be indicated on the academic transcript and diploma.

Dual Degrees

It is possible to pursue degrees in one or more colleges. The university requirements and University Studies Program requirements must be met only once. Students must meet the all college and major requirements of both majors. Students must complete an additional 30 semester hours from the University of Wyoming, 12 of which must be in upper-division (junior/senior-level) or graduate-level courses beyond the credit hour requirement for the degree with the minimum number of credit hours required. An academic adviser in each major is required and each adviser must review requirements. Multiple degrees and multiple diplomas will be awarded; however, the completion date must be the same. Both colleges, degrees, and majors will be indicated on the academic transcript.

Graduate Student Requirements

Graduate students must have a Committee Assignment (if required), a Program of Study, and Preliminary Examination Results forms (doctoral students only) on file before they may submit an Anticipated Graduation Date form. Upon receipt of the form, the Degree Analyst in the Office of the Registrar will verify that all course requirements have been met. If discrepancies are found, the Degree Analyst will contact the student with instructions on how to resolve them. The Degree Analyst will also verify that the student has registered for a minimum of one semester hour for the current semester. If there are questions, the student should contact the appropriate Degree Analyst.

Before the Defense

A formal public announcement of thesis and dissertation defenses is required. Students should contact their department for specific procedures.

Prior to the defense, the student should complete the Report of Final Examination form and take it to the defense.

After the Defense

Following the defense and when all committee signatures have been secured, the student should submit the Report of Final Examination Results form to the Office of the Registrar (note: committee chairs may delay signature until all necessary changes to the thesis/dissertation/non-thesis paperwork have been made and approved).

After submission of the Report of Final Examination Results form which indicates all changes/revisions have been made and the thesis/dissertation is approved for final submission, the student will submit the document for format review and final electronic publication to ProQuest. The student will be advised if additional corrections are required.

Ph.D. students will need to complete the NORC Survey of Earned Doctorates through the procedure noted on the Graduate Student Graduation page of the Office of the Registrar website.

Degree Evaluation/Declaring a Graduation Date

All students have an electronic degree evaluation available through WyoWeb that shows requirements of the degree program and the progress that the student is making toward meeting those requirements. Any discrepancies should be reported to a degree analyst in the Office of the Registrar as soon as possible.

Students are responsible for notifying their degree analyst of their anticipated date of graduation with an Anticipated Graduation Date form. Students are encouraged to submit the Anticipated Graduation Date form as early as possible in the expected term of graduation. Delaying this action could affect graduation, as requirements indicated on the degree evaluation must be met prior to a student being cleared for graduation.

Graduation Fee

Payment of the graduation fee of \$25.00 for each degree or certificate to be earned is due by the last day of classes from all students planning to graduate.

Grades

Final grades covering completion of course work in Distance Education, transfer, special examinations, and incomplete work from previous attendance must be submitted to the Office of the Registrar no later than the deadline for submission of final UW grades for the term in which the degree is to be conferred.

Final Approval

Final recommendation of the faculty and approval of the University Trustees for conferral of degrees is required. The trustees may, for good cause, decline to confer a degree upon any candidate.

Participation in Commencement Exercises

Commencement is not the same thing as graduation. All academic colleges hold commencement exercises on the May graduation date. Several of the colleges also have commencement exercises in December. Check the appropriate college dean's office for specific information. Students in their final year of study who have declared graduation dates are considered candidates for graduation. Students in certificate programs do not participate in commencement. **Participation in the exercise does not automatically confer degrees. Confirmation of graduation will occur after a review of final course work.**

The official graduation dates for the 2020-2021 academic year are December 12, 2020 and May 15, 2021. Please note that commencement ceremonies might be held on days other than the official date. To be eligible for a graduation date, all work must be completed prior to that date.

Commencement exercises are a historical academic custom involving participation by all segments of the university and attendance by members of the graduate's families and friends as well as the general public. Those students who participate in commencement exercises are expected to wear appropriate traditional academic regalia.

Graduation with Honors

Designations of summa cum laude, magna cum laude, and cum laude will be added to the baccalaureate academic transcripts and diplomas of graduating undergraduate students earning at least 48 credit hours from the University of Wyoming (of which 45 hours must be for A-F grades) based on the following percentages:

- Top 1% summa cum laude
- Next 4% magna cum laude
- Next 5% cum laude

as computed from the GPAs of graduating undergraduate students in each college. Honors graduates will be identified by comparison to a 5-year rolling grade point distribution computed for each college, to be recomputed annually each spring semester.

These designations are effective with the fall 2000 semester and are not retroactive.

Honor graduation will be granted for students in the College of Law upon successful completion of 56 hours in the college with a cumulative GPA of 3.400 or better based on University of Wyoming College of Law courses.

A Doctor of Pharmacy is awarded with honor by the university to a student who graduates with scholarship in pharmacy of unusual excellence as defined by the School of Pharmacy.

The University Studies Program 2015

Students who enter the University of Wyoming or a Wyoming community college beginning in fall 2015 will be required to meet the USP 2015 requirements for graduation. Requirements of the USP are divided into categories based on the student learning outcomes. All courses are mutually exclusive of each other; no single course may count in more than one category. USP designated courses are open to all UW students (with a few exceptions for the Fall Bridge and Honors Programs).

Knowledge of Human Culture, the Physical & Natural World, and the U.S. & Wyoming Constitutions Credits

Human Culture (H) 6

Students will understand human behaviors, activities, ideas, and values in different situations and contexts. Complete six approved credit hours of coursework. **Approved coursework does not include courses taken within the student's major department.**

Physical and Natural World (PN) 6

Students will understand the fundamental concepts of scientific and quantitative inquiry and develop the ability to understand the relevance of scientific, technological, and quantitative skills to contemporary society. Complete six approved credit hours of course work.

Approved coursework does not include courses taken from the student's major department.

U.S. & Wyoming Constitutions (V) 3

Students will demonstrate an understanding of the U.S. and Wyoming constitutions in order to develop the combination of knowledge, values, and motivation to participate in and improve the life of our local and global communities. Approved V courses fulfill both the U.S. and Wyoming Constitution requirements.

Intellectual and Practical Skills Credits

Communication 1 (C1) 3

Students will develop skills in written, oral, and digital communication as appropriate to specific disciplines and courses at the introductory, intermediate, and advanced level. Through repeated instruction, practice, and feedback, the communication sequence will emphasize and progressively develop transferable skills for students' academic work and future professions. The introductory course (C1) will emphasize foundational skills for academic writing. **Communication 1 must be completed with a C or better.**

Communication 2 (C2) 3

Intermediate courses (C2) will emphasize foundational oral and digital communication skills and continue to build on writing skills.

Successful completion of C1 is required prior to enrolling in a C2 course. This category can be fulfilled by courses taken from the student's major department. **Communication 2 must be completed with a C or better.**

Communication 3 (C3) 3

Advanced courses (C3) will emphasize using the discourse of a discipline or interdisciplinary field to communicate to academic or professional audiences through written, oral, and digital communication. Successful completion of C2 is required prior to enrolling in a C3 course. This category can be fulfilled by courses taken from the students' major department.

First-Year Seminar (FY) 3

Students will critically examine and evaluate evidence, claims, beliefs, or points of view about meaningful, relevant issues. Students will be introduced to active learning, inquiry of pressing issues, and individual and collaborative processing of ideas through the First-Year Seminar curriculum. These skills will be reinforced throughout the baccalaureate experience. The First-Year Seminar will provide the skills and philosophy necessary for success as a student and life-long learner. Students will have an opportunity to select from a wide range of academic courses covering unique and interesting subject matter focused on developing critical thinking, communication, and information literacy skills. Colleges, departments, and programs cannot require a particular FY class for a major. **First-Year Seminar must be completed with a C or better.**

Quantitative Reasoning (Q) 3

Students will reason and solve quantitative problems from a wide array of authentic contexts and everyday life situations. All students must fulfill the Q requirement, either through successfully completing the Q course or with SAT Math 600+, ACT Math 26+, or a *proctored MPE* Level 4.

Personal & Social Responsibility Credits

No mandatory USP courses. Students will have varied experiences depending on coursework and co-curricular activities chosen by them.

Wyoming Community colleges have defined a Common General Education Core Curriculum as a component of an associate's degree. Per transfer policy, an AA or AS or AB degree from a Wyoming community college will satisfy the lower-division requirements of the University Studies Program. Students transferring to UW from any Wyoming community college without an associate's degree will have their transcript reviewed on a course-by-course basis.

Students who enrolled at the University of Wyoming or a Wyoming community college prior to the fall of 2015 and who maintained continuous enrollment have the option of satisfying USP 2003 or USP 2015 requirements.

The following courses were approved for the University Studies Program 2015 at the time this catalog went to press. The process of course approval is ongoing. For a complete and updated list of approved courses, see the USP web site at www.uwyo.edu/unst/usp2015/.

Communication 1 (C1)

ENGL	1010	College Composition and Rhetoric
ESL	1210	English Composition for International Students
HP	1020	Freshman Colloquium I
Communication 2 (C2)		
A&S	2100	Scientific Communication
AAST	2240	Introduction to African Studies
AAST	2360	African American History, 1619-Present
AAST	2450	Traditional African Religions
ANTH	2000	Introduction to Linguistic Anthropology
ARBC	3060	Communicating in Arabic
ART	3710	Gender and Humanities
CHIN	3055	Business Chinese I
COJO	2010	Public Speaking
COJO	2095	Persuasive Arguments
ECON	2400	Economics of the Environment
EDST	3000	Teacher as Practitioner
ENGL	2005	Technical Writing in the Sciences
ENGL	2015	Composition & Rhetoric II: College & Career
ENGL	2020	Introduction to Literature, Media, & Culture
ENGL	2025	Introduction to English Studies
ENGL	2030	Critical Reading & Writing
ENGL	2035	Writing for Public Forums
ENGL	2125	Writing Tutor Pedagogy & Practice
ENGL	3710	Gender and the Humanities
ENR	2000	Environment and Society
ENR	3300	Environmental Policy, Conservation, and Development in India
ERS	2500	Communication Across Topics in Energy Resource
ESL	3050	Advanced Academic Writing for International Students
FCSC	2200	Professionalism and Communication in Family and Consumer Sciences
FREN	3050	Third Year French I
GEOG	2220	Communication Earth Science
GERM	3050	Third Year German I
HIST	2320	History of Islam
HIST	2360	African American History, 1619-Present
HP	2020	Freshman Colloquium II
INST	2240	Introduction to African Studies
INST	2250	Introduction to Latin American Studies
INST	2280	Introduction to European Studies
KIN	3012	Teaching Laboratory I
LANG	2150	Manga: History & Culture
LBRY	3020	Research as Social Capital
MKT	3310	Fundamentals of Professional & Technical Selling
ORTM	2050	Planning, Design, & Delivery
POLS	2200	Politics of Europe
POLS	3600	American Political Thought
POLS	3680	Introduction to Empirical Political Analysis
RELI	2200	Contemporary American Religion
RELI	2320	History of Islam
RELI	2450	Traditional African Religions
RELI	3245	Christianity Since Darwin
REWM	4530/ 4830	Ecological Applications and Seminar
RUSS	3050	Third Year Russian I
SELL	3310	Fundamentals of Professional & Technical Selling
SPAN	3030	Spanish for Heritage Speakers
SPAN	3050	Third Year Spanish I

THEA	2060	Introduction to Performance Studies
UWYO	1600	Veterans Transition Group
WMST	2500	Gender and Society
WMST	3710	Gender and Humanities
ZOO/ENR	2450	Fish & Wildlife Management in the Anthropocene

Communication 3 (C3)

AAST	4100	African American Religious Culture
AAST	4160	African Rhetoric
AAST	4233	Race, Ethnicity, Gender and Media
AAST	4260	Rhetoric and Social Justice
AECL	4990	Agroecology Seminar
AGEC	4965	Agribusiness Entrepreneurial Management and Communication
AGEC	4970	Technical Communication for Agribusiness Majors
AGRI	4600	Developing Organizational Leaders
ANSC	4630	Topics and Issues in Animal Science
AMST	4985	Senior Seminar
ANTH	3300	Ethnographic Methods
ARE	3210	Civil Engineering Materials
ART	3490	Philosophy, Theories, and Contemporary Issues in Art Education
ART	4010	Contemporary Art: Theory and Practice
ART	4600	Professional Practices and Strategies
ART	4790	Art History Seminar
BOT	4100	Scientific Communication
BOT	4101	Scientific Communication Lab
CE	3210	Civil Engineering Materials
CHE	4080	Process Design II
CHEM	4010	Communication in Chemistry
COJO	3010	Business and Professional Communication
COJO	3190	Cross Cultural Communication
COJO/ENGL	4061	Rhetorical Theory & Criticism
COJO	4110	Feature Writing Seminar
COJO	4160	African Rhetoric
COJO	4233	Race, Ethnicity, Gender and Media
COJO	4260	Rhetoric and Social Justice
ECON	4240	Evolution of Economic Ideas
EDEL	4109	Elementary Humanities Education
EDEL	4309	Elementary Literacy Education
EDEL	4409	Elementary Math/Science Education
EDSE	4270	Subject Matter Specific Methods II: Secondary English Education
EDSE	4271	Subject Matter Specific Methods II: Secondary Mathematics Education
EDSE	4273	Subject Matter Specific Methods II: Secondary Social Studies Education
EDSE	4275	Subject Matter Specific Methods II: Secondary Science Education
EDSE	4276	Subject Matter Specific Methods II: Secondary Modern Language Education
EDSE	4278	Subject Matter Specific Methods II: Secondary Agriculture Education
EE	4820	Senior Design I
EE	4830	Senior Design II
ENGL	3020	Culture, Communication, and the Workplace
ENGL	4000	21st Century Issues in Professional Writing
ENGL	4010	Technical Writing in the Professions
ENGL	4025	Writing for the Web
ENGL	4030	Writing for Magazines
ENGL	4040	Rhetoric, Media, and Culture
COJO/ENGL	4061	Rhetorical Theory & Criticism
ENGL	4075	Writing for Non-Profits
ENGL	4999	Senior Seminar
ENR	4900	ENR Policy in Practice

ERS	4135	Advanced Oil & Gas Law
ESE	4060	Systems Design I
ESL	4010	Technical Writing for International Students
ESS	4950	Exploring the Earth System
FCSC	4182	Textile Industry and the Environment
FREN	4200	Introduction to Research
GEOL	4820	Capstone
GERM	4200	Introduction to Research
HIST	4030	Senior Capstone Seminar
HP	4990	Undergraduate Education Research
INST	4950	Capstone
KIN	4080	Assessment in Physical Education
MATH	4200	Analysis 2: Advanced Analysis
MATH	4510	Algebra II: Introduction to Group Theory
ME	4060	Systems Design I
MGT	4800	Business Strategy & Policy
MICR	4130	Mammalian Pathobiology
MICR	4321	Microbiology Capstone
MLSK	4860	Laboratory Management
MOLB	4320	Investigations in Molecular Biology
MUSC	4330	Baroque Period
MUSC	4465	Instrumental Music Methods
NURS	4055	Evidence-Based Nursing for the RN
NURS	4125	Evidence-Based Nursing
ORTM	4903	Capstone
PATB	4130	Mammalian Pathobiology
PETE	4736	Petroleum Engineering Design
PHCY	6102	Biopharmaceutics and Pharmacokinetics
PHCY	6241	Organizational and Societal Issues Within the Health Care System
PHCY	6245	Patient/Professional Interactions
PHCY	6470	Internal Medicine I
PHCY	6471	Internal Medicine II
PHCY	6473	Ambulatory Pharmaceutical Care
PHCY	6485	Reflective Learning In Pharmacy
PHYS	3650	Advanced Modern Physics Lab
POLS	4840	Seminar in Public Law
POLS	4850	Seminar in American Political Institutions
POLS	4870	Seminar in International Relations: Comparative Genocide
POLS	4890	Seminar in Comparative Government & Politics
RELI	4000	Theories in Religion
RELI	4100	African American Religious Culture
REWM	4900	Rangeland Management and Planning
SOWK	4570	Social Work Research Methods
SPAN	4200	Introduction to Research
SPPA	4750	Research Methods in Communication Disorders
THEA	4200	20th Century Dance
THEA	4330	History of American Musical Theatre
THEA	4930	Theatre History I
UWYO	3600	Campus to Career
UWYO	4101	Bachelor of General Studies Capstone Design
WMST	4233	Race, Ethnicity, Gender and Media
WMST	4700	Feminist Theories
ZOO	4100	Scientific Communication
ZOO	4101	Scientific Communication Lab

First-Year Seminar (FY)

ACES	1101	The New Geography of Jobs
AECL	1101	Pest, Plagues, and Plants
AGEC	1101	Public (mis)perceptions of agriculture
AMST	1101	Cultures of College
ANSC	1101	Beyond Cowboys & Critters: The Science of Animal Agriculture
ANTH	1101	Anthropology of Monsters
ANTH	1101	Hoaxes, Myths, and Charlatans in Archaeology
ART	1101	Reading Tex(tiles): Exploring Fabric as a Vehicle for Communication
ART	1101	Build Your Own Camera
ATSC	1101	Weather, Climate, and Global Change
BOT	1101	Paleontology's Great Debates
BOT	1101	Fish & the Human Experience
BUSN	1101	Decision Making in Business
CE	1101	Engineering Earth's Water
CHIN	1101	A Taste of China: Travel, Food, and Culture
CNSL	1101	E.P.I.C. Leadership
COJO	1101	Small Group Communication
COJO	1101	Trending Now: Media Literacy in the 21st Century
COJO	1101	Understanding Human Communication
COSC	1101	The Beauty and Joy of Computing
CW	1101	The Power of Story: How Narrative Shapes Our Understanding of the World
ENGL/HP	1101	Travel Writing: From Wyoming to the World
ECON	1101	Viking Economics
ECON	1101	Business of Sports
EDEC	1101	Borders, Barriers, and Bridges: Creating Community Across Global Issues
EDEL	1101	Race & Racism
EDSE	1101	Superheroes, Stan Lee, and Studying for Success: What does popular culture have to do with research?
EDST	1101	Fight the Power: Diversity and Social Justice
EDST	1101	The Citizen Factory: Schooling and Democracy in the US
EDST	1101	So You Want to be a Superhero? Exploring the Teaching Profession
EE	1101	Bits & Bytes: A Taste of Electronics
ENGL	1101	Night of the Living Film: Zombies, Living Dead, Walkers... Humans
ENGL	1101	Conceptualizing Adulthood & Adolescence in 21st Century America
ENGL	1101	Video Game Theory
ENGL	1101	Reading Jane Austen
ENGL	1101	Literature of Family Home & Belonging
ENR	1101	Thinking Like a Mountain: Environmental Problems, Interdisciplinary Solutions
ERS	1101	Energy, Environment, and Economics
ES	1101	Introduction to Engineering Study
ES	1101	Innovation & Entrepreneurship
ES	1101	Mission to Mars &
FCSC	1101	People, Place, Profit and Policy: Sustainability and Well-Being in the Built Environment
FIN	1101	Personal Finance
GEOG	1101	Surviving the Apocalypse: The Geography of Natural Disasters
GEOL	1101	Water Planet
GEOL	1101	Man and Geology: The Control of Nature
GERM	1101	Ger-Merican Dreams: The German Cultural Presence in the US
HIST	1101	Hamilton's America: Beyond the Musical
HLSC	1101	Aging in America
HP	1101	Calling Bull\$#!% in a science-driven world

HP	1101	Narrative of Success: Moving Beyond Achievement to Define Meaningful Success	ART	1000	Art & History of Culture
HP	1101	A Walk Across the World: Popular Film, International Inquiry, and Problem-based Learning	ART	2010	Art History Survey I
INST	1101	Exploring the Middle East: Camels, Hookahs and Oil	ART	2020	Art History Survey II
INST	1101	Viking Economics	ART	3030	History of Architecture
ITEC	1101	Are you naked online? Taking control of your digital image	CHIN	1010	First Year Chinese I
ITEC	1101	Making, Hacking, and Tinkering: Creating in the Modern World	CHIN	1020	First Year Chinese II
KIN	1101	Kinesiology - the Science of Human Movement	CHIN	3160	See Movies, Touch China
LANG	1101	Food, Culture, Language	CLAS	2020	Classical Greek Civilization
LTST	1101	Latina/o Popular Culture: Art, Theatre, Media, Music and Sports	COJO	1000	Introduction to Mass Media
MATH	1101	Infinity---Beyond?	COJO	1030	Interpersonal Communication
MOLB	1101	The Neanderthal and the nucleus; the molecular biology of being human	ECON	1000	Global Economic Issues
NURS	1101	Should Health Care Fly?	ECON	1010	Principles of Macro Economics
PATB	1101	One Health: People, Animals, and the Environment - Zero Degree of Separation	ECON	1020	Principles of Micro Economics
PHIL	1101	Philosophy as a Way of Life	ECON	1300	Oil: Business, Culture, and Power
PHIL	1101	Social Justice and Ethics	ECON	1400	Sports Economics
PHCY	1101	Navigating Survival: A Compass for Campus Mental Health	EDEL	2280	Literature for Children
PHYS	1101	Natural History: Past, Present, & Future	EDST	2450	Foundations for Development and Learning
PHYS	1101	What really happened: How scientific theories come about	EDST	2480	Diversity and the Publics of Schooling
PHYS	1101	Critical Thinking Through Science and Science Fiction	ENGL	1080	Intro to Women's Studies
PLNT	1101	Eating as an Agricultural Act	ENGL	2360	Mexican-American Literature
POLS	1101	Dangerous Ideas: First Amendment Civil Liberties in Theory and Practice	ENGL	2410	Literary Genres
RELI	1101	Worlds of Religion	ENGL	4470	Chicano Folklore
RELI	1101	Gilgamesh to the Bomb	ENGL	4640	Chicana Perspectives
SPAN	1101	Food, Culture, Language	ENR	2345	Natural Resource Ethics
STAT	1101	The Power of Confidence	ENR	3000	Approaches to the ENR Problem Solving
THEA	1101	Performance as Change	ERS	1300	Oil: Business, Culture, and Power
UWYO	1101	The Challenge of Sustainability: Project-Based Learning	ES	3010	Culture & Engineering in Latin America
UWYO	1101	Ignite Your Passion: Creating Change Through Service and Action	FCSC	1165	Introduction to Fashion & Dress
UWYO	1101	Outdoor Leadership	FCSC	1180	Applied Design
UWYO	1101	Where Do I Belong? A Personal Odyssey	FCSC	3220	Multicultural Influences on Children and Families
UWYO	1101	Learning from the Masters: The Power of Seeing	FREN	1010	First Year French I
WMST	1101	Sex and the International City	FREN	1020	First Year French II
ZOO	1101	The Biology of Food	FREN	2030	Second Year French I
ZOO	1101	Natural History: Past, Present, and Future	FREN	2040	Second Year French II
Human Culture (H)			FREN	2130	Contemporary French Culture
AAST	3000	African American Music	GEOG	1000	World Regional Geography
AAST	3260	African Spirits in the New World	GEOG	1020	Human Geography
AAST	3933	African Philosophy	GEOG	2385	Chicano History: 1900 to Present
AGEC	1010	Principles of Macro Economics	GEOG	2370	Chicano/a History Origins to 1900
AGEC	1020	Principles of Micro Economics	INST/GEOG 4560 (H)		Global Cities
AGEC	3860	World, Food, Agriculture, and Development	GERM	1010	First Year German I
AGEC	4600	Community Economic Analysis	GERM	1020	First Year German II
AMST	2010	Introduction to American Studies	GERM	2030	Second Year German I
AMST	2110	Cultural Diversity in America	GERM	2040	Second Year German II
AMST	4430	Queer Theory	GERM	3060	Introduction to German Literature
ANTH	1200	Introduction to Cultural Anthropology	HIST	1110	Western Civilization
ANTH	1450	World Archaeology	HIST	1320	World History to 1750
ANTH	2600	Forgotten Africa: Introduction to African Civilizations	HIST	2225	History of Christianity
ANTH	3400	Hunters & Gatherers	HIST	2250	American Religious History I
ARBC	1010	First Year Arabic I	HIST	2252	American Religious History II
ARBC	1020	First Year Arabic II	HIST	2315	History of Non-Western Religions
ARE	3030	History of Architecture	HIST	2370	Chicano/a History Origins to 1900
			HIST	2380	Latin American Civilizations
			HIST	2385	Chicano History: 1900 to Present
			HIST	2600	Forgotten Africa: Introduction to African Civilizations
			HIST	4340	Social History of American Women
			HIST	4405	American Encounters to 1850
			HIST	4406	American Encounters from 1850
			HIST	4410	American in an Early Modern World
			HIST	4415	Entangled Worlds, Entangled Lives: Indigenous People and Colonizers before 1850
			HIST	4462	American Indian History to 1783
			HIST	4463	American Indian History to 1890
			HLED	1006	Personal Health
			HP	1151	Colloquium I

HP	3151	Japanese Modern Culture and Society	RELI	3090	Middle East and Israel in Film
HP	2151	NW: Classical Islam	RELI	3200	Religion and American Culture
HP	3151	Not So Plain Tales from India: Indian Short Story	RELI	3260	African Spirits in the New World
HP	2153	Bali: Life and Art	RNEW	2345	Natural Resource Ethics
HP	2153	Being Basque: Old World and New	SOC	1000	Sociological Principles
HP	3151	The Disney Discourse	SPAN	1010	First Year Spanish I
HP	3151	Art and Environment	SPAN	1020	First Year Spanish II
HP	3151	Modes: Taboo: Sacred and Forbidden	SPAN	2030	Second Year Spanish I
HP	3151	How to Think About What to Think	SPAN	2040	Second Year Spanish II
HP	3151	Christians & Muslims	SPPA	2110	American Sign Language I
HP	3152	Mass Media & Collective Consciousness	SPPA	2120	American Sign Language II
HP	3152	Children's Film	SPPA	4070	Deaf Studies
HP	3152	Race & Racism	THEA	1000	Introduction to Theatre
HP	3152	Taking Liberties with Freedom	THEA	1100	Beginning Acting
HP	3153	Art & Culture of Hip Hop	THEA	1410	Ballet I/I
HP	3153	Culture, Language & Tradition in Modern Mexico	THEA	1420	Ballet I/II
HP	4151	Concepts of Holy War	THEA	1430	Modern Dance I/I
HP	4152	Issues and Choices: Futurism 001	THEA	1440	Modern Dance I/II
INST	1060	World Regional Geography	THEA	1480	Beginning Jazz Dance
INST	3933	African Philosophy	THEA	2200	Backgrounds of Dance
INST/GEOG	4560 (H)	Global Cities	THEA	2480	Jazz II
JAPN	1010	First Year Japanese I	WIND	2100	Introduction to Disability Studies
JAPN	1020	First Year Japanese II	WIND	2700	Gender and Disability
KIN	2050	Socio-Cultural Aspects of Physical Activity, Exercise and Sport	WMST	1080	Intro to Women's Studies
LATN	1010	First Year Latin, I	WMST	2000	Intro to LGBTQ/NS Studies
LATN	1020	First Year Latin, II	WMST	2700	Gender and Disability
LTST	1300	Intro to Latina/o Studies	WMST	3200	Chicana Perspectives
LTST	2360	Mexican-American Literature	WMST	4430	Queer Theory
LTST	2370	Chicano/a History Origins to 1900			Physical and Natural World (PN)
LTST	2385	Chicano History: 1900 to Present	AECL	1000	Agroecology
LTST	3200	Chicana Perspectives	ANTH	1100	Introduction to Biological Anthropology
LTST	4470	Chicano Folklore	ANTH	1300	Introduction to Archaeology
MUSC	1000	Intro to Music	ASTR	1050	Survey of Astronomy
MUSC	1390	Jazz Ensemble I	ASTR	1070	The Earth: Its Physical Environment
MUSC	1400	Collegiate Chorale I	ASTR	2310	General Astronomy I
MUSC	1405	Singing Statesmen I	ASTR	2320	General Astronomy II
MUSC	1415	Bel Canto I	ATSC	2000	Introduction to Meteorology
MUSC	1417	Civic Chorus I	ATSC	2100	Global Warming: The Science of Humankind's Energy Consumption
MUSC	1430	Symphony Orchestra I	ATSC	2200	Severe & Unusual Weather
MUSC	3390	Jazz Ensemble II	CHEM	1000	Introductory Chemistry
MUSC	3400	Collegiate Chorale II	CHEM	1020	General Chemistry I
MUSC	3405	Singing Statesmen II	CHEM	1030	General Chemistry II
MUSC	3415	Bel Canto II	CHEM	1050	Advanced General Chemistry I
MUSC	3417	Civic Chorus II	CHEM	1060	Advanced General Chemistry II
MUSC	3430	Symphony Orchestra II	ENR	1000	Energy and Society
MUSC	4350	History and Literature of Jazz	ENR	1200	Environment
MUSC	4490	History of Rock and Roll	ENR	1500	Water, Dirt and Earth's Environment
NAIS	4462	American Indian History to 1783	ENTO	1000	Insect Biology
NAIS	4463	American Indian History to 1890	ERS	1000	Energy and Society
PHIL	1000	Introduction to Philosophy	GEOG	1010	Introduction to Physical Geography
PHIL	2300	Ethics in Practice	GEOL	1050	Gold and the American West
PHIL	2345	Natural Resource Ethics	GEOL	1060	Geology of the National Parks
PHIL	3933	African Philosophy	GEOL	1070	The Earth: Its Physical Environment
PSYC	1000	General Psychology	GEOL	1100	Introduction to Physical Geology
RELI	1000	Introduction to Religion	GEOL	1450	Solving Problems for a Sustainable Future
RELI	2050	Religions of Asia	GEOL	1500	Water, Dirt and Earth's Environment
RELI	2110	Introduction to the Old Testament	GEOL	1650	The Water-Energy-Climate Nexus
RELI	2150	New Testament Survey	GEOL	3600	Earth and Mineral Resources
RELI	2225	History of Christianity	GEOL	3650	Energy for Society: Addressing the Energy Grand Challenge
RELI	2250	American Religious History I	GIST	2160	Survey of Remote Sensing Applications
RELI	2252	American Religious History II	HP	3151	Chaos, Fractals, and Complexity
RELI	2315	History of Non-Western Religions	HP	3152	DNA in Society
RELI	2330	Islam in the Modern World			
RELI	2410	Varieties of Non-Belief			

HP	4151	We Are What We Eat
HP	4152	HIV/AIDS
HP	4152	Earth, Energy, and Culture in Scotland
LIFE	1002	Discovering Science
LIFE	1003	Current Issues in Biology
LIFE	1010	General Biology
LIFE	1020	Life Sciences
PHYS	1050	Concepts of Physics
PHYS	1090	Fundamentals of the Physical Universe
PHYS	1110	General Physics I
PHYS	1120	General Physics II
PHYS	1210	Engineering Physics I
PHYS	1220	Engineering Physics II
PLNT	2025	Horticultural Science
RNEW	1000	Wyoming Wildlands: Science & Stewardship

Quantitative Reasoning (Q)

COSC	1015	Introduction to Programming for Data Science
GEOL	2120 (Q)	Quantitative Geo-methods
LIFE	2100	Research & Analysis
MATH	1000	Problem Solving
MATH	1050	Finite Mathematics
MATH	1105	Data, Probability, & Algebra for Elementary School Teachers
MATH	1123	Math, Music and Acoustics
MATH	1400	College Algebra
MATH	1405	Trigonometry
MATH	1450	Algebra and Trigonometry
MATH	2200	Calculus I
MATH	2205	Calculus II
MATH	2350	Business Calculus
STAT	2000	Statistics and the World
STAT	2050	Fundamentals in Statistics
STAT	2070	Introductory Statistics for the Social Sciences

U.S. and Wyoming Constitutions (V)

ECON	1200	Economics, Law, and Government
HIST	1211	US to 1865
HIST	1221	US from 1865
HIST	1251	History of Wyoming
HP	1200	People in Policy: Situation American Identity & Meaning Within US Law
POLS	1000	American and Wyoming Government
POLS	1100	Wyoming Government*

* will only meet Wyoming portion of V requirement. Will be able to use this in combination with US Constitutions course (transferred)

Enrollment Management

Kyle Moore, Associate Vice Provost

Admissions Office

Shelley Dodd, Director of Admissions

150 Knight Hall, (307) 766-5160

Web site: www.uwyo.edu/admissions

A new undergraduate student's first official contact with the University of Wyoming is often through the Admissions Office. This unit is responsible for recruiting/admitting undergraduate students to the university. Responsibilities include the development of effective school relations, programs with high schools and community colleges, recruitment of prospective freshmen and undergraduate transfer students, and the orientation of new undergraduates. The Admissions Office determines initial scholarship eligibility for all new undergraduate students. This office also facilitates the admission process for graduate students. A detailed description of admission to the university and procedures can be found in the admission policies section of this publication.

Office of the Registrar

Kwanna King, Registrar

167 Knight Hall, (307) 766-5272

Web site: www.uwyo.edu/registrar

The Office of the Registrar is responsible for overseeing course registration, transcripts, verification of enrollment, adding/dropping/withdrawing from courses, administering the residency policy for tuition classification purposes, and for maintaining student academic records. This involves responsibility for web registration, as well as preparation and electronic publication of the *Class Schedules* and *University Catalog*. The office is also responsible for the electronic degree audit program, graduate record processing, and for determining whether or not students have successfully met all degree requirements. Additionally, this office evaluates all transfer credit for undergraduate students to determine transferability as well as UW equivalents.

Transfer Success Center

Amanda Reeder, Director

Knight Hall, Rooms 231, 232, 240

E-mail: transfer@uwyo.edu

Web site: www.uwyo.edu/transfer/

The Transfer Success Center provides assistance, referrals and advocacy to enhance transfer students opportunities for strong academic performance and smooth transition to the University of Wyoming. The office works closely with Undergraduate Admissions, the Office of the Registrar, Wyoming Community Colleges and out of state institutions to implement effective policies to streamline the transfer process. The office facilitates articulation efforts including programmatic articulation agreements and transfer planning guides. Additionally, the office provides student support services through peer mentors, the Reverse Transfer Program and Transfer Advance.

Office of Scholarships and Financial Aid

Debra Tolar Hintz, Director

174 Knight Hall, (307) 766-2116

Web site: www.uwyo.edu/SFA

The Office of Scholarships and Financial Aid assists students in obtaining funds to attend the University of Wyoming by coordinating and administering all forms of financial assistance to students. Four broad categories of aid are available: scholarships, grants, loans, and work-study employment. Over 1,000 different scholarship programs, funded through federal, state, institutional, and private sources, are coordinated. Federal Pell, and Federal Supplemental Educational Opportunity Grants are available to undergraduate students with significant financial need, who are pursuing a first bachelor's degree. Hathaway Scholarships, Federal Perkins, Federal Direct and Federal Direct PLUS Loans are available to qualified students. Federal Work-Study employment is available to students with a qualifying level of financial need. For additional information, please refer to the Scholarships and Financial Aid section in this catalog.

Global Engagement Office

(307) 766-3677

Web site: uwyo.edu/geo

The Global Engagement Office (GEO) is the home of internationalization at the University of Wyoming. Units within the GEO include Associate Vice Provost for Global Engagement, Center for Global Studies, International Students & Scholars, Education Abroad, and English Language Center. Whether recruiting and supporting international students, providing exchange and study abroad opportunities, facilitating global partnership development, coordinating immigration for new international hires, or assisting with visiting dignitaries, we support the entire UW campus community in achieving their internationalization goals. Stop by and visit us in the Cheney International Center to learn more about the programs and services we offer to the UW campus community to promote global citizenship, inform visitors, and communicate with our partner institutions abroad.

Education Abroad

(307) 766-3677

E-mail: uwyoabd@uwyo.edu

Web site: www.uwyo.edu/uwyoabroad

The Education Abroad Office connects students from all majors and programs with international study, exchange, service and internship opportunities on six of the seven continents at hundreds of locations around the globe. Students earn UW credit towards major, minor or general education requirements on academic year, semester, summer and faculty-directed short-term programs. The Education Abroad Office is located on the first floor of the Cheney International Center. UW students with a minimum 2.750 GPA are eligible to apply to participate on a wide variety of credit-bearing programs outside of the U.S. The Education Abroad Office staff advises students individually to tailor the program to students' specific needs. Considerations are made for cost, financial aid opportunities, transfer of credit, health and safety, degree completion, country or region desired, and foreign language requirements.

UW students with a minimum 2.750 GPA are eligible to apply to participate on a wide variety of credit-bearing programs outside of the U.S. The Education Abroad Office staff advises students individually to tailor the program to students' specific needs. Considerations are made for cost, financial aid opportunities, transfer of credit, health and safety, degree completion, country or region desired, and foreign language requirements.

In addition to learning about other cultures in depth and perfecting language skills, studying abroad can be a life changing experience. Students return home with altered perspectives by developing flexibility and critical thinking skills. Students gain a greater sense of where they are from, what it is to be a citizen of the world, and what it is to be an individual. Studying abroad can help students clarify life and professional goals which leads to the development of greater direction, focus, and motivation for the remaining years of their university life and beyond.

English Language Center

Frederica Suess, Director

(307) 766-3630

Web site: www.uwyo.edu/elc

The English Language Center offers full-time academic English preparation for international students in the Intensive ESL Program. The ELC also provides short-term English Language training and study tour options for international visitors.

International Students and Scholars

Jill Johnson, Associate Director of Admissions

Cheney International Center, Suite 5, (307) 766-5193

Web site: www.uwyo.edu/ISS

International students, numbering over 825 from nearly 90 countries, are a vital part of international education at the University of Wyoming. As such, International Students and Scholars (ISS) works to promote an interchange of ideas and understanding from among all of the countries represented on campus. ISS is responsible for recruitment of international students and provides advising and counseling to all international students/scholars for their academic, social, personal, and immigration concerns. The office also promotes and implements social and cultural activities for international awareness and educational exchange through International Education Week, Friendship Families, American Conversation Club, international coffee hours, and other special programs. Many of these activities are coordinated through the ISS-sponsored International Resource Center in the Cheney International Center, Room 1.

International students and visitors are required to contact International Students and Scholars to confirm their arrival at the University of Wyoming and to consider the office their primary contact for further information and assistance. Students must be enrolled as full-time students each semester as required by the U.S. Citizenship and Immigration Services. The ISS e-mail address is uwglobal@uwyo.edu.

National Student Exchange: The University of Wyoming is a member of the National Student Exchange (NSE) consortium. Through NSE, students are provided an opportunity to attend one of more than 175 U.S. institutions in the NSE consortium. NSE offers a student the chance to live in another part of the United States and to travel and experience college life in different settings for an academic semester or a year under his or her normal UW tuition and fees. Financial aid is often available and academic credit is guaranteed to transfer back to UW.

For more information about the National Student Exchange, please contact International Students and Scholars, Cheney International Center, Suite 5 or call (307) 766-5193. The e-mail address is uwglobal@uwyo.edu.

Undergraduate Education

Steven Barrett, Associate Vice Provost

Advising, Career, Exploratory Studies Center

Jo Chytka, Director

222 Knight Hall, (307) 766-2398

Web site: www.uwyo.edu/aces

The Advising, Career, Exploratory Studies Center (ACES) provides a variety of services to UW students, including advising Exploratory Studies and Bridge students; providing academic support to various populations of probationary, conditionally admitted, and reinstated students; assisting students campus-wide with their career exploration, planning, and job search needs; assisting in coordinating discussions, information dissemination, and event planning between the various professional advisors and advising offices on campus; and coordinating national tests and exams through the University Testing Center in Knight Hall, Room 4.

ACES is committed to providing a comprehensive and integrated service that moves a student along a continuum of receiving academic advising, exploring academic and career options, selecting a college major, and finally, implementing his/her degree in the world of work.

Exploratory Studies and students admitted with support, placed on probation, or reinstated to the university are highly encouraged to meet with a ACES career counselor. The purpose of this meeting is to analyze the student's past academic progress and future career goals to develop a strategic plan to maximize his/her academic success and future employment opportunities. ACES also works closely with other campus offices and departments to engage students in available study skill and tutorial resources.

Students interested in engaging in career exploration activities may make an appointment to meet with a career counselor to discuss their career goals and/or confirm their choice of major. Various assessment tools that provide feedback on the match between a student's interests or personality type and the world of work, are available. ACES career specialists provide information pertaining to a broad range of career fields, internship opportunities, specific employer information, general job search strategies, and federal government application processes.

Students are advised on how to use the HANDSHAKE and EPIC database on the ACES homepage to find out about and apply for summer, internship, and permanent job opportunities. Each year numerous employer representatives from business, industry, health care, education, and government visit ACES to interview students for these types of opportunities. All information pertaining to these visits is contained in the HANDSHAKE link on the ACES homepage.

The campus wide experiential learning program SOAR is coordinated in the ACES office. Students are advised how to contribute to and utilize their own personal profile to help better prepare them for career or graduate school.

ACES hosts numerous general and specialized job fairs each year for students and alumni. Upcoming job fair dates can be found on the ACES homepage.

The University Testing Center: The University Testing Center coordinates national tests and exams and is housed in the Knight Hall basement, Room 4. Students may register to take national tests and professional school entrance exams. Information is available on the University Testing Center web site www.uwyo.edu/UTC or by calling (307) 766-2188.

Student Educational Opportunity (SEO)

Pilar Flores, Director

330 Knight Hall, (307) 766-6189

Web site: www.uwyo.edu/SEO

Student Educational Opportunity is composed of both on-campus and outreach projects with offices throughout Wyoming. These projects serve students who are first generation; income-eligible; students with cognitive, psychological or physical disabilities; ethnic minority students; and non-traditional students. SEO assists eligible students to plan and prepare for entry into higher education, succeed in the higher education environment, and graduate from college by providing academic success services, and instruction in basic skills, career, and personal development. All projects within SEO seek to increase the public awareness of the needs of ethnic minority, first generation, income-eligible students, and students with disabilities in an educational environment.

On-Campus Projects

McNair Scholars Program: The McNair Scholars Program prepares students to pursue doctoral level study. Services include intensive academic support including tutoring and academic counseling; activities related to successful application to graduate school and pursuit of financial aid opportunities; preparation for the GRE; and faculty mentoring. The capstone of the program is a paid summer research internship program which prepares students for admission to graduate level education. Students who are juniors and seniors, income-eligible and first generation college students, or who are from ethnic minority groups underrepresented in graduate education qualify for program services. The McNair Scholars Project is a federally funded TRIO project. Note: this is a graduate school preparation program; it is not a scholarship program.

Student Success Services: The Student Success Services (SSS) project offers academic support to students who are first generation college students, income-eligible, and/or individuals with disabilities. Student Success Services provides assistance with academics, personal/social choices, financial issues and pursuit of financial aid opportunities, and choice of college major and related career opportunities. The SSS project also provides its students with individual and group tutoring. All services are free to eligible participants and services are intended to help students be successful in college and to stay in college through graduation. SSS is a federally funded TRIO project.

Outreach Projects

Educational Opportunity Center: The Educational Opportunity Center (EOC) assists first generation and income-eligible adults throughout Wyoming to continue their education. Services include assistance with college and financial aid applications, career and college exploration, and GED preparation. Outreach offices are located in Casper, Cheyenne, Ethete, Rock Springs, Powell, Riverton, Gillette, Torrington, and Laramie. EOC is a federally funded TRIO project.

GEAR-UP Wyoming: The Wyoming Statewide GEAR-UP project provides services to 2,000 income-eligible pre-college students throughout the state each year. Student services include career exploration, advising and supporting students in taking a college preparation curriculum, college preparation, ACT preparation, college exploration, application, and planning, and assistance with financial aid processes and procedures. Student services are provided through GEAR-UP coordinators located at each of Wyoming's seven community colleges. The GEAR-UP grant also works with the Wyoming Department of Education in providing teacher training and school improvement initiatives. All GEAR-UP services are aimed at increasing student academic preparation and performance levels suited for post-secondary education, rates of high school graduation, rates of post-secondary education participation and graduation, and GEAR-UP student and family knowledge of post-secondary education options, high school preparation needs, and means of financing.

Upward Bound Math/Science: The Upward Bound Math/Science Program (UBMS) provides services to income-eligible and first generation 9th through 12th grade high school students throughout Wyoming. UBMS is designed to generate the skills and motivation necessary to be successful in high school and to complete a college degree program in a math or science area. Assistance with high school coursework and tasks related to college enrollment are provided throughout the academic year. The UBMS program includes a six-week, residential, summer academic session on the UW campus with an intensified math and science curriculum that includes performing active research under the guidance of university staff and graduate students. UBMS is a federally funded TRIO project.

Upward Bound: The Upward Bound program works with income-eligible, first generation high school students (grades 9-12) and their families to help them gain the skills and motivation necessary to successfully complete high school and to pursue a college degree. The program includes a six-week, residential, summer academic component on the UW campus designed to help students develop academically and socially in a university setting. Tutorial and enrichment services are provided throughout the academic year and participants and their families receive individualized assistance in completing tasks related to successful college enrollment. Outreach offices are located in Albany, Fremont, Laramie, and Natrona counties. Upward Bound is a federally funded TRIO project.

Graduate Education

James C. Ahern, Associate Vice Provost

(307) 766-4286

Web site: www.uwyo.edu/uwgrad

The Office of Graduate Education oversees and supports graduate and professional education at the university. In collaboration with Graduate Council, the Office of Graduate Education develops, reviews and implements policies and procedures regarding graduate and professional education and helps develop and review major changes to graduate and professional programs. The office also provides funding to programs and students including special initiatives, graduate assistantships, graduate fellowships and student travel. Furthermore, the Office of Graduate Education is the administrative home for interdisciplinary and transdisciplinary graduate programs.

Division of Student Affairs

408 Old Main, (307) 766-5123, Fax: (307) 766-2696

Kimberly Chestnut, Vice President

Ryan O'Neil, Dean of Students

The Division of Student Affairs is the administrative unit of the university that is responsible for providing leadership and coordination of programs and services designed to support student learning and development in and outside the classroom.

In partnership with UW faculty, staff, and students, the Division of Student Affairs develops and delivers services, programs, and facilities that promote the intellectual, personal, cultural, and civic development of students; coordinates efforts to create a caring community in which individuals are respected, encouraged to pursue excellence, and achieve their potential; and fosters honoring the diversity of individuals and cultures.

The Division of Student Affairs is comprised of the Associated Students of the University of Wyoming, Campus Recreation, Cowboy Parents Council, the Dean of Students Office, the Center for Student Involvement and Leadership, Student Health Service, the University Counseling Center, Residence Life and Dining Services, UW Catering and Events, the UW Alumni Association, and the Wyoming Conservation Corp. The different areas within the Division work together to provide safe and comfortable housing; to provide wellness services for the health of students; to educate students and encourage personal accountability; to engage students in leadership opportunities; to provide educational and entertaining programs and events; and to foster opportunities for student feedback which is essential for a successful institution.

Campus Recreation

Pat Moran, Director

Half Acre Recreation and Wellness Center

Phone: (307) 766-5586

Web site: www.uwyo.edu/Rec

Our mission is to provide recreational and wellness opportunities to a diverse campus community that enhance the learning and workplace environment and promote mental and physical health via quality facilities, equipment, and programs. Our programs, which include the Wellness Center, Open Recreation, Intramural Sports, Club Sports, and the Outdoor Program, offer a broad range of coordinated activities for individuals and groups that promote health awareness, a sense of community and a lifelong appreciation for wellness and recreational activities. Supporting the value of student development, our programs strive to offer opportunities to students that develop leadership skills and promote responsibility while maintaining a balance between personal, professional, and academic pursuits.

Wellness Center

Half Acre Recreation and Wellness Center, First Floor

Phone: (307) 766-9355

An exciting new addition to the Campus Recreation Department, the UW Wellness Center is a network of people, programs, services, and policies that work together to create and support a culture of health and wellness at UW. The UW Wellness Center works collaboratively with various campus departments to provide education, services, and programs that address health needs such as stress relief, nutrition, fitness, mental health, sexual health, safety, and alcohol and tobacco

use. Some of the Wellness Center offerings include: athletic training, massage therapy, personal training, sleep assessments, blood pressure checks, and weekly educational workshops. The Wellness Center is located in the southwest portion of Half Acre, in the "free zone," which does not require gym membership to access. The Wellness Center is open to students as well as members of the University community. Most offerings are free, however there are a few services that charge a competitive rate. Visit the Wellness Center to learn more about these programs and services aimed at improving your overall wellness.

Open Recreation

Half Acre Recreation and Wellness Center, First Floor

Phone: (307) 766-5586

The Open Recreation Program is housed primarily in the newly renovated Half Acre Recreation and Wellness Center with additional recreational opportunities in the Corbett building on the east campus. UW's Open Recreation Program, available to the entire student population, faculty, staff and spouses, provides quality equipment for individuals to participate in non-organized, informal activities such as basketball, volleyball, racquetball, or badminton. Patrons can also take advantage of swimming, weight training, aerobic training, personal training services, and group fitness and instructional classes. For more information on the Open Recreation Program, stop by the front desk in the lobby of Half Acre, pick up a Campus Recreation brochure, or visit the Campus Recreation website.

Intramural Sports

Half Acre Recreation and Wellness Center, Second Floor

Phone: (307) 766-4175

UW's Intramural Sports Program offers organized individual and team competitive sport events in men's, women's, and co-recreational leagues. Students and employees can participate in organized recreation level sport competition in approximately 30 activities per semester such as flag football, soccer, inner-tube water polo, wrestling, badminton, basketball, volleyball, or table tennis. Information is available from the Rec Sports Office or on the Campus Recreation website. Every member of the university community is encouraged to become familiar with the many aspects of intramural sports, which are designed to encourage participation and socialization regardless of previous experiences, sport skills, or group affiliation. Come alone or with a group to sign up for a fun time.

Club Sports

Half Acre Recreation and Wellness Center, Second Floor

Phone: (307) 766-4175

The Club Sports Program offers a higher level of athletic sport competition than Open Recreation and Intramural Sports to UW students. Some of the current UW Club Sport teams for men and women include badminton, baseball, volleyball, soccer, ice hockey, rugby, cycling, Nordic ski racing, lacrosse, softball, racquetball, fencing, cricket, water polo, tennis, triathlon and equestrian. UW faculty or staff with an interest in coaching or officiating a Club Sport should contact the Rec Sports office. Visit our website for more information on Club Sport teams and activities.

Outdoor Program**Half Acre Recreation and Wellness Center, First Floor****Phone: (307) 766-2402**

UW's Outdoor Program (OP) offers a variety of outdoor experiences as well as training to use the brand new indoor climbing and bouldering wall. Participants have opportunities to develop lifetime recreational skills, gain an appreciation and concern for our natural environment, and meet new people. The OP sponsors a variety of seasonal programs and outings throughout the year. These activities range from day and weekend trips to nearby destinations to extended trips at unique destinations. The OP also runs clinics and sponsors guest speakers, presentations, and other educational programs. Activities are offered for all skill levels through such venues as back country ski outings, trail running, snowshoe outings, back country hiking and camping trips, or rock climbing. The OP provides an extensive line of rental equipment to the campus community. The Outdoor Program staff is ready to expose the university community to a whole new realm of experiences not available anywhere else on campus. Visit the office or our website for more information on OP activities and services.

Dean of Students Office**Ryan O'Neil, Dean of Students****128 Knight Hall, (307) 766-3296****Web site: www.uwyo.edu/DOS**

The Dean of Students Office (DOS) provides a variety of UW student support services. The staff in DOS work to enhance the quality of life for all UW students. Assistance with situational needs and student life concerns of individual students and groups of students regarding their personal, academic, and/or social welfare are coordinated by the DOS staff.

Several offices and programs comprise the Dean of Students Office. These include the Dean of Students, STOP Violence Program, welfare check, and Student Judicial Affairs, all located in Knight Hall. The Center for Student Involvement and Leadership (CSIL) is also under the Dean of Students and is primarily located in the Wyoming Union.

Services available through the Dean of Students Office include individual advisement and consultation regarding situational student life concerns; referral coordination with other university and community services; conflict resolution and consultation regarding student conduct, rights, and responsibilities; advisement in grievance procedures, due process, and student appeals of disputed decisions; official university withdrawals; and authorized absences and emergency contacts.

The professional staff provide direct assistance to students and groups at any time in the student's career at the university. Information, individual advisement and consultation, and assistance with administrative procedures are facilitated in the Knight Hall offices.

STOP Violence Program: The mission of the STOP Violence Program is to prevent domestic/relationship violence, sexual assault, and stalking on the campus of the University of Wyoming. Awareness and prevention efforts are provided by this office through outreach and educational activities. The coordinator works closely with the University Counseling Center (UCC), Campus Police (UWPD), Residence Life, and other offices to provide programs.

Another focus of the STOP Violence Program is to provide support and resources to students affected by violence. One resource is an on-campus advocate who can help a student access services through university departments and/or community agencies. Support is also offered by providing information to these students, their friends, and

families, about the effects of domestic/relationship violence, stalking, or sexual assault. Walk-in hours are 10 a.m. to 4 p.m. weekdays, (307) 766-3296. For after hours emergencies, please call (307) 745-3556 (the Albany County Safe Project).

Student Conduct, Rights and Responsibilities: The Trustees, as a governing body of the university, are charged with the statutory duty and authority to make all rules and regulations including the administrative responsibility to regulate and control whatever conduct and behavior of the members of the university community impedes, obstructs, or threatens the achievement of the educational goals and mission of the university. The university community, in order to function in an orderly and creative manner, ascribes to a code of conduct to which the student must adhere. This information, entitled *Student Code of Conduct*, is distributed to each student who is granted admission to the university. This information and other university regulations are published in order to inform students of their rights and responsibilities and the minimum ethical standard of conduct expected of them as members of the university community. Additional copies of this information may be obtained at the Dean of Students Office or on the web.

Student Legal Services: Student Legal Services provides free, confidential legal assistance to the University of Wyoming student community through a full-time attorney. This office provides full legal service for any student need with the exception of in-court representation. The attorney can assist all fee-paying University of Wyoming students who seek advice in connection with personal legal issues. Information is readily available on a variety of subjects. This service is provided through student fees to ASUW, and there is no additional charge for the attorney's time. Student Legal Services also facilitates the effective and prompt handling of legal referrals, (307) 766-6347.

Disability Support Services: Disability Support Services (DSS) provides a variety of services for students with physical, sensory, cognitive, or psychological disabilities including printed materials in alternative format, note-taking assistance, classroom relocation, testing accommodations, access to adaptive computers, parking assistance, advocacy, sign language interpreters, real-time transcribing, mobility orientation for the blind, as well as other academic support services. UDSS assists UW to meet its legal and ethical obligations under Section 504 of the Rehabilitation Act of 1973 and the Americans with Disabilities Act of 1990. Services are coordinated with the efforts of the Division of Vocational Rehabilitation and Wyoming Services for the Visually Impaired, when appropriate. Students with disabilities who anticipate needing accommodations to fully participate in classes and programs at the University of Wyoming are strongly encouraged to register with UDSS and provide documentation of their disability.

Student Health Service**Mary Beth Bender, FNP-C, Interim Director****Student Health Building, (307) 766-2130****Web site: www.uwyo.edu/ShSer**

The Student Health Service (SHS) provides personalized health care to eligible students by maintaining a high quality medical outpatient clinic. The clinic provides primary health care, health education, and preventive services to enable students to complete their course of study. The professional staff consists of two physicians, three nurse practitioners, a psychiatric nurse practitioner, one physician assistant, and registered nurses, in addition to other professional and administrative personnel.

Undergraduate and professional full-time students taking 12 or more credit hours and graduate students taking 9 or more hours are eligible for services at the SHS. Undergraduate and graduate part-time students who have purchased the Optional Student Fee Package are also eligible. Enrollment in, or waiver from, the University of Wyoming Student Medical Insurance program has no effect on eligibility to use the Student Health Service. Students enrolled during the summer pay a summer fee for use of the SHS. Students not enrolled for summer but who were enrolled spring semester and are pre-registered for fall semester may pay the same summer fee to use the SHS. Payment of the semester fee provides visits with clinicians and nurses at no cost. Affordable laboratory diagnostic procedures, medications, and office procedures are available. There are also nominal charges for supplies such as ace bandages, splints, crutches, and other medical devices.

The hours of the Student Health Service can be found on our web site. All students are urged to have adequate health insurance coverage for illnesses or emergency visits to the local hospital, urgent care clinic, or a physician's office when the Student Health Service is closed. Insurance coverage is also recommended for medical care that is not available at the Student Health Service, including treatment of major injuries, surgery, and hospitalization. The student is responsible for all charges for services provided by persons or institutions outside of the Student Health Service.

University Counseling Center

Toi Geil, Ph.D., Director

341 Knight Hall, (307) 766-2187

Web site: www.uwyo.edu/UCC

The University Counseling Center (UCC) provides comprehensive, time-effective mental health services to the university students and consultation on issues with parents, staff, and faculty. The UCC is a resource center for students to enhance personal success skills in dealing with the challenging and sometimes stressful university environment. The professional UCC staff work together with students to help them find effective ways to approach concerns and problems. Students are supported in learning to make healthy lifestyle choices that promote their personal, social, and academic goals. Group and individual counseling services, in a professional and confidential atmosphere, are provided to students with personal and interpersonal concerns. Other services include crisis intervention, walk-in consultation, and education to the UW community. Individual counseling appointments are made in person during regular office hours, 8 a.m. - 5 p.m. (summer hours: 7:30 a.m. - 4:30 p.m.) Monday through Friday. The UCC offers walk-in services, various hours a day, when students may simply walk in to be seen for a brief appointment, to determine future services they might need. Counseling services are free to UW students. For after-hour emergencies, students can talk to an on-call counselor by calling 766-8989.

Campus Consultation and Outreach: UCC staff consults with academic and student services personnel, student leaders, and university administration regarding counseling and mental health issues and ways to better the UW living/learning environment. Outreach programs can be initiated by student or staff request or by UCC staff bringing issues of concern to various campus populations. Some current issues include destigmatizing mental health, suicide prevention, respect for diversity, sexual orientation issues, and stress management. Generally, UCC asks for a minimum of two weeks notice for an outreach presentation; however, in urgent situations triggered by trauma, outreach programs

will be offered on a shorter notice. The Center hosts the Lifesavers Coalition - a group of campus and community partners who have an interest in training others in the skills of suicide prevention, and also have a focus on how to be proactive with wellness.

UCC collaborates closely with the STOP Violence Program in the Dean of Students Office by providing counseling support to students who are victims of sexual violence as well as collaborative programming regarding prevention of sexual violence and membership with Campus Coalition for the Prevention of Sexual and Relationship Violence.

AWARE (Alcohol Wellness Alternatives, Research and Education): The AWARE Program is committed to a healthy campus community and a drug-free learning environment. AWARE Program staff utilize best practices in providing drug and alcohol education and prevention programming for the University of Wyoming campus and community. The AWARE Program promotes a standard of wellness in regard to healthy choices surrounding alcohol use and the prevention of illicit drug use by college students. To achieve these goals, the AWARE Program offers a broad range of services ranging from individual interventions to consultative and educational services for campus groups and the community at large. AWARE also coordinates the Cowboy UP Peer Education group. Additionally, the AWARE Program coordinates the A-Team, a campus-community coalition dedicated to reducing underage and excessive alcohol use. For more information, please visit the web site at www.uwyo.edu/aware or feel free to contact via telephone at (307) 766-2187, email (aware@uwyo.edu), or in person by visiting 341 Knight Hall.

Residence Life & Dining Services

Eric Webb, Executive Director, Residence Life, Dining Services, and the Wyoming Union

Reggie Conerly, Director, Dining Services

Washakie Center, Lower Level, (307) 766-3175

Web site: www.uwyo.edu/reslife-dining

Residence Life & Dining Services is committed to providing clean, comfortable and affordable housing and dining, with the belief that these elements are an essential component of a student's education, personal growth, and college experience.

The university operates six furnished residence halls, a variety of furnished and unfurnished apartments, as well as Washakie Center, ten on-campus dining establishments and UW Catering and Events.

Residence Halls: The residence halls provide convenient living, studying, educational programming, social activities and dining accommodations for the university community. Various living environments are available. Full-time, live-in professional staff and graduate assistants live in the community, along with student resident assistants. The staff is available to all students to help make residence hall living an enjoyable and productive part of campus life. We have five residence halls for students:

- Downey Hall
- Honors House
- McIntryre Hall
- Orr Hall
- White Hall

The residence halls also provide several additional services to our students:

- Laundry facilities on-site in each hall
- On-site computer labs and study rooms
- Mail service
- Free tutoring in the Student Learning Center
- 24-hour emergency custodial & maintenance services
- Upgraded cable TV that includes channels like ESPN U, HBO, The Sundance Channel, and your own HBO GO account

Room assignments are made according to the date the completed contract form is received. The housing deposit is included in the enrollment confirmation deposit paid by new UW students. Students returning to UW who wish to live in the residence halls must pay the housing deposit when they complete their housing contract. Hall, roommate, and other preferences may be indicated on the contract and will be considered. Students wishing to room together should submit contracts together prior to the posted deadline of May 1.

New Student Live-in Policy: The UW Trustees have established a policy requiring all new students to live in the UW residence halls during their first academic year on campus and to take a minimum of the 12-accesses-per-week dining plan. The policy is based on extensive student development research indicating that a student's chance of academic success and satisfaction with the college experience greatly improves through the residential living experience.

For a student to be considered for an exemption to the policy, a request with appropriate documentation must be submitted. Students will be considered exempt from the policy if they can provide documentation for one of the following:

- 21 years of age or older
- Married
- Single parent with custody of child(ren)
- Reside with parent(s) or legal guardian(s) within a 60-mile radius of Laramie or in a property purchased by parent(s) or legal guardian(s)
- Completion of two semesters as a full-time student or the equivalent credit hours at UW, or another university or college
- Have documented medical or health conditions prohibiting residence hall living

Students must apply for exemption prior to 5 p.m. the day before the halls open for the semester (August 25, 2016 for the fall 2016 semester). Housing accommodations at the University Apartments may be available for students who have children or minors living with them or students of sophomore status or above.

Dining Services: A variety of dining plans, services, and payment options are offered for on and off-campus students, faculty, and staff. Dining plans are identified by the number of times a customer may access Washakie Dining Center per week. Additional Dining Dollars can be added to any dining plan, allowing for additional meals and services at dining locations across campus.

All students living in the residence halls may choose between the "Unlimited-," any 15-, or any 12- dining plans. Students living in Hill/ Crane Halls may purchase the any-7 or above dining plan. Meals are served during the contract periods for each semester. Limited services will be available over Thanksgiving and Spring Break.

Washakie Dining Center, the social and cultural hub of the residence halls, features marketplace dining with 10 serving platforms. Meals at the Washakie Dining Center can be purchased in several ways:

- UW Student ID card (WyoOne Card)
- Dining Dollars
- Cash previously deposited to the holder's WyoOne account.
- Credit cards (VISA and MasterCard)
- Cash

Dining plans are not just for students living in the residence halls. Any student, staff member, or faculty member can purchase one of the varieties of dining plans designed to fit his/her needs.

For additional information about the residence halls, dining plans, or university apartments visit www.uwyo.edu/reslife-dining; call toll free (866) 653-0212; or if in Laramie, (307) 766-3175 (residence halls) or 766-3176 (university apartments); FAX (307) 766-3613 or email reslife-dining@uwyo.edu. Information may also be obtained by writing to Residence Life & Dining Services, Dept. 3394, 1000 E. University Ave., Laramie, WY 82071.

Campus Dining Options: In addition to Washakie Dining Center, a variety of convenient and affordable dining options are located in the Wyoming Union and throughout campus to further meet the dining needs of busy students. These locations offer unique atmospheres and customizable menu selections, with several locations open into the evening and on weekends. Each dining location accepts Dining Dollars, WyoOne card funds, Cash, Mastercard and Visa. Cash is not accepted at Elements or Encore Cafe. Plus, UW Campus Dining now offers Tapingo, a mobile food ordering application (download on your smartphone via the Apple or Google Play stores) available at most of the campus dining locations.

University Apartments: The University provides one and two-bedroom furnished or unfurnished apartments for students. Located on the east side of campus, the River Village, Landmark Village and Spanish Walk apartment communities are near shopping centers, recreational areas, and the hospital. The apartments also offer children's programs and a community center.

Apartment assignments are made on a year-round basis. The date an application is received is used in determining assignment priority. Requests should be made as early as possible after acceptance to the university.

Bison Run Village offers an on-campus living community for single students sophomore class standing or above. The fully-furnished town-home style apartments are rented by the bedroom and feature shared kitchen, dining and living room spaces with single, private bedrooms and private or semi-private bathrooms. Applications for Bison Run Village open during the spring semester for the following fall semester.

Application forms and additional information about apartment rates, availability, and eligibility guidelines may be obtained by contacting Residence Life and Dining Services, (307) 766-3176, toll free at (866) 653-0212, email reslife-dining@uwyo.edu or online at www.uwyo.edu/reslife-dining.

Off-Campus Housing: The University assumes no responsibility for the students' choice of off-campus living environment. Students living off-campus are encouraged to contract for meals with Residence Life & Dining Services.

Center for Student Involvement and Leadership (CSIL)

Jeremy Davis, Director

326 Wyoming Union, (307) 766-4008

Web site: www.uwyo.edu/CSIL

The Center for Student Involvement and Leadership (CSIL), located in the Wyoming Union, seeks to provide opportunities for on campus engagement through inclusive student-centered programs, communities, services, and experiential learning opportunities to complement the academic experience. Through CSIL, students can join or create a Registered Student Organization; volunteer for local, national, or international service projects; obtain on-campus employment; serve as a student government leader; participate in fun activities; and find community among those who are similar and different.

Associated Students of the University of Wyoming (ASUW)

020 Wyoming Union, (307) 766-5204

Web site: www.uwyo.edu/ASUW

The Associated Students of the University of Wyoming (ASUW) is comprised of three branches: the Executive, Legislative, and Judicial. All full-time, fee-paying students are members of ASUW. Officers and 32 senators are elected annually by the students, and each senator represents one of the colleges or schools. They meet weekly to consider areas of concern to students.

The ASUW student government represents student opinion to the administration, faculty, staff, and State of Wyoming legislature. ASUW participation across the university ensures that university policies are made with the concerns of students in mind. In addition, the ASUW president serves as an ex-officio (non-voting) member of the University of Wyoming Board of Trustees and conveys student opinion to the institution's highest governing body. ASUW also provides their own programs and services for students. Included in these programs are ASTEC (technical services), located in the Wyoming Union; Student Legal Services in Knight Hall; and several councils: First-Year Senate, Non-Traditional Student Council, and the United Multicultural Council.

Campus Activities Center

Erik Kahl, Associate Director,

Center for Student Involvement and Leadership

The Campus Activities Center (CAC) serves as the hub of student activities on campus. Professional staff in the office offer guidance and assistance for programming committees, late-night programming efforts, more than 250 recognized student organizations (RSOs), and student leadership development. Recognized student organizations at UW are established to promote a learning and social experience for individuals who share common interests. Students are encouraged to join and are free to organize associations that will provide opportunities to participate in educational, academic, cultural, and social activities. CAC staff are available to help students develop organizations, sponsor activities, and coordinate efforts with other entities on campus. A complete listing and descriptive classification of all current recognized student organizations is available from the CAC and online at www.uwyo.edu/rso. The CAC is also home to 7220 Entertainment, a student-run organization that plans and implements social, recreational, cultural, and educational programs for the campus community. 7220 Entertainment is composed of five committees.

Fraternity and Sorority Life

Erik Kahl, Associate Director,

Center for Student Involvement and Leadership

The fraternities and sororities at UW provide a living/learning environment designed to support the development and experience of their members. Through intentional programs, members build connections among fellow brothers/sisters and alumni, grow and develop as students and leaders, give back through services, and lead with integrity. Countless leadership opportunities can be found within each chapter, governing council, and broader FSL community.

Multicultural Affairs

Center for Student Involvement & Leadership (CSIL)

103 Wyoming Union, uwma@uwyo.edu

Multicultural Affairs serves to enhance the personal and academic growth of students through programs, services, policies, and procedures. Our focus is to advocate with and for marginalized students to develop a positive sense of self, create strong community connections, and thrive in all aspects of student life.

A variety of events, workshops, support groups, and trainings are offered throughout the academic year to support students. Multicultural Affairs also offers the Multicultural Resource Center and Rainbow Resource Center in the Wyoming Union.

The Multicultural Resource Center, located in room 103, is a place for students from marginalized and underrepresented backgrounds to find community and support. Programs and additional resources are offered throughout the year, as well as computers, printers and workstations. The Rainbow Resource Room, located in room 106, is a supportive space for our LGBTQIA students to find community and a network of support. Computers, printers, and workstations are also available in this center as well as programmatic offerings throughout the year. More information can be found at: <http://www.uwyo.edu/oma/>.

Student Media

Center for Student Involvement & Leadership (CSIL)

001 Wyoming Union, (307)766-6190

The Student Media Office is partially funded by student fees. It meets the informative, educational, and cultural needs of the university community through such publications as The Branding Iron (the daily student newspaper published Tuesday-Friday and weekly during the summer session), the literary magazine Owen Wister Review (published spring semester), and the feature magazine Frontiers (published fall and spring semesters) which are published under the auspices of the Board for Student Media.

The board is composed of students, faculty, staff, and selected members of the Wyoming Press Association. These publications provide an excellent opportunity for students to gain valuable experience in newspaper, magazine, advertising, sales, and production. More information can be found at: <http://www.uwyo.edu/studentmedia/index.html>.

Union Events**Center for Student Involvement & Leadership (CSIL)****210 Wyoming Union, (307)766-3161**

The Wyoming Union is the community center for campus life, enhancing and complementing out-of-class educational experiences. Open daily, the Union provides facilities, services, and various activities to all of the campus community. Through the Union Events office, reservations can be made for spaces in the building including meeting rooms, ballrooms, or tables in the breezeway. The Information Desk offers campus and community information and ticket sales. For reservations and information on these services, contact the Union Events Office or make a reservation online: <https://www.uwyo.edu/union/reservations/>.

Veterans Services Center**Marty Martinez****Center for Student Involvement & Leadership (CSIL)****300 Wyoming Union, (307)766-6908**

Located on the 3rd floor of the Wyoming Union, the Veterans Services Center has resources, computers, and a lounge area where veterans and their dependents, spouses, and friends can meet and support each other. Special events, programs, and student groups are coordinated out of the center. The staff works to improve access to and success in college for students who are veterans. For more information, call (307) 766-6908 or visit the web site at <http://www.uwyo.edu/vetservices/>.

Service, Leadership, and Community Engagement Office (SLCE)**Center for Student Involvement & Leadership (CSIL)****033 Wyoming Union, (307)766-3117**

The Service, Leadership, and Community Engagement Office (SLCE) is located on the lower level of the Wyoming Union. SLCE is predicated on the notion that universities have a responsibility to prepare all students for active citizenship. A healthy American democracy demands ethical, engaged leadership, and SLCE seeks to cultivate these ideals among our UW students. A complete listing of all the programs and events the SLCE Office offers can be found at www.uwyo.edu/slce/. Students are invited and encouraged to visit the office in Room 033 in the Wyoming Union to explore the many opportunities available, including:

- First Year Institute
- Alternative Breaks
- Local and national days of service
- Good Mule Project
- The Big Event
- Leadership development programs
- Community engagement programs

Other University Services

University Store

Misty Eaton, Manager

Wyoming Union, 1-800-370-2676, (307) 766-3264,

TTY: (307) 766-3267

Web site: www.uwyostore.com;

www.facebook.com/uwyostore

The University Store is a self-supporting university department founded in 1921. It provides students, faculty, staff, and campus visitors with a variety of products and services. In order to fulfill its primary mission, the store stocks new and used textbooks, textbook rentals, e-textbooks, general books, school supplies, office products, educationally priced computer software, fine art supplies and electronics. The University Store is an authorized Lenovo distributor and an Apple Authorized campus store offering a full line of Apple products and accessories. As a convenience, the store also stocks additional items such as gifts, insignia gifts and clothing, greeting cards, candy and sundries. Services the store provides include prepaid textbook reservations, bookbinding, special order book service, cap and gown rental, used book buyback, and postage stamps, as well as UPS, FAX and Federal Express.

The University Store is located on the main level of the Wyoming Union. Hours of operation during the academic year are: 7:30 a.m. to 5:00 p.m., Monday through Friday; TBA Saturday.

Music

J. Scott Turpen, Department Head

2049 Buchanan Center for the Performing Arts, (307) 766-5242

Web site: www.uwyo.edu/music

The Department of Music offers many opportunities for students to participate in musical activities, as well as, to hear concerts by faculty artists, student ensembles and visiting artists. All qualified students within the university, no matter their major, are invited to participate for credit in any of the following: Marching Band, Symphonic Band, Wind Ensemble, Symphony Orchestra, Chamber Orchestra, Collegiate Chorale, Jazz Ensemble, Bel Canto, Singing Statesmen, Civic Chorus, and the many smaller ensembles such as string ensembles, brass ensembles, percussion ensemble, and various chamber groups. Note: some ensembles are by audition only. Private lessons on any instrument and voice are available at a fee to all interested students.

Summer offerings may include lessons, workshops, seminars, and regular courses. A summer music camp for students in grades 7 through 12 is also offered which includes band, choral, orchestral and keyboard experiences culminating in gala concerts. For further information, please write to the Department of Music, Dept. 3037, 1000 E. University Ave., Laramie, WY 82071 or musicdpt@uwyo.edu.

Theatre and Dance

Leigh Selting, Department Head

2099 Buchanan Center for the Performing Arts, (307) 766-5100

Theatre and Dance at the University of Wyoming offers students an excellent opportunity to participate in all aspects of theatre and dance arts. Auditions for productions are open to all qualified students within the university regardless of major or college. The production program provides opportunities for students to participate in technical theatre

stage crews, set construction, costuming, lighting and sound. There are also opportunities to perform dance, drama, musicals and operas. Playwriting, screen writing, directing and choreography are available through upper-division courses. The BCPA contains a proscenium theatre, an experimental theatre, a thrust theatre, an acting for the camera studio and two dance studios, plus full support facilities for scene and costume construction. Full-time university students may purchase tickets through the Fine Arts Ticket Office at a greatly reduced price.

University Police Department

Mike Samp, Chief of Police

1426 E. Flint, (307) 766-5179

Web site: www.uwyo.edu/UWPD

The University Police Department is responsible for crime prevention, public safety, and law enforcement in the UW community. The department is staffed by 15 certified peace officers, five security guards, and eight full-time staff members. All officers are fully trained and have arrest authority. The department operates 24 hours per day, 365 days a year. To keep members of the UW community aware of police activity on campus, the department maintains a chronological log of all incidents reported to the department. This log is open for public inspection through the UWPD web site. University crime reports are also included annually in the United States Department of Justice publication, Crime in the United States. Crime statistics, as well as other public safety information, are included in the Annual Security/Clergy Report, which is available online. Department personnel present public safety programs upon request to any group or organization. Further information is available through the UWPD World Wide Web site.

Bicycle Regulations The University of Wyoming Bicycle Program was developed to promote an environment in which bicycles, pedestrians, and motor vehicles can safely co-exist. Persons riding bicycles are asked to familiarize themselves with the regulations and bike paths described in the pamphlet *Safe Cycling at UW*, which is available on the University Police Department web site. All bicycles must be registered.

University of Wyoming Alumni Association

Keener Fry, Executive Director

222 South 22nd Street, (307) 766-4166

Web site: www.uwyo.edu/alumni

The University of Wyoming Alumni Association has served the university and alumni since the association was first organized in 1895. Our purpose is to provide the pathways to share the legacy, spirit and pride of UW worldwide. The primary role of the UWAA is to connect and reconnect alumni to the institution and each other through effective communication and meaningful engagement. The Alumni Association creates partnerships that advance UW and enrich the lives of students and alumni worldwide.

The Alumni Association currently serves over 131,000 former students of the University of Wyoming. Daily operations include high performing programs which include the admitted student writing project, employer engagement through full time job opportunities and internships, Cowboy 2 Cowboy Informational interviews, chapter and network gatherings, campus partnerships and donor cultivation and stewardship. The scholarship program services Wyoming and out-of-state high school seniors, undergraduate and graduate students, non-

traditional students, Wyoming community college transfer students, US Veterans, and multicultural and Native American students with a commitment of over \$187,000 annually.

The UWAA sponsors the UW Homecoming Parade and senior send-off.

The Alumni Association is located in the Alumni Center at the Marian H. Rochelle Gateway Center.

Cowboy Parents

Division of Student Affairs

408 Old Main, (307) 766-5123

Web Site: www.uwyo.edu/cowboyparents

Cowboy Parents is an organization that provides parents and families with their own University of Wyoming connection serving as a conduit for information and assistance. Cowboy Parents offers opportunities for families to get involved with the goal of promoting student success while also providing the institution with a unique perspective from parents and families. Cowboy Parents provides email updates, frequent and timely publications, volunteer opportunities, and much more.

University of Wyoming Extension

Kelly K. Crane, Associate Dean, Director

103 Agriculture Building, (307) 766-5124

The 1914 Smith-Lever Act created the University of Wyoming Extension, stating that its purpose was to “provide instruction and practical demonstrations in agriculture, home economics and related subjects.” The University of Wyoming Extension is part of a national educational network which establishes partnerships with the United States Department of Agriculture, the state of Wyoming, the University of Wyoming, and county and tribal governments. UW Extension maintains offices in 27 Wyoming communities.

The mission of the University of Wyoming Extension is to provide lifelong learning opportunities for the people of Wyoming and empower them to make choices that enhance their quality of life. To accomplish its mission, the UW Extension continually updates its programs to meet the changing priorities, organizational structures and external relationships of Wyoming and its citizens. It is a dynamic organization pledged to providing educational programs which enable Wyoming citizens to improve their lives and communities through partnerships that put experience and research knowledge to work. The UW Extension delivers university research-based knowledge to Wyoming consumers through the broad program areas of Ag and Hort, 4-H Youth Development, Nutrition and Food Safety, Rangeland, and Community Development Education. Programs include a wide range of topic areas, including food and nutrition, water quality, wildlife, crop production, resource management, and energy related issues.

UW Extension can be accessed on campus through its administrative offices in the College of Agriculture and Natural Resources. In the state, UW Extension offices are found in each county and serve as resources to the county, while also representing a major connection between the university and the people of Wyoming.

Distance Credit Programs

Web site: www.uwyo.edu/distance

The University of Wyoming was the first university west of the Missouri to offer correspondence courses. For over a century UW has embraced the land grant mission by sending its faculty across the state to meet with citizens, students, teachers, business owners, ranchers, and farmers to help them learn. Currently and in partnership with the university’s colleges and departments, UW extends the university learning experience to students across the state, region and nation by offering over 40 academic programs at the certificate, endorsement, bachelor, master, and doctorate award level. Career credentials are also available, mostly concentrated for K-12 educators. The programs feature two different delivery methods both requiring high speed Internet connectivity. Web conferencing courses are “real time” interactive courses that meet regularly throughout the semester. Courses can be delivered to your mobile devices or computers if you have a webcam and a microphone. Fully online courses are available anywhere and at any time. These courses are delivered via WyoCourses and may also use additional online communication and collaborative tools.

University of Wyoming at Casper

Brett Pickett, Ph.D., Dean

125 College Drive, Casper WY 82601

(307) 268-2713

Web site: www.uwyo.edu/distance/centers/uwcasper.html

Since 1976, the University of Wyoming at Casper (UWC), in partnership with Casper College, has offered on-site courses and a slate of university degree programs in Casper. UW-Casper is also the location in Natrona County for statewide degree programs and classes offered through Distance Credit Programs.

UW-Casper was established to meet the needs of students unable to move to Laramie. Some of these students are nontraditional students who may be older or have families, homes, or jobs in the Casper area. UW-Casper is designed to meet the academic needs of students in a setting that provides small class sizes, dedicated staff, and award-winning faculty. Courses are taught by resident and visiting faculty who are regular or part-time members of UW academic departments. A full-service student success office handles admission, registration, financial aid, and advising.

Classes are taught onsite in the Union/University Building at the Casper College campus. More than 3,000 students have received their UW degrees through UW at Casper support and programs.

Undergraduate Majors

Bachelor of Applied Science - Organizational Leadership (Not 100% online)
 Biology
 Business Administration (online)
 Communication
 Criminal Justice (No UW-C faculty)
 Elementary Education
 English (No UW-C faculty)
 Family and Consumer Sciences (online)
 Medical Laboratory Sciences
 Nursing
 Psychology
 Secondary Science Education, Biology
 Social Work
 Technical Education

Graduate Majors

Mental Health or School Counseling

Graduate Majors - available statewide, offered through Distance Credit Programs

Accounting
Curriculum and Instruction (College of Education)
Educational Administration in Adult and Post-Secondary Education
Educational Administration in K-12 Educational Leadership
English
Executive MBA (online)
Family and Consumer Sciences Human Development & Family Sciences
Health Services Administration
Instructional Technology (online) (College of Education)
Kinesiology and Health
Nursing—Nurse Educator (online)
Public Administration (MPA)
Special Education

Doctoral Degrees - available statewide, offered through Distance Credit Programs

Educational Administration in Adult and Post-Secondary Education
Educational Administration in K-12 Educational Leadership
Instructional Technology (online)
Nursing Practice (DNP)

Certificate and Endorsement Programs - available statewide, offered through Distance Credit Programs

Early Childhood Program Director
Early Childhood, Birth to Five
Early Childhood, Birth to Eight
Early Childhood, Special Education
English as a Second Language (ESL)
Literacy
Online Instruction
Play Therapy
Principal in K-12 Educational Leadership
School District Superintendent in K-12 Educational Leadership
School Social Work
Special Education (K-12)
Special Education Director
Teachers of American Indian Children

For more information, contact UW at Casper at 125 College Drive, Casper, WY 82601; (307) 268-2713, (877) 264-9930; or by e-mail at uwcasper@uwyo.edu.

UW Regional Centers

A recruitment and enrollment specialist administers each Regional Center. These individuals are responsible for coordinating adult education and educational activities.

NORTHEAST REGIONAL CENTER—SHERIDAN

Serving Campbell, Crook, Johnson, and Sheridan Counties at Sheridan College
3401 Coffeen Avenue, Sheridan, WY 82801
(307) 672-8737

NORTHEAST REGIONAL CENTER—GILLETTE

Serving Campbell, Crook, Johnson, and Sheridan Counties at Gillette College
300 West Sinclair, Gillette, WY 82718
(307) 686-0044

NORTHWEST REGIONAL CENTER—POWELL

Serving Big Horn, Park, and Washakie Counties at Northwest College
231 West 6th Street, Powell, WY 82435
(307) 754-6108

NORTHWEST REGIONAL CENTER—CODY

Serving Big Horn, Park, and Washakie Counties
1501 Stampede Ave., Unit 9020, Cody, WY 82414
(307) 587-9837

NORTHWEST REGIONAL CENTER—WORLAND

at Worland Community Center - UW Extension Office
P.O. Box 609
1200 Culbertson Ave., Ste. G, Worland, WY 82401
(307) 347-3431

SOUTHEAST REGIONAL CENTER—CHEYENNE

Serving Laramie County
at Enterprise Center, Laramie County Community College
1400 East College Drive, Cheyenne, WY 82007
(307) 632-8949

EASTERN REGIONAL CENTER—TORRINGTON

Serving Converse, Goshen, Niobrara, Platte and Weston Counties at Eastern Wyoming College
3200 West C Street, Torrington, WY 82240
(307) 632-8949
and
at Downtown Lincoln Community Complex
426 East 22nd Ave., Suite E, Torrington, WY 82240
(307) 632-8949

SOUTHWEST REGIONAL CENTER—ROCK SPRINGS

Serving Carbon, Lincoln, Sublette, Sweetwater, and Uinta Counties at Western Wyoming Community College
2500 College Drive, Box G-340, Rock Springs, WY 82901
(307) 382-1817

WEST CENTRAL REGIONAL CENTER—RIVERTON

Serving Fremont, Hot Springs, and Teton Counties at Central Wyoming College
2660 Peck Avenue, Riverton, WY 82501
(307) 856-8651

WEST CENTRAL REGIONAL CENTER—JACKSON

Serving Fremont, Hot Springs, and Teton Counties at Center for the Arts Building
240 S. Glenwood, P.O. Box 4901, Jackson, WY 83001
(307) 734-0224

NATRONA COUNTY—UW at Casper

Serving Natrona County
at Casper College
125 College Drive, Casper, WY 82601
(307) 268-2713

Saturday U**Paul V.M. Flesher, Faculty Director****(307) 766-2616****Web site: www.uwyo.edu/saturdayu**

Saturday University brings UW's faculty to locations throughout the state, to connect with the university's alumni, and others. Each event includes three University of Wyoming professors presenting talks in areas of their expertise, and takes the university's foundational activity - teachers teaching students - and features it publically. Saturday U displays the quality of UW's education and research while at the same time putting a human face on the institution.

Summer Session & J-Term**Miguel Rosales, Project Coordinator, Sr.****(307) 766-6559****Web site: www.uwyo.edu/summer**

Summer Session & J-Term (Winter Session) provide interested and eligible UW students, visiting students and High School guest students the opportunity to earn degree credits and continue to make progress on their academic goals by engaging in flexible and compressed credit bearing course offerings. Summer Session lasts a total of 12-weeks and includes 1, 2, 3, 4, 6, 8 & 12 week courses over the summer. Course formats include face-to-face, online, internship, international travel and other flexible compressed learning opportunities. J-Term (Winter Session) runs between the end of the fall semester and the beginning of the spring semester and includes face-to-face, online, Wyoming based field and International Travel courses.

Wyoming Public Media**Christina Kuzmych, General Manager****Web site: www.wyomingpublicmedia.org**

Wyoming Public Media (WPM) delivers four radio services to residents of Wyoming and beyond, as well as internet streaming, podcasts, and web information services via wyomingpublicmedia.org. Wyoming Public Radio (WPR) is WPM's primary service and is the state's only National Public Radio member. WPR has been serving Wyoming for over 50 years with news, music, and entertainment, now with 33 FM stations and translators statewide. In addition to WPR, WPM operates Classical Wyoming, Jazz Wyoming, Wyoming Sounds, with FM, HD-2, and HD-3 networks expanding across Wyoming. All channels are also available as a stream at wyomingpublicmedia.org.

Wyoming Public Radio (FM and HD Stations)

Afton: KUWA-FM 91.3

Alta/Driggs (Translator): KUWR- FM 91.7

Buffalo: KBUW-FM 90.5 and in HD 90.5-1

HD Classical Wyoming HD-2

HD Wyoming Sounds HD-3

Casper: KUWC-FM 91.3 and in HD-1

HD Classical Wyoming HD-2 and

HD Wyoming Sounds HD-3

Cheyenne: KUWR-FM 91.9 and in HD-1

HD Classical Wyoming HD-2 and

HD Wyoming Sounds HD-3

Cody: KUWP-FM 90.1 and in HD-1

HD Classical Wyoming HD-2 and

HD Wyoming Sounds HD-3

Wyoming Sounds FM 89.1

Douglas: KDUW-FM 91.7 and in HD-1

HD Classical WY HD-2

HD Wyoming Sounds HD-3

Dubois (Translator): KUWR 91.3

Evanston: KUWZ-FM 89.7

Fort Washakie: KUWW-FM 90.9

Gillette: KUWG-FM 90.9 and in HD-1

HD Classical Wyoming HD-2

HD Wyoming Sounds HD-3

Green River: KUWZ-FM 90.5 and in HD-1

Classical Wyoming KZUW-FM 88.5

HD Classical Wyoming HD-2

HD Wyoming Sounds HD-3

Jackson: KUWJ-FM 90.3 and in HD-1

HD Classical Wyoming HD-2

HD Wyoming Sounds HD-3

Classical Wyoming FM 95.7

Wyoming Sounds FM 97.3

Kaycee: KUWK-FM 88.7

Lander: KUWW-FM 90.9 and in HD-1

HD Classical Wyoming HD-2

HD Wyoming Sounds HD-3

Classical Wyoming FM 91.9

Wyoming Sounds FM 102.7

WPR FM 90.5

Laramie: KUWR- 91.9 and in HD-1

Classical Wyoming KUWY-88.5

Jazz Wyoming KUWL-90.1 and

HD Classical Wyoming HD-2

HD Wyoming Sounds HD-3

Lingle: KUWV-FM 90.7

Newcastle: KUWN-FM 90.5

Pinedale: KUWX-FM 90.9

Powell: KUWP-FM 90.1 and in HD-1

HD Classical Wyoming HD-2

HD Wyoming Sounds HD-3

Wyoming Sounds FM 89.1

Rawlins: KUWI-FM 89.9

Riverton: KUWT-FM 91.3 and in HD-1

HD Classical Wyoming HD-2

HD Wyoming Sounds HD-3

Rock Springs: KUWZ-FM 90.5 and in HD-1

Classical Wyoming KZUW-FM 88.5

HD Classical Wyoming HD-2

HD Wyoming Sounds HD-3

Saratoga: KAIW-FM 89.9

Sheridan: KSUW-FM 91.3 and in HD-1

HD Classical Wyoming 91.3.-2

HD Wyoming Sounds HD-3

Sundance: KUWD-FM 91.5 and in HD 91.5-1

HD Classical Wyoming HD-2

HD Wyoming Sounds HD-3

Thermopolis: KUWT-FM 91.3 and in HD-1

HD Classical Wyoming HD-2

HD Wyoming Sounds HD-3

Torrington: KEUW-FM 89.9

Wyoming Sounds FM 89.5

Worland: KUWT-FM 93.3

Wyoming Sounds 94.1

For further information, contact Wyoming Public Media at Dept. 3984, 1000 E. University Ave., Laramie, WY 82071-2000; (307) 766-4240 in Laramie, or (800) 729-5897 within Wyoming.

Special Programs and Facilities for Research and Study

The Libraries

Ivan Gaetz, Dean

William Robertson Coe Library, (307) 766-3279

The University Libraries include the William Robertson Coe Library, the Emmett Chisum Special Collection; the Library Annex, located in the basement of the Biological Science Building, housing government publications and older journals; the Brinkerhoff Earth Resources Information Center, located in the S.H. Knight Geology Building; the Learning Resource Center, located in the Education Building; the Rocky Mountain Herbarium Research Collection, located in the Aven Nelson Building; and the National Park Service Research Center collection in Jackson, Wyoming. UW-Casper is served by the Casper College Goodstein Foundation Library.

The libraries' cataloged collections total over 1.6 million volumes, with over 33,000 volumes added annually. 14,000 active periodical and serial titles are supplemented with access to over 90,000 unique electronic journals and over 800,000 ebooks. In addition, the libraries provide extensive microforms collections and a library of over 175,000 maps, and serve as a depository for United States government publications.

Through participation in the Wyoming Libraries Database (WYLD), Colorado Alliance of Research Libraries ("Alliance"), the Greater Western Library Alliance (GWLA), Hathi Trust, OCLC, the National Network of Libraries of Medicine, on-line information retrieval systems, and the interlibrary loan network, access is provided to other library resources from throughout the nation and the world.

The College of Law maintains a separate Law Library.

Library Faculty:

HILARY BARIBEAU, B.A. Carnegie Mellon 2011; M.L.I.S. Pratt Institute 2018; Assistant Librarian 2019.

STEPHEN C. BOSS, B.M. Simpson College 1983; B.A. 1984; M.L.S. University of Denver 1985; M.A. 1986; Associate Librarian, University Libraries 2008, 2002.

KAIJSA CALKINS, B.A. University of Washington, Bothell 2001; M.L.I.S. University of Washington, Seattle 2004; Associate Librarian, University Libraries 2012, 2006.

KRISTINA A. CLEMENT, B.A. University of Kansas 2007; M.A. University of Notre Dame 2010; M.S.I.S. University of Tennessee 2018; Assistant Librarian 2018.

IVAN GAETZ, B.A. University of Alberta 1975; M. Div. University of Saskatchewan 1978; Th. M. Regis College, University of Toronto 1985; M.L.S. University of Alberta 1988; M. Ed. 1991; Ph.D. University of British Columbia 2004; Dean, University Libraries 2016.

MICHELLE P. GREEN, B.S. Oral Roberts University 2008; M.A. 2011; M.L.I.S. University of Oklahoma 2016; Assistant Librarian 2018.
TAMSEN L. HERT, B.A. Colorado State University 1979; M.L.S. Emporia State University 1984; M.A. 1988; Librarian, University Libraries 2014, 1986.

YOLANDA HOOD, B.A. Elon College 1993; M.A. North Carolina Central 1996; M.L.S. North Carolina Central 2004; Ph.D. University of Missouri 2000; Associate Librarian 2019.

CYNTHIA D. HUGHES, B.A. The College of William and Mary 1994; M.L.I.S. University of Illinois at Urbana-Champaign 1996; Assistant Librarian, University Libraries 2014.

CHAD E. HUTCHENS, B.A. University of Colorado, Boulder 1999; M.A. 2001; M.L.I.S. University of Texas at Austin 2004; Associate Librarian, University Libraries 2014, 2008.

DAVID D. KRUGER, B.S. South Dakota State University 1991; B.S.Ed. Minot State University 1994; M.A. Kansas State University 1996; M.L.S. University of Missouri 1998; Librarian, University Libraries 2016, 1998.

CASSANDRA KVENILD, B.A. University of Wyoming 1996; M.L.I.S. University of Washington, Seattle 2000; Librarian, University Libraries 2018, 2008.

AMANDA LEHMAN, B.A. University of Wyoming 2009; M.L.I.S. Louisiana State University 2013; Assistant Librarian, University Libraries 2016.

DAVID MACAULAY, B.A. University of New Brunswick 1986; M.A. McGill University 1993; M.L.I.S. 2010; Assistant Librarian, University Libraries 2014.

DEBORAH McCARTHY, B.A. Lycoming College 1983; M.L.S. Texas Woman's University 1989; M.B.A. New Mexico State University 2003; Associate Librarian 2009, 2004.

JUDITH E. PASEK, B.S. University of Michigan 1977; M.S. University of Missouri 1980; Ph.D. University of Nebraska 1987; M.L.I.S. Wayne State University 2013; Assistant Librarian, University Libraries 2014.

SAMANTHA PETER, B.A. University of Wyoming 2016; M.S.I.S. University of Texas at Austin 2018; Assistant Librarian 2018.

BRYAN RICUPERO, B.A. Boston University 1996; M.L.I.S. University of Kentucky 2012; Assistant Librarian, University Libraries 2014.

LAWRENCE O. SCHMIDT, B.S. Montana State University 1987; M.S. 1995; M.L.S. Emporia State University 2002; Associate Librarian, University Libraries 2008, 2002.

SHANNON SHERIDAN, B.A. Lycoming College 2015; M.L.I.S. University of Pittsburgh 2017; Assistant Librarian 2019.

SUSAN C. WAYNE, B.A. Clemson University 1995; M.L.I.S. University of South Carolina 2004; Assistant Librarian 2020.

Centennial Complex

Designed by internationally prominent architect Antoine Predock to represent both an “archival mountain” and a town at the foot of the mountain, this dramatic building contains the collections of the American Heritage Center and the UW Art Museum. It is located at 2111 Willett Drive, just north of the Arena Auditorium and War Memorial Stadium.

American Heritage Center

Paul Flesher, Director

(307) 766-4114

Web site: <http://ahc.uwyo.edu>

The American Heritage Center (AHC) is the university’s repository of manuscripts collections, its rare books library, and its official archives. The Center is one of the largest and most consulted non-governmental repositories in the United States. In 2010 it was recognized as one of the most distinguished archives in the nation when it received the Society of American Archivists’ Distinguished Service Award.

The Center places service to UW undergraduates, graduate students, and faculty as its highest priority. However, because the AHC’s collections are known worldwide, UW undergraduates using the Center’s holdings might be working alongside scholars from Japan or Nigeria or the producers of PBS’s *American Experience*.

The AHC’s collections are of interest to far more than history majors. Each year Center archivists work with students in more than two dozen disciplines at UW: Art, African-American Studies, Agricultural Education, American Indian Studies, American Studies, Anthropology, Botany, Business Administration, Civil Engineering, Creative Writing, Energy Law, Geography and Recreation, History, International Studies, Lab School, English, Music, Nursing, Pharmacy, Political Science, Religious Studies, Secondary Education, Sociology, University Studies, Women’s Studies, Zoology. The AHC also works with a dozen public school classes annually.

- Like most major university repositories, the AHC collects both regionally and nationally in select areas. Major subject concentrations of the 75,000 cubic foot manuscript collections include Wyoming and the American West, the mining and petroleum industries, Western politics and leadership, conservation, journalism, transportation, and 20th century entertainment such as popular music, radio, television, and film.

- The Toppan Library is the University’s rare book center. More than 50,000 items range from medieval illuminated manuscripts to the 21st century. Subject strengths include the American West, British and American literature, early exploration of North America, religion, hunting and fishing, natural history, women authors, and the book arts. Unlike most rare book libraries, it is an active teaching site and welcomes both undergraduates and the public.

The AHC website has earned several national awards. Our digital collections contain 100,000+ photos and historical documents: <http://digitalcollections.uwyo.edu>.

The faculty archivists of the AHC are state, regional, national, and international leaders in their fields, speaking and publishing on historical, archival, and library topics. Several teach national workshops. The Center’s reference archivists are leaders in their profession in undergraduate outreach and instruction. Students and faculty are encouraged to visit and make use of the collections – no appointments

are necessary. The American Heritage Center hours are: Reading Room (M, 10am-7pm; Tu-F, 8am-5pm) / Toppan Library (M-F, 8:30am-5pm) / Building (M-F, 8am-5pm).

American Heritage Center Faculty:

SARA C. DAVIS, B.A. University of Wyoming 2005; 2012; M.S.L.S. Simmons College 2016; Associate Archivist 2018.

RACHEL GATTERMEYER, B.A. The Ohio State University 2013; M.L.I.S. University of Illinois Urbana-Champaign 2015; Assistant Archivist 2018.

GINNY KILANDER, B.A. Indiana University 1992; M.A. University of Wyoming 1998; Archivist 2017, 1999.

MOLLY MARCUSSE, B.A. University of Michigan 2010; M.L.S. University of Maryland 2013; Assistant Archivist 2015.

LESLIE C. WAGGENER, B.A. University of Texas, Austin 1995; M.L.I.S. 2000; Archivist 2018, 2000.

D. CLAUDIA THOMPSON, B.A. Metropolitan State College, Denver 1977; M.A. University of Denver 1978; Archivist 2016, 1995.

JOHN WAGGENER, B.A. University of Wyoming 1994; M.A. 2001; Archivist 2018, 2000.

Art Museum

Marianne Eileen Wardle, Director

(307) 766-6622

Web site: <http://www.uwyo.edu/artmuseum>

Located on the east side of campus in the award-winning Centennial Complex, the Art Museum was established to “bring the world of art to Wyoming.” As an academic museum and a leader in the arts, the Art Museum collects, preserves, exhibits and interprets art to inspire creativity and nurture lifelong learning for the people of Wyoming.

The Art Museum’s permanent collection comprises over 8,000 objects, including European and American paintings, prints, sculpture and drawings, special collections of 18th and 19th century Japanese Ukiyo-e prints, 15th through 19th century Persian and Indian miniature paintings, 20th century Haitian art, 20th century Japanese netsuke, 20th century and contemporary photography, and Rapa Nui, Papua New Guinea, African, and Native American artifacts. Exhibitions are curated from the permanent collection, contemporary art by regional, national and international artists, and art from the American West to support the academic mission of the University of Wyoming, provide original resource material for students of all ages, and enhance the cultural life of Wyoming’s citizens and visitors.

The Art Museum provides extensive education programs for all ages, including preschool through 12th grade, university community and life-long learners. Museum experiences can be scheduled for all ages and are based on the model of observe, question, explore, create, and reflect. These experiences are active learning and often involved time in the galleries and studios planned and facilitated by a trained educator or curator. Each visit is tailored to group needs and can be tied to curriculum goals or group outcomes as needed.

The museum’s statewide outreach programs include the Ann Simpson Artmobile and the Regional Touring Exhibition Service, which provide art-filled and creative opportunities to Wyoming people in even the most remote communities and underserved situations. The Artmobile brings original art and programming delivered by a professionally trained museum educator to schools, community centers, libraries, art spaces and adult-living centers. For a small one-way shipping

fee, the Regional Touring Exhibition Service circulates exhibitions of original art from the permanent collection to venues across the state. Curriculum guides and interpretive materials are included.

The Art Museum is free to all and is open Tuesday through Saturday, 10:00 a.m.–5:00 p.m. Hours are extended to include Thursdays until 7 pm during the academic year. Additional information on the Art Museum is available on its webpage, www.uwyo.edu/artmuseum; Facebook (University of Wyoming Art Museum), Instagram (#uwartmuseum) and YouTube (uwartmuseum).

Art Museum Faculty

KATIE CHRISTENSEN, B.F.A. University of Wyoming 2003; M.F.A. Bowling Green State University 2011; Curator of Education and Statewide Engagement/Assistant Lecturer 2015.

RAECHEL COOK, B.A. University of Northern Colorado 2010; M.F.A. Kansas State University 2014; Curator of Academic Engagement/Assistant Lecturer 2018.

NICOLE CRAWFORD, B.A. University of Nebraska 1997; M.A. 2005; Chief Curator/Associate Lecturer 2017, 2009.

SARITA TALUSANI KELLER, B.F.A. University of Houston 1997; M.Ed. 2002; Ph.D. University of North Texas 2014; Artmobile Educator/Assistant Lecturer 2018.

MARIANNE EILEEN WARDLE, B.A. Utah State University 1992; M.A. Brigham Young University 1997; Ph.D. Duke University 2010; Director 2018.

Anthropology Museum

The museum offers exhibits related to the four subfields of anthropology: archaeology, biological, linguistic, and cultural. The main gallery follows the “Human Odyssey,” from the evolution of humans in Africa several million years ago to the spread of our species throughout the world, and on to the Late Pleistocene entry into the Americas. The Colby Mammoth Site, the Vore buffalo jump and other Wyoming archaeology sites are featured, with much of the museum devoted to a celebration of the rich Native American heritage of the Plains and Rocky Mountains. Other displays featuring archaeological research and world cultural diversity can be found in hallway displays throughout the building.

The Anthropology Museum is open 8 a.m. to 5 p.m. Monday through Friday during the academic year. During the summer, hours are from 7:30 a.m. to 4:30 p.m. Monday through Friday.

Division of Information Technology

Robert Aylward, Vice President for Information Technology

IT Center, Room 372, (307) 766-4860

Web site: www.uwyo.edu/InfoTech

The Division of Information Technology provides students, faculty and staff with technology infrastructure and support services—computing systems, networking, technical support for systems and applications, computer support, academic and classroom technology support, training, telecommunications services, and research computing support including high performance computing. Use of these University computing and data facilities is governed by UW Regulation 3-690, Ethical Use of Computers and Data Communications Facilities.

The office of the Vice President of the Division of Information Technology is located in room 372 of the Information Technology Center and is open during normal business hours. Those in need of assistance are encouraged to call the Client Support Help Desk at 766-4357, option 1.

IT Service Center: provides technology support during normal business hours. The fastest way to contact the UWIT Service Center is to browse our Service Catalog and Knowledge Base at uwit.uwyo.edu. Our Knowledge Base contains self-help documents and videos, as well as information on IT services we provide to our campus community. Other options to contact the help desk are to email userhelp@uwyo.edu or call 307-766-HELP (4357), option 1. You can also chat with the Service Center at support.uwyo.edu. IT Service Center hours are posted at www.uwyo.edu/InfoTech/services/helpdesk/.

IT Walk-In Service Center and Resnet: provides help to students, faculty, and staff with personal computers and mobile devices. The Walk-In Service Center is located in the ITC building room 160 and is typically open Monday – Friday, 9am – 4pm with reduced hours during breaks and the summer months. The Walk-In Service Center is closed during all University holidays.

One of the primary goals of the Service Center while helping with personal computing devices is to teach customers. Therefore, Information Technology does not allow devices to be dropped off to be repaired. IT requests its customers to take an active role and remain with their device while any repair work is underway. The IT Walk-In Service Center also provides one-on-one consulting if help is needed in purchasing a new personal computer or mobile device. More information on the Walk-In Service Center can be found at www.uwyo.edu/resnet.

Telecom Services: provides a range of telecommunications services including phone and data connections, long distance and voice mail. Contact Information Technology’s Telecom Help Desk by calling 766-HELP (4357), option 2, or email teledesk@uwyo.edu to request these services.

Internet and Network Access: an extensive campus-wide data network provides connectivity to the Internet in all occupied campus buildings, computer labs across campus, and university housing. Wireless Ethernet (Wi-Fi) is available in most campus locations. Students, faculty, and staff should connect to the UWyo wireless network, since it is a faster, more secure connection than UWguest. More information can be found at www.uwyo.edu/askit or call the IT Help Desk at 766-HELP (4357), option 1.

Computer Labs: are located throughout campus for students, faculty, and staff use. The computers labs contain computers with a wide variety of software and computing equipment. Some labs are staffed by student lab assistants who are able to answer questions. Computer labs in Coe Library and the Information Technology Center are open and staffed 24 hours during the normal academic year. The UWStudent Remote Lab System is a collection of lab machines that are designed to be accessed from off campus networks. The remote lab is configured similar to the UWStudent labs found on campus.

More information, including a link to the UW Student Remote Lab System, a complete listing of labs, lab schedules, and software policies, is available online at microlab.uwyo.edu. For questions and assistance, please e-mail userhelp@uwyo.edu or call the Help Desk at 766-HELP (4357), option 1.

Classroom Technology Support (CTS): provides support and maintenance for audio visual and other technology used in classrooms and technology spaces across campus. For immediate assistance when teaching in a general pool classroom, pick up the phone; the phone will automatically connect to the UW IT Help Desk at the top of the queue. If the issue cannot be resolved over the phone, someone will

arrive promptly to provide assistance. If you are in a room other than a general pool classroom, call the help desk at 766-4357 or press the help icon on the lectern touch panel. Please let them know if you require immediate help or if you do not want your class interrupted. Workshops for classroom technologies are available by request. Call 766-2872 for more information. Please go to www.uwyo.edu/centralscheduling/classroom-building/training.html for further details. Lecture capture technology (Wyocast) is available in several classrooms on campus. For more information on this popular technology please visit <http://www.uwyo.edu/infotech/services/multimedia/wyocast/>.

Data Center Operations (DC Ops): manages and operates the 6,000 ft² University Data Center, located in the Information Technology Center. The Data Center provides a state of the art, highly redundant infrastructure space for university IT equipment. University departments may apply for co-location space in the Data Center to house production computing equipment. For more information on co-location, contact Data Center Operations at operate-it@uwyo.edu.

Computer Maintenance: provides repair and general hardware support for PCs, laser printers, and other equipment as well as manufacturer warranty repair support for most Apple, HP, Dell, and Lenovo products. Computer repair requests may be submitted by filling out the web form at uwyo.teamdynamix.com/TDClient/Requests/ServiceCatalog?CategoryID=3285 or by contacting the Help Desk at 766-HELP (4357), option 1.

Software Sales: provides Adobe, Microsoft and statistical software to eligible faculty, staff, and students. For more information on available software and licensing information, please visit uwyo.teamdynamix.com/TDClient/Requests/ServiceCatalog?CategoryID=3091.

Geological Museum

Hours: Mon.-Sat. (10:00am-4:00pm), closed holidays
(307) 766-2646

E-mail: geolmus@uwyo.edu

Web site: www.uwyo.edu/geomuseum

The Geological Museum, in the east wing of the S.H. Knight Geology Building, exhibits the story of ancient Wyoming. Highlight exhibits include: a fully mounted skeleton of the well-known dinosaur *Apatosaurus* (*Brontosaurus*); a mounted skeletal cast of the world-renowned "Big Al" the *Allosaurus*; a 50-million-year-old garfish from Wyoming's Green River Formation (one of the largest complete freshwater fossil fish on display in the world); casts of skulls of Wyoming's state dinosaur, *Triceratops*; and its contemporary, *Tyrannosaurus rex*; mounted skeletons of Miocene rhinos and camels; an interactive augmented reality sandbox, our fossil prep-lab, and a fluorescent mineral room, featuring specimens from Wyoming and the world. The museum maintains important display collections (particularly vertebrate and invertebrate fossils) that are available for study by students, as well as scientists from other institutions. The museum provides unique opportunities for undergraduate and graduate students to pursue research and display projects in Wyoming paleontology, and for students minoring in museum studies to gain valuable experience with natural history museums and collections.

William D. Ruckelshaus Institute of Environment and Natural Resources

Nicole Korfanta, Director

Bim Kendall House

804 E. Fremont St.

Laramie, Wyoming 82072

Phone: (307) 766-5080, Fax: (307) 766-5099

Email: ruckelshaus@uwyo.edu

Web site: www.uwyo.edu/haub/ruckelshaus-institute

The William D. Ruckelshaus Institute supports stakeholder-driven solutions to environmental challenges by communicating relevant research and promoting collaborative decision making. The Ruckelshaus Institute is housed within the Haub School of Environment and Natural Resources at the University of Wyoming, whose mission is to advance understanding and resolution of complex environmental and natural resource challenges.

Collaborative Solutions: The Ruckelshaus Institute supports sound, inclusive approaches to environmental conflict resolution by facilitating and convening collaborative processes, offering trainings in collaborative decision making for natural resource professionals, and teaching courses in negotiation theory and practice for UW students. The Collaboration Program in Natural Resources is a yearlong professional development series to train natural resource professionals in negotiation, facilitation, and collaborative processes.

Natural Resource Initiatives: Since 1994, the Ruckelshaus Institute has been producing scientific, technical, and socioeconomic synthesis and analysis on natural resource issues important to Wyoming and the West. Areas of emphasis include maintaining open spaces, mitigating energy development impacts for wildlife, and public and private lands management. The institute also addresses questions related to wildlife, water, and environmental policy.

Science Communication and Outreach: The Ruckelshaus Institute makes research available to stakeholders through accessible publications and by convening conferences on critical natural resource issues. The institute's biannual magazine, *Western Confluence*, communicates university research on natural resource questions to a range of environmental and natural resource stakeholders. The institute also offers services in communication, video production, and publishing to help agencies and organizations engage the public on complex natural resource issues.

Wyoming Geographic Information Science Center

Jeff Hamerlinck, Director

Agriculture C, Room 337 (307) 766-2532

E-mail: wygisc@uwyo.edu

Web site: www.uwyo.edu/wygisc

The Wyoming Geographic Information Science Center (WyGISC) has a mission to advance the understanding and application of geographic information science through basic and applied research, education and training, information and technology transfer, and by promoting utilization of geospatial technologies for science, management, and decision making within the University and throughout the state and region. Examples of geospatial technologies include geographic information systems, geographic cartography and visualization, Global Positioning System-based mapping, and image processing of remotely-sensed Earth resource data derived from aircraft or satellites. Broad applications areas exist in both environmental and social sciences, as well as agriculture, engineering and business.

Established in 2001, WyGISC operates under the Office of Academic Affairs and in close coordination with the Office of Research and Economic Development, providing assistance to all units on campus and to numerous private, local, state, and federal entities in Wyoming and the Rocky Mountain region. Services include research collaboration, technical expertise, geospatial technology short course training, and geospatial data dissemination.

GIST Curriculum: Beginning in fall 2019, WyGISC began offering undergraduate and graduate coursework in geospatial information science and technology under the GIST prefix. These courses provide fundamental education in geographic information systems and remote sensing to students from across disciplines at UW and contribute to a new multidisciplinary program in GIST that is being developed by the Center.

WyGISC encourages undergraduate and graduate student participation in its research projects and has sponsored students from the McNair Scholars Program and other student research apprentice programs, as well as graduate students affiliated with participating departments and research centers. Part-time employment and internship opportunities are often available. Inquiries may be directed to the center using the contact information provided above.

Statistical Consulting Center

Ken Gerow, Director

337 Ross Hall, (307) 766-6600

The Statistical Consulting Center, a unit of the Department of Statistics, exists to coordinate the statistical knowledge and skills available within the department with the subject-matter expertise of other scientists throughout the university, and to bring that combination to bear on applied research problems in diverse areas. The center can provide assistance in research design, sampling, data collection, and/or data analysis for the full range of research needs. The initial consultation is free. Thereafter, a variety of mechanisms are available to acknowledge the contributions of statistical consulting to a given research project, including co-authorship on a scholarly publication, membership on a thesis or dissertation committee, direct compensation to the consultant at private consulting rates, subcontracting with the center on a grant project, etc. On occasion, the center can also offer paid employment and internships to graduate students who have appropriate training and skills to assist other researchers. For further information about any of the services available through the Statistical Consulting Center, please contact the center via the contact information above.

Wyoming Survey & Analysis Center

Tiffany Comer Cook, Interim Executive Director

UW Office Annex, Second Floor

Dept. 3925; 1000 E. University Ave.

Laramie, Wyoming 82071

Phone: (307) 766-2189, Fax: (307)766-2759

Email: wysac@uwyo.edu

Web site: www.uwyo.edu/wysac

The Wyoming Survey & Analysis Center at the University of Wyoming seeks to provide clear, accurate, and useful information to decision-makers through applied social science research, scientific polling, information technology services, and rigorous program evaluation. Without bias and with the highest standards of validity, WYSAC collects, manages, analyzes, and reports data for public and private sectors in Wyoming and throughout the nation.

WYSAC has four research areas. By Executive Order, WYSAC serves as Wyoming's statistical analysis center for criminal justice research. The Center for Criminal Justice Research (CJR) at WYSAC collects and analyzes criminal justice data to enable effective planning, practice, and policy development for the State of Wyoming. The CJR is also active nationally as a member of the Justice Research and Statistics Association.

The Center for Information Technology Services specializes in web-based applications, database management, and website development. We create case management programs, desktop applications for data management, prevention and evaluation data entry systems, and interactive online data visualizations.

The Center for Research and Evaluation conducts studies to inform programming, funding, and policy decisions, especially in the areas of public health, substance abuse prevention, and education. We collect qualitative and quantitative data, compile administrative records, conduct statistical analyses, interpret findings, write reports and fact sheets, conduct needs assessments, create evaluation plans and logic models, and write grant applications.

The Survey Research Center (SRC) specializes in survey design, administration, sampling, and data analysis. The SRC conducts phone, mail, internet, and mixed-mode surveys using current technologies and WYSAC's in-house call center. The SRC has expertise in weighting survey data, conducting statistical analysis of the collected data, and creating technical reports and PowerPoint presentations of the results.

WYSAC offers paid employment for students who are looking for experience in social science research. Contact us for additional information, or search for current job openings on UW's website.

UW National Park Service Research Center

(307) 766-4227

Web site: www.uwyo.edu/uwnps

The research center operates in a field station at the historic AMK Ranch in Grand Teton National Park, located 65 km north of Jackson, Wyoming. The field station provides scientists abundant research opportunities in the diverse terrestrial and aquatic environments of Grand Teton and Yellowstone National Parks as well as the surrounding National Forests and Wilderness areas that make up the entire Greater Yellowstone area (GYA). The station has housing for up to 60 researchers and provides terrestrial and aquatic laboratories, boats, field equipment, conference rooms, internet service and a library, all on site. A small grants program provides funding yearly for individual proposals up to \$5,000 as well as scholarship and intern funding for projects conducted in the GYA. Field courses and conference are accommodated in the spring and fall seasons. A weekly seminar series with a barbecue dinner is presented throughout the summer.

Inquiries concerning the UW-NPS Research Center program should be addressed to: Director, University of Wyoming-National Park Service Research Center, Dept. 3166, 1000 E. University Ave., Laramie, WY 82071 or emailed to uwnps@uwyo.edu.

Red Buttes Environmental Biology Laboratory

Within a few miles of Laramie, the Department of Zoology and Physiology operates the Red Buttes Environmental Biology Laboratory, a 9,600-square-foot facility equipped to handle both aquatic and terrestrial vertebrates. An aquatic ecology and toxicology laboratory, uniquely designed to accommodate a wide range of test conditions of water flow, temperature and composition, is available within the facility. Animal holding and surgical rooms are specifically constructed to accommodate experimentation on small (e.g. mice, squirrels), medium (e.g. coyote, badger) and large (e.g. elk, bighorn sheep) mammals. Outdoor corrals and fish runs are also available on the 400-acre site.

Inquiries concerning the Red Buttes Environmental Biology Laboratory should be addressed to the Department Head, Department of Zoology and Physiology, Dept. 3166, 1000 E. University Ave., Laramie, WY 82071, or (307) 766-4207.

Rocky Mountain Herbarium

Located in the Aven Nelson Building, the Rocky Mountain Herbarium and the associated U.S. Forest Service National Herbarium contain more than 1,250,000 plant specimens. The primary functions of the herbarium are to (1) serve as a source of information on the flora of the Rocky Mountain region in general and Wyoming in particular; (2) aid in the identification of plants submitted by ranchers, farmers, county agents, and state and federal agencies throughout the region; and (3) serve as a source of research and teaching material in systematic and ecological botany. Thousands of specimens are loaned each year to recognized institutions throughout the United States where research requires a knowledge of western plants. The web site (www.rmh.uwyo.edu) contains data on more than 700,000 specimens as well as thousands of specimen images and interactive distribution maps.

Open to university students and other qualified researchers, the herbarium invites queries regarding the identification of plants. Those persons wishing assistance in the identification of a plant should send two specimens to the herbarium. Inquiries should be addressed to The Curator, Rocky Mountain Herbarium, Department of Botany, Dept. 3165, 1000 E. University Ave., Laramie, WY 82071.

Vertebrate Museum

(307) 766-6227 & (307) 766-6169

Email: ewommack@uwyo.edu & mcaring@uwyo.eduWeb site: www.uwymv.org

The mission of the Museum of Vertebrates is to document and understand regional and global biodiversity through acquisition and investigation of collections to advance academic knowledge and public appreciation of the natural world. While its holdings primarily contain vertebrates found in the Rocky Mountain Region, the museum, they do include specimens from all across the world. Although the Museum of Vertebrates has no formal exhibits and is not regularly open to the public, its collections are widely used by researchers, educators, and for outreach activities.

To learn more about the Museum of Vertebrates, including how to access our collections or schedule a tour, please visit www.uwymv.org.

Collections Location: The UWYMV collections can be found on the ground floor of the Berry Biodiversity Conservation Center, rooms 133 and 119.

Wilhelm G. Solheim Mycological Herbarium

The Wilhelm G. Solheim Mycological Herbarium, housed on the third floor of the Aven Nelson Building, facilitates the study of symbiotic and biotrophic fungi. The herbarium contains approximately 50,000 specimens of fungi from around the world and the largest collection of fungi in the Rocky Mountain Region. These collections are available for study by qualified students and researchers. Specimens may be borrowed by institutions without charge for a one-year period. Inquiries should be addressed to The Curator, Solheim Mycological Herbarium, Department of Botany, Dept. 3165, 1000 E. University Ave., Laramie, WY 82071.

Louis O. and Terua P. Williams Conservatory

Hours: Monday-Friday 10:00am-4:00pm, closed holidays

(307) 766-4336

Web site: www.uwyo.edu/conservatoryEmail: conservatory@uwyo.edu

The Williams Conservatory is a year-round multipurpose facility that has promoted botanical research, education, and outreach since 1994. Located in the Aven Nelson building at the University of Wyoming, our greenhouse is home to over 600 tropical, neotropical, temperate, and arid species from around the world. Conservatory facilities are used by researchers, educators, students in both K-12 and post-secondary levels, artists, horticulture enthusiasts, and the general public. Walk-ins are welcome, or contact us in advance to schedule a guided tour.

**Wyoming Cooperative Fish & Wildlife Research Unit
(307) 766-5415**

Web site: www.coopunits.org/Wyoming

Email: wyo-coop@uwyo.edu

The Wyoming Cooperative Fish and Wildlife Research Unit is supported by the University of Wyoming, the Wyoming Game and Fish Department, the U.S. Geological Survey and the Wildlife Management Institute. The three permanent unit leaders serve as full faculty in the Department of Zoology and Physiology.

The Unit conducts research on many types of fish and wildlife issues. A primary emphasis is on evaluating the ecology and management of fish and wildlife in the northern Rocky Mountain region. Much of the Wyoming Game and Fish Department's field research is conducted through the Unit. Both students hired as technicians as well as graduate assistants are involved in Unit research. Additional details of the Unit's research program can be found at www.wyocoopunit.org.

For further information contact the Wyoming Cooperative Research Unit, Dept. 3166, 1000 E. University Ave., Laramie, WY 82071, or wyo-coop@uwyo.edu.

Wyoming State Veterinary Laboratory

1174 Snowy Range Road, (307) 766-9925

E-mail: vetrec@uwyo.edu

Web site: wyovet.uwyo.edu

Located west of campus and operated by the Department of Veterinary Sciences, the Wyoming State Veterinary Laboratory (WSVL) is responsible for diagnosis and reporting of animal diseases. Areas of expertise include morphological and clinical pathology, bacteriology, virology, toxicology, parasitology, electron microscopy, molecular diagnostics, and serology.

Cooperative diagnostic and research activities are conducted with various state and federal agencies. The WSVL building also houses a UW classroom, laboratories for the Wyoming Game and Fish Department, and Wyoming Department of Agriculture Analytical Services Laboratory. Students are encouraged to conduct domestic and wildlife disease research in an interdisciplinary setting.

For further information contact WSVL, 1174 Snowy Range Road, Laramie, WY 82070.

**Western Interstate Commission for Higher Education
(WICHE)**

The Western Interstate Commission for Higher Education (WICHE) was created in 1953 by the governors and legislators of the western states. The primary commitment is to provide access to educational programs through interstate cooperation. Wyoming provides opportunities for qualified residents in the following programs:

Professional Student Exchange Program (PSEP) offers certified Wyoming residents access to professional education in the fields of dentistry, medicine, occupational therapy, optometry, osteopathic medicine, physical therapy, physician assistant, podiatry, and veterinary medicine. To be eligible for certification, the applicant or a spouse must be a legal resident of the State of Wyoming for one year immediately prior to enrolling in professional school. Applications for certification are available by June 1 at www.uwyo.edu/certwy and are due no later than October 15 of the year preceding the anticipated start date of professional school. Applicants who are accepted to a professional program and who receive state support pay reduced tuition. In all fields except veterinary medicine, students receiving state support must either pay back the money expended on their behalf, or practice in their fields in the state of Wyoming for three years. State support is dependent on continued appropriations from the Wyoming State Legislature. The University of Wyoming School of Pharmacy welcomes applicants from residents of Alaska, Nevada and the CMNI through the PSEP program. Students accepted through PSEP may be eligible for tuition support from their home state or territory.

Western Regional Graduate Program (WRGP) provides opportunities for qualified Wyoming residents to attend distinctive or health-related graduate programs in participating WICHE states and territories. Those accepted pay resident or significantly reduced tuition at the school they attend. Graduate students from WICHE states or territories interested in the Haub School of Environment and Natural Resources, Doctorate of Nurse Practice and Graduate Social Work may be eligible for reduced tuition via the WRGP program.

Western Undergraduate Exchange (WUE) allows residents of participating states and territories to attend a participating institution at reduced cost of 150% of the institution's resident tuition. Not all programs in the participating states offer WUE opportunities.

The University of Wyoming invites competitive graduating high school senior from all WUE states and territories to apply for the WUE tuition discount. All undergraduate UW majors are eligible for WUE support. Information is available from the UW Admissions Office.

Information about WICHE PSEP or WRGP programs may be obtained from the WICHE Certifying Office; Dept. 3432, 1000 E. University Ave, Laramie, WY 82071; (307)766-3499 or certoff@uwyo.edu or from WICHE, 3035 Center Green Drive, Suite 200; Boulder, CO 80301-2204, (303) 541-0214.

Commonly Used Terms

A-F: Letter grades of A, A-, B+, B, B-, C+, C, C-, D+, D, or F.

Academic load: The total semester hours of credit for all courses taken during a specified time—semester or summer session.

Academic probation: Probation is the status of an undergraduate student who is not progressing satisfactorily toward his or her degree. An undergraduate student shall be placed on probation at the end of the semester or term when his or her cumulative grade point average (GPA) falls below a 2.000 (3.000 for graduate students).

Academic reinstatement: Restoration of a student's eligibility to register for courses after being on academic suspension. This process requires a petition that is first reviewed by the dean of the student's college or the Center for Advising and Career Services. Academic reinstatement does not guarantee restoration of financial aid eligibility which is a separate process handled by the financial aid office.

Academic suspension: The status of a person whose enrollment at UW has been terminated because of unsatisfactory academic progress towards either an undergraduate or graduate degree.

Accredited: A term applied to a school or specific program which has been recognized by a national or regional organization as meeting certain academic standards for quality and educational environment. The University of Wyoming, and all UW academic programs, are accredited by the Higher Learning Commission of the North Central Association of Colleges and Schools Commission on Institutions of Higher Education. This is the highest level of accreditation in the United States. Some academic programs have professional standards established by their respective accrediting associations.

Add and drop deadlines: The latest date in an academic term when a course may be added or dropped from a student's class schedule *without* approval of someone other than the student. Adding and dropping of courses is done through WyoRecords.

Admission: The process of being admitted to the university with the opportunity to take classes.

AP exam: An Advanced Placement Examination from the College Entrance Examination Board (CEEB) in a specific subject area available nationally to high school students. Information on taking the examination may be obtained from a high school guidance counselor. Information on university course credit for these examinations is available from the Office of the Registrar.

Audit: Individuals who want to take a course but who do not want either a grade or credit for taking it may register as an audit. The instructor for the course determines the amount of work and/or participation that is required. Marks of either Audit/Satisfactory or Audit/Unsatisfactory are assigned. Audit hours are charged tuition at the normal rate. Audit hours are not used to determine full- or part-time status.

Banner: Banner is a suite of products that are used as the university's student information system.

Class schedule: A publication containing a listing of all courses scheduled to be offered during a specific semester or summer session. *Class Schedules* are available on the Office of the Registrar's website.

CLEP test: Subject area examination administered by the College Entrance Examination Board (CEEB).

Concentration: A collection of courses within a major which focuses on a particular subject area.

Concurrent major: A double major. Only one degree will be awarded based on the student's primary major.

Continuing probation: An undergraduate student on academic probation is considered on continuing probation in subsequent semesters if the student earns a term GPA of 2.000 or above but whose cumulative GPA is still below a 2.000.

Corequisite: A course to be taken or a requirement to be fulfilled at the same time as a particular course is being taken. Departments reserve the right to drop a student from a class if the student does not have the corequisite.

Cross-listed course: A course which is identical in content, title, credit hours, and requirements which is offered by one or more academic departments. The four-digit course number must be the same. This designation must be approved by the University Course Review Committee.

Curriculum: The set of courses in a particular degree program. More generally, the courses (in total) offered in a college or university.

Degree requirements: Degree requirements include all requirements of the university (including University Studies Program), college, academic department, and major. All requirements must be successfully met in order to obtain a specific degree.

Drop: To discontinue enrollment in a course or courses prior to the end of the drop/add period at the beginning of a term. A dropped course does not appear on the student's academic transcript. Dropping from a class does not influence a student's Satisfactory Academic Progress measurement, but may impact the amount of financial aid a student earns for the semester in question.

Dual degree: Two degrees are awarded, and students must complete all of the degree requirements for the colleges of both majors. Dual degree require additional credits above the minimum required for one degree.

Dual-listed course: A course which is offered at both the 4000- and 5000-level that is identical in course prefix, content, title, and credit hours. The last three digits of the four-digit course number must be the same. The 5000-level course must require additional work beyond that required for the 4000-level course. This designation must be approved by the University Course Review Committee.

Financial aid reinstatement: Restoration of one's financial aid eligibility based on being granted an exception to financial aid or scholarship rules. Financial aid restoration is a separate process from and is not guaranteed by academic reinstatement.

Full-time: A student taking 12 or more credit hours at the undergraduate level or 9 or more credit hours at the graduate level is considered a full-time student. During the summer session, students enrolled in 6 or more credit hours are considered full-time.

Grade point average: The semester grade point average (GPA) is the sum of all grade points earned in a semester or term divided by all credit hours attempted for letter grade. Credit hours in courses in which marks of I, W, S, or U were assigned are excluded. The cumulative grade point average is the sum of all grade points earned at UW divided by the sum of all credit hours attempted at UW for a letter grade, for all non-excluded courses.

Lower-division course: Courses normally taken during the freshman and sophomore years. Lower division courses are those numbered between 1000 and 2999, inclusive.

Major: The primary disciplinary interest or academic subject area of a student as represented by one of the curricula offered by the various academic departments. The undergraduate degree may or may not carry the same title as the major. Every student has one or more majors but may or may not have a minor or concentration.

Minor: A secondary subject area interest (to the major) represented by a specified set of hours and/or courses. Differs from a concentration in that a minor is not a subdivision of the major subject area.

Option: A collection of elective courses within a major which emphasize one aspect of the major, chosen by a student according to his or her interests.

Orientation: A program of one to three days on campus designed to acquaint a new student with the facilities, policies, sources of information and assistance, and academic and social environment. Academic advising and registration are also included.

Prerequisite: A requirement to be completed before enrollment in a course or a degree program. Prerequisites for individual courses are listed in their course description in this catalog. The statement “or consent of instructor” is implied for all prerequisites. Students are responsible for being aware of a course’s prerequisites prior to enrolling in the course. Departments reserve the right to drop a student from a class if the student does not have the prerequisite.

Registration: The process of officially enrolling into one or more courses at the university.

Satisfactory academic progress: Satisfactory Academic Progress only applies to federal financial aid applicants and recipients. Three measures of a student’s advancement toward the earning of his or her stated degree objective are: 1) a grade point average putting the student in good academic standing, 2) a ratio of credit hours earned compared to credit hours attempted in the student’s most recent academic year, and 3) a comparison of the number of credit hours attempted in a college career compared to the number of hours required to earn the pursued degree.

Semester: The division of the calendar year used in academic scheduling. A semester is roughly 15 weeks in length.

Semester credit hour: The unit of academic credit for course work.

Transfer credit evaluations: An evaluation of previous college-level course work from another regionally-accredited academic institution, international post-secondary institution, standardized test, or military course work to determine whether courses are transferable to UW as well as to determine any UW equivalents.

University Catalog: The *University Catalog* is the official document of the university which includes information on all undergraduate academic programs and their requirements, courses offered by each academic department, lists of faculty, policies and procedures related to admission, financial aid, all registration activity, and tuition and fees. A student’s degree requirements are based on the *University Catalog* in effect the year he or she enters either UW or another catalog year as approved with a petition.

Upper-division course: Courses normally taken during the junior and senior years. These courses are numbered from 3000 – 4999, inclusive.

“W” Number: A student’s unique identifier in WyoRecords will begin with “W”. This “W” number replaces the Social Security Number as a student’s unique identifier.

Withdrawal: To discontinue enrollment in a course or courses after the end of the drop/add period. When withdrawing from one or more, but not all, courses, a student should complete the process on WyoRecords. To withdraw from all courses in a semester, a student should begin the process in the Dean of Students Office. A mark of W will be placed on the student’s academic transcript for each course. Withdrawal from a course or from the university may impact both a student’s current and future receipt of financial aid. Ask a financial aid office professional before withdrawing.

WyoRecords: The University of Wyoming portal used for communication with the campus community, registration activity, grade posting, financial aid, course management, and advising. A specialized version of WyoRecords is available for all enrolled students, faculty, staff, and alumni.

Courses of Instruction

Changes in Catalog Information

The course offerings and requirements of the University of Wyoming are under examination and revision continually. This catalog is not a contract; it merely presents the offerings and requirements in effect at the time of publication and in no way guarantees that the offerings and requirements will not change.

Not all courses are offered each term. The listing of courses does not imply a contractual obligation to offer the same during the year of publication of this catalog. The university reserves the right to offer, limit, or cancel course offerings for academic, funding, or facility considerations, and to cancel any offered course for which there is not sufficient enrollment.

The university reserves the right to change approved course listings at any time during a student's term of residence.

Preparatory Courses Taught at UW by Laramie County Community College

The University of Wyoming has contracted for Laramie County Community College to offer preparatory courses on the university campus. University students will register through the normal university registration process. Inclusion of these courses in a student's schedule will count as part of the credit load for determining full-time status; however, UW credit is not awarded. For further information, contact the LCCC coordinator, at (307) 766-2514 or go to Ross Hall, rooms 26 and 27.

Course Credits

The amount of credit offered for any course work published in this catalog is based on and governed by prior university faculty recommendation and institutional determinations.

A credit hour denotes a unit of academic work. Normally, one credit hour is earned in a course meeting one hour per week for a semester (15-16 weeks). Each credit hour unit requires an average of three hours of student-effort per week. In variable-credit courses, the efforts required of the students are proportional to the credit hours attempted.

Even if topics differ in separate sections, variable-credit courses have limits on the number of credits which can be earned in that course in a semester and/or a student's career.

Format of Course Listings

On the following pages, courses approved for offering are listed by college, program subject, and course level (number).

The heading which precedes the brief description of each course shows the current course identification number; former course number(s), if any, in brackets; course title; a designation in bold brackets ([QB◆Q], e.g. [USP 2003 designation◆USP 2015 designation]), if any, concerning applicability of the course to the University Studies Program (see below for designation); the number of semester credit hours established for the course (fixed or variable with the semester); and the career maximum of credit for successive term enrollments in the identified course, if different from the established semester credit-

hours limit. For example, "1-3 (Max.9)" means that a student may earn between 1 and 3 hours of credit for that course within one semester and a maximum of 9 hours within a degree career. The course description indicates any prerequisites for that course and if it is offered for satisfactory/unsatisfactory grading only.

Course Levels

University courses are distinguished by number indicating five levels of instruction as follows:

0000-0999	Preparatory courses (no credit)
1000-2999	Primarily for Freshmen and Sophomores
3000-4999	Primarily for Juniors and Seniors
5000-5999	Primarily for Graduate Students
6000-6999	Law courses, WWAMI courses, and Doctor of Pharmacy courses

A bracketed course number [] indicates a previous number of the same course. Double credit cannot be earned by repeating a course.

Prerequisites are the primary factor which normally govern whether a student may enroll for any particular course. However, individual departments and/or colleges may place additional restrictions on course enrollments (e.g. enrollment may be restricted by student classification).

Enrollment in engineering courses is generally limited to engineering students.

Law courses are normally open only to students approved for the program.

Graduate students may enroll in courses numbered 1000-3999 to satisfy undergraduate deficiencies but only courses numbered 4000 and above will be computed into the graduate GPA and allowed for graduate credit.

University Studies Program Designations*

C1	=	Communication 1
C2	=	Communication 2
C3	=	Communication 3
FY	=	First-Year Seminar
H	=	Human Culture
PN	=	Physical and Natural World
Q	=	Quantitative Reasoning
V	=	U.S. and Wyoming Constitutions

*Please note: Throughout the department pages and course descriptions in this catalog, a few of the USP 2015 designations will appear as such: C1 = COM1; C2 = COM2; C3 = COM3; FY = FYS.

Course Prefixes and Description Index

Prefix	Department	Page	Prefix	Department	Page
AAST	African American and Diaspora Studies	148	ENR	Environment and Natural Resources	560
ACCT	Accounting	341	ENTO	Entomology	108
ACES	Advising Career Exploratory Studies	583	ENTR	Entrepreneurship	356
ADED	Adult Education	398	ENVE	Environmental Engineering	453
AECL	Agroecology	137	ERS	Energy Resources	578
AGEC	Agricultural Economics	90	ES	Engineering Science	413
AGRI	Agriculture	89	ESCI	Science Education	387
AIR	Air Force ROTC	551	ESE	Energy Systems Engineering	459
AMST	American Studies	229	ESL	English as a Second Language	585
ANSC	Animal Science	96	ESM	Ecosystem Science and Management	103
ANTH	Anthropology	161	ESS	Environmental System Sciences	565
ARBC	Arabic	306	FCSC	Family and Consumer Science	115
ARE	Architectural Engineering	423	FDSC	Food Science	102
ARMY	Army ROTC	549	FIN	Finance	341
ART	Art	169	FREN	French	247
AS	Arts and Sciences	156	GEOG	Geography	212
ASTR	Astronomy	290	GEOL	Geology and Geophysics	218
ATSC	Atmospheric Science	414	GERM	German	248
BE	Bioengineering	452	GIST	Geospatial Information Science Technology	567
BMS	Biomedical Science	524	GRK	Greek	249
BOT	Botany	180	HIST	History	229
BUSN	Business	341	HIED	Higher Education	398
CE	Civil Engineering	423	HLED	Health Education	487
CHE	Chemical Engineering	417	HLSC	Health Sciences	470
CHEM	Chemistry	185	HM	Human Medicine	490
CHIN	Chinese	246	HOSP	Hospitality	340
CLAS	Classics	246	HP	Honors College	580
COJO	Communication and Journalism	190	IMGT	Information Management	345
CM	Construction Management	434	INBU	International Business	357
CNSL	Counseling	394	INST	International Studies	296
COSC	Computer Science	437	ITEC	Learning, Design, and Technology	405
CRMJ	Criminal Justice	197	JAPN	Japanese	249
CW	Creative Writing	178	KIN	Kinesiology	482
DHYG	Dental Hygiene	471	LANG	Languages	250
DSCI	Decision Sciences	356	LATN	Latin	250
ECOL	Ecology	524	LAW	Law	541
ECON	Economics	349	LBRY	Information Literacy	571
EDAD	Educational Leadership	403	LEAD	Leadership	340
EDAG	Agricultural Education	392	LIBS	Library Sciences	408
EDCI	Curriculum and Instruction	383	LIFE	Life Sciences	253
EDEC	Early Childhood Education	389	LS	Land Surveying	436
EDEL	Elementary Education	388	LTED	Literacy Education	386
EDEX	Special Education	409	LTST	Latina/o Studies	159
EDRE	Educational Research	404	MATH	Mathematics	254
EDSE	Secondary Education	390	MBAM	Master of Business Administration	362
EDST	Educational Studies	387	MBAX	Online Master of Business Administration	366
EE	Electrical Engineering	445	ME	Mechanical Engineering	453
EMAT	Mathematics Education	386	MGT	Management	355
ENGL	English	204	MICR	Microbiology	128

Prefix	Department	Page	Prefix	Department	Page
MKT	Marketing	355	PRST	Professional Studies	411
MLSK	Medical Laboratory Science	512	PSYC	Psychology	315
MOLB	Molecular Biology	130	RELI	Religious Studies	282
MUSC	Music	267	REWM	Rangeland Ecology and Watershed Management	109
NAIS	Native American and Indigenous Studies	151	RNEW	Renewable Resources	107
NASC	Natural Science	528	SELL	Professional Sales	361
NEUR	Neuroscience	530	SOC	Sociology	201
NURS	Nursing	497	SOIL	Soil Science	113
ORTM	Outdoor Recreation and Tourism Management	565	SOWK	Social Work	516
PATB	Pathobiology	148	SPAN	Spanish	251
PEAC	Physical Education Activity	482	SPPA	Speech-Language Pathology	475
PEAT	Varsity Athletics	482	STAT	Statistics	254
PETE	Petroleum Engineering	461	STEP	STEP	584
PHCY	Pharmacy	502	THEA	Theatre and Dance	321
PHIL	Philosophy	282	UWYO	University of Wyoming	582
PHYS	Physics	290	WIND	Wyoming Institute for Disabilities	521
PLNT	Plant Sciences	135	WMST	Gender and Women's Studies	154
POLS	Political Science	306	ZOO	Zoology and Physiology	329

College of Agriculture and Natural Resources

151 Agriculture Building

Barbara Rasco, Dean

Phone: (307)766-4135 Fax: (307)766-4030

Web site: www.uwyo.edu/uwag

The College of Agriculture and Natural Resources offers a wide variety of course work in agriculture, natural resources, molecular biology, and family and consumer sciences. The curriculum provides a sound background in basic sciences and the choice of a number of fields in which to specialize. Students are trained in principles which apply throughout the world, with special emphasis on agriculture and natural resources found in the Rocky Mountain region.

Laboratory work is stressed in all programs because of its importance in agricultural and natural resource professions. Students receive excellent training from case studies and practical experience provided at research and extension centers. Other facilities include modern laboratories and classrooms, an abattoir, meat processing rooms, farm shop, greenhouses, and wool laboratory.

In addition to the academic departments, the college includes the Agricultural Experiment Station and the Extension Service. Materials and techniques resulting from this effective triple combination benefit both students and staff in the never-ending search for problem-solving information. The close relationship between teachers, researchers, and extension workers creates a learning atmosphere that encourages the development of the finest students.

Programs of Study Undergraduate Degrees

Bachelor of Science

- Agricultural business
- Agricultural communications
- Agroecology
- Animal and veterinary sciences
- Microbiology
- Molecular biology
- Rangeland ecology and watershed management

Bachelor of Science in Family and Consumer Sciences

Bachelor of Applied Science

- Organizational leadership

Graduate Degrees

Master of Arts

- Molecular biology

Master of Science

- Agricultural and applied economics
- Agricultural economics/water resources
- Animal and veterinary sciences
- Entomology
- Entomology/water resources
- Family and consumer sciences
- Food science and human nutrition
- Molecular biology
- Plant sciences
- Rangeland ecology and watershed management
- Rangeland ecology and watershed management/water resources
- Reproductive biology
- Soil science
- Soil science/water resources

Doctor of Philosophy

- Animal and veterinary science
- Entomology
- Molecular and cellular life sciences
- Molecular biology
- Plant sciences
- Rangeland ecology and watershed management
- Reproductive biology
- Soil science

The following certificates and/or degrees in the College of Agriculture and Natural Resources are available through Distance Education:

- Certificate: Early Childhood Program Director
- Bachelor of Applied Science
- Online bachelor's degrees: Family and Consumer Sciences (Professional Child Development Option)

For more information, contact the College of Agriculture and Natural Resources Office of Academic and Student Programs.

The College of Agriculture and Natural Resources also offers a graduate certificate in reclamation and restoration ecology. For more information, contact the Department of Ecosystem Science and Management.

Basic Education Core

All undergraduates in College of Agriculture and Natural Resources curriculums are required to follow the basic education core as noted below.

Core Components (USP 2015)	Hrs.
First-Year Seminar (FYS).....	3
Quantitative Reasoning (Q).....	3
Communication 1 (COM1).....	3
Communication 2 (COM2).....	3
Communication 3 (COM3).....	3
Human Culture (H).....	6
Physical & Natural World (PN).....	6
U.S. and Wyoming Constitutions (V).....	3
Subtotal (min. core requirements).....	30
Hours for major, support areas and electives as determined by division... 90-98	
Total Hours	120-128

Core Components (USP 2003)	Hrs.
Intellectual Community (I).....	1-3
Writing 1 (WA).....	3
Oral Communication (O).....	3
Quantitative Reasoning 1 (QA)*.....	3
Quantitative Reasoning 2 (QB).....	3
Science (S, SB, SP, SE).....	4-8
Cultural Context (C, CH, CS, CA).....	9
U.S. and Wyoming Constitutions (V).....	3
Physical Activity and Health (P).....	1
Subtotal (min. core requirements).....	30-36
Hours for major, support areas and electives as determined by division.... 79-91	
Total Hours	120-128

*Core Components are mutually exclusive of each other; hence, two core components may not be fulfilled by the same course. Except for the QA, core courses may have topics from the embeddable components list included in their curriculum, where appropriate.

Courses taken for S/U

A maximum of 20 elective hours with a grade of S (satisfactory) may be included as part of the total credit requirements for graduation; but no S/U hours may be used to satisfy university, major requirements or required electives, unless the course is offered for S/U grading only.

Minors in Agriculture and Natural Resources

Minors provide a formalized recognition of concentrated study in a specific subject area. A minor degree offers recognition for academic achievement outside of the students' major course curriculum and gives students a concentration of work in the chosen minor area.

A minors program can enable students to enhance and expand career opportunities. A minor will also improve the possibility of admission to graduate programs in any chosen major, minor, or related field of study.

Minors Available in the College of Agriculture and Natural Resources Include:

- Agricultural business
- Agroecology
- Animal and veterinary science
- Apparel design
- Equine
- Farm and ranch management
- Forest resources
- General agricultural economics
- Horticulture
- Human development and family sciences
- Human nutrition
- Insect biology
- Interior design
- International agricultural economics
- Molecular biology
- Museum studies
- Natural resource economics
- Plant protection
- Rangeland ecology and watershed management
- Reclamation and restoration ecology
- Soil science

Agricultural Communications Major

A wide variety of courses in agriculture, communications, and journalism provides students with basic preparation for positions as broadcasters, editors or writers for farm and home organizations, state and federal agencies, magazines, newspapers, radio and television stations, and commercial businesses. Communication skills are also distinct assets in agricultural sales, research, service and teaching.

Students enrolled in agricultural courses acquire up-to-date and knowledgeable backgrounds of the subject matter. Courses in communication and journalism develop proficiencies demanded by employers of communication professionals.

Minimum Requirements for Agricultural Communications Majors (B.S.)

	Hrs.
University Studies Program requirements.....	30
Communications/journalism core.....	24
COJO 1000, 1040, 2010, 2100 and minimum of 12 hours of communication/journalism elective. (Minimum grade of C required)	
Agriculture core requirements	42
At least 18 hours must be lower division (Ag 1000-2000) elective courses, and at least 24 hours must be upper division (Ag 3000-4000) elective courses and include AGRI 4975.	
Supporting course requirement	4
STAT 2050 or 2070	
Additional hours for major and electives	20
Total Hrs:	120

Students wishing to pursue an area of emphasis in the agricultural communications option are encouraged to also select a minor. The college currently offers a variety of minors, and any of these can help to better prepare students for employment or graduate work.

Agricultural communication majors may also complete an internship in their field. A variety of opportunities are available and students can work with their advisor to determine an appropriate internship for their area of emphasis.

Agriculture (AGRI)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1520. Field Practices: Extension. 1-2 (Max. 2). Project based work that includes practice applications of Extension programming. Directed by Extension faculty around matching topics of youth development, rangeland resources, food safety and nutrition, community development, or profitable and sustainable agriculture. Local issues are addressed in the context of applied research for public good.

2100. International Experiences in Natural Resources. 1-3 (Max. 3). Cultural and environmental topics in another country through classroom sessions, self study, and a visit to the host country. Topics discussed include similarities and differences in natural resource and environmental issues, history, traditions, and cultural norms, focusing on the host country and the United States.

3000. Discovering and Utilizing Ideas and Information. 3. [I,L◀(none)] Learning in this area guides students to accessing, evaluating, and utilizing information and ideas; communicating information and ideas effectively and responsibly; civic engagement for individual, organizational and community problem-solving, and applying new skills, knowledge, and perspectives in a contemporary society. *Prerequisites:* WA and junior status.

4350. Problem Solving in Organizational Settings. 3. Students apply organizational leadership perspectives and methods to the resolution of a variety of simulations and real world problems. The course will emphasize leadership development as a tool for individual, organizational and community problem solving. *Prerequisites:* junior or senior standing and COM2.

4500. International Experiences in Agriculture. 1 (Max. 3). Learn about agricultural customs in another country through classroom lectures, written assignments, and a visit to the host country during the spring break period. Topics discussed include the influence of foreign agriculture on U.S. economies and agricultural practices, focusing on the host country. *Prerequisites:* completion of WA course and junior standing.

4520. Field Practicum: Extension Work. 1-4 (Max. 8). Provides practical experiences to those wanting to pursue a career with Cooperative Extension Service. Interns are matched with county-based personnel for hands-on learning experiences across the state. Develop working knowledge of CES's mission to provide the citizens of Wyoming with education and applied research. Dual listed with AGRI 5520. *Prerequisite:* must pass volunteer screening process.

4600. Developing Organizational Leadership. 3. [(none)◀▶COM3] A senior capstone experience for Bachelor of Applied Science students, bringing together reading, research, writing, and communication skills to focus on a major project. Leadership skills and approaches to organizational problem-solving are deepened using the structural, human resource, political, and symbolic frames to change and improve leadership and organizational culture. *Prerequisites:* COM1, COM2, AGRI 3000, and senior status.

4700. Elements of Leadership. 3. Focuses on a basic understanding of theory and practice. Will develop self-awareness and provide a foundation for continued development of leadership skill in the workplace, the community and the home. Dual listed with AGRI 5700. *Prerequisite:* Restricted enrollment. Prior approval required.

4960. Bachelor of Applied Science Internship. 6. Provides Bachelor of Applied Science students academic credit for advanced work experiences in their area of specialization. Required to complete academic assignments such as a weekly journal, discussion and writing assignments in addition to their field-based responsibilities. Takes place in a mentored, supervised setting. *Prerequisites:* Bachelor of Applied Science student, AGRI 3000, senior status, and consent of instructor.

4970. Internship/Practicum. 1-8 (Max. 8). Internship or practicum experience in Agricultural Communications. *Prerequisite:* COM2 or WB.

4975. Agricultural Communications Senior Project. 1. A baccalaureate degree capstone experience incorporating self assessments of student learning, reflective writings, and an analysis, synthesis and evaluation of the agricultural communications curriculum. Students develop and present a personalized, comprehensive, professional portfolio. *Prerequisite:* agricultural communication major with senior standing and WB.

4990. Topics. 1-6 (Max. 8). Accommodates topics whose subject matter is not included in other College of Agriculture and Natural Resources and Natural Resources offerings. Please see the class schedule for current topic. *Prerequisite:* WB.

5520. Field Practicum: Extension Work. 1-4 (Max 9). Organization, teaching, and promotion of county programs.

5700. Elements of Leadership. 3. Focuses on a basic understanding of theory and practice. Will develop self-awareness and provide a foundation for continued development of leadership skill in the workplace, the community and the home. Dual listed with AGRI 4700. *Prerequisite:* Restricted enrollment. Prior approval required.

5920. Continuing Registration: On Campus. 1-2 (Max 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1 - 3. (Max 99). Designed to provide an enrichment experience in a variety of topics. Note: Credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1 - 12. (Max 16). Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

Department of Agricultural and Applied Economics

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Professors:

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CHRISTOPHER T. BASTIAN, B.S. University of Wyoming 1987; M.S. 1990; Ph.D. Colorado State University 2004; Professor of Agricultural Economics 2017, 2005.

ROGER COUPAL, B.S. Utah State University 1978; M.S. University of Arizona 1985; Ph.D. Washington State University 1997; Professor of Agricultural Economics 2015, 1997.

DON MCLEOD, B.S. St. John's College 1982; M.S. Oregon State University 1987; Ph.D. 1994; Professor of Agricultural Economics 2015, 1995.

L. STEVEN SMUTKO, B.S. Colorado State University 1978; M.C.R.P. North Dakota State University 1982; Ph.D. Auburn 1995; Spicer Chair of Collaborative Practice, Professor of Agricultural Economics 2009.

Associate Professors:

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KRISTIANA M. HANSEN, B.A. Reed College 1996; M.S. University of California, Davis 2003; Ph.D. 2008; Associate Professor of Agricultural Economics 2016, 2009.

CHIAN A. JONES-RITTEN, B.S. Northern Arizona University 2003; M.A. Colorado State University 2007; Ph.D. 2011; Associate Professor of Agricultural Economics 2013.

BENJAMIN S. RASHFORD, B.S. University of Wyoming 1999; M.S. 2001; Ph.D. Oregon State University 2006; Associate Professor of Agricultural Economics 2012, 2006.

JOHN RITTEN, B.S. Arizona State University 2001; M.B.A. New Mexico State University 2004; Ph.D. Colorado State University 2008; Associate Professor of Agricultural Economics 2015, 2008.

Assistant Professor:

VARDGES HOVHANNISYAN, B.S. Armenian State University of Economics 1999; M.S. Armenian State Agrarian University

2002; Ph.D. University of Wisconsin-Madison 2012; Assistant Professor of Agricultural Economics 2015.

Academic Professionals:

JEFFERSON G. EDGENS, B.A. Presbyterian College 1989; M.P.A. Coastal Management University of West Florida 1992; Ph.D. Michigan State University 1998; Senior Lecturer 2017.

COLE EHMKE, B.A. Bethany College 1997; M.S. University of Sydney, Australia 1999; Associate University Extension Educator 2011, 2005.

BRIDGER M. FEUZ, B.S. University of Wyoming 1994; M.S. 1996; Senior Extension Educator 2012, 2004.

THOMAS FOULKE, B.A. University of Montana 1985; M.S. University of Wyoming 1992; Senior Research Scientist 2010, 1998.

SELENA GERACE, B.A. Whitman College 2007; M.S. University of Wyoming 2017; Assistant Extension Educator 2017.

LETICIA HENDERSON, B.S. New Mexico State University 2010; M.S. 2012; Assistant Lecturer 2019.

JOHN HEWLETT, B.S. Montana State University 1985; M.S. Oregon State University 1987; Senior Extension Educator 1987.

BRIAN LEE, B.S. University of Wyoming 2010; M.S. 2012; Research Scientist 2012.

AMY NAGLER, B.A. University of Wyoming 1996; M.S. 2002; Assistant Research Scientist 2016.

DUANE D. WILLIAMS, B.S. Oklahoma State University 1981; M.S. 1983; Ph.D. Kansas State University 1995; Senior Academic Professional 2014.

Temporary Lecturer:

JIM THOMPSON, B.A. Occidental College; M.A., Ph.D. University of Illinois-Chicago.

Professors Emeritus:

Nicole Ballenger, Edward Bradley, Larry J. Held, James J. Jacobs, Dale Menkhous, Carl Olson, Alan C. Schroeder, David T. Taylor, Glen D. Whipple

The Department of Agricultural and Applied Economics offers three options within the agricultural business bachelor of science degree program. They are agribusiness management, farm and ranch management, and livestock business management. All three options focus on the development of critical thinking, research, and communication skills for students interested in

1. agricultural operations,
2. small rural businesses,

- 3. community economics,
- 4. financial institutions,
- 5. agricultural and natural resources development, and
- 6. other pursuits where applied economic tools will be useful.

The agricultural business curriculum is designed to enable our students to:

- 1. communicate effectively economic, agricultural, business decision-making and natural resource concepts,
- 2. fit into a business, agency, or academic environment and use economic concepts to quantify and analyze relevant issues, and
- 3. be familiar with issues related to agriculture, natural resources, and rural communities.

A brief description of minimum course requirements for each of the four options in agricultural business is given below. In addition, professional advisers will work with students to tailor a curriculum to individual interests and goals.

Agribusiness Management Option

This curriculum is for students preparing for careers in the agribusiness field. Applied agricultural economics courses are supplemented with marketing, management, finance and other courses from the College of Business and production-oriented courses from other departments in the College of Agriculture and Natural Resources.

Minimum Course Requirements for Agricultural Business (B.S.) Majors within the Agribusiness Management Option¹

	Hrs.
First-Year Seminar (FYS).....	3
Writing	9
ENGL 1010 ² (COM1), Communication II (COM2), AGECE 4965 or AGECE 4970 (COM3)	
Quantitative (Q) (required for major).....	7
MATH 1400; 2350	
Science ³ (PN)	6
Human Culture (H) ⁴	6
U.S. & Wyoming Constitutions (V).....	3
Agricultural Economics ⁵	24
1010, 1020, 3400, 4050 or MKT 3210 (count for either upper-division AGECE or business credit, but not both), 4060, 4500; either 4450 or 4830 or 4840 or 4880; 3 hours of AGECE electives	
Supporting Agriculture	9
AG College hours other than Agricultural Economics	
Statistics	4
Computers ⁶	3

Supporting Economics.....	6
ECON 3010 and 3020	
Business	15
ACCT 2010 and 2020; and 9 hours of 3000-4000 level business courses	
Electives	25
Total Hours	120

¹A minimum of 42 credits must be at the 3000 and 4000 level for graduation. At least 30 of the 42 credits must be earned from UW.

²Recommend or equivalent COM1 course.

³Credits earned in USP approved science courses offered within the College of Agriculture and Natural Resources shall also serve as Supporting Agriculture credits.

⁴H requirement cannot be fulfilled with AGECE or ECON courses; USP-approved H language courses are recommended.

⁵24 credit hours in Ag Econ beyond those earned to satisfy University Studies requirements. 18 of these 24 credit hours must be at the 3000-4000 level.

⁶COSC 1200 recommended, or IMGT 2400.

Farm and Ranch Management Option

This curriculum is for students intending to become operators or professional managers of farms, ranches or feedlots. It is also well suited for students interested in the field of agricultural finance, or a minor in biological fields such as agroecology or range management.

In this option, courses in farm and ranch management, finance, and marketing are supplemented by courses in crops, range management, veterinary sciences and animal science, with electives in other areas.

Minimum Course Requirements for Agricultural Business (B.S.) Majors within the Farm and Ranch Management Option¹

	Hrs.
First-Year Seminar (FYS).....	3
Writing	9
ENGL 1010 ² (COM1), Communication II (COM2), AGECE 4965 or AGECE 4970 (COM3)	
Quantitative (Q) (required for major).....	7
MATH 1400; 2350	
Science ³ (PN)	6
CHEM 1000 or 1020 or 1050.....	4
SOIL 2010	4
One additional PN course	3
Human Culture (H) ⁴	6
U.S. & Wyoming Constitutions (V).....	3
Agricultural Economics ⁵	28
1010, 1020, 2020, 3400, 4640, 12 hours AGECE electives	
Supporting Agriculture	12
SOIL 2010 and 8 AG College hours other than Agricultural Economics	

Statistics	4
Computers ⁶	3
Supporting Economics.....	6
ECON 3010 and 3020	
Business	3
ACCT 2010	
Electives	29
Total Hrs.	120

¹A minimum of 42 credits must be at the 3000 and 4000 level for graduation. At least 30 of the 42 credits must be earned from UW.

²Recommend or equivalent COM1 course.

³Credits earned in USP approved science courses offered within the College of Agriculture and Natural Resources shall also serve as Supporting Agriculture credits.

⁴H requirement cannot be fulfilled with AGECE or ECON courses; USP-approved H language courses are recommended.

⁵24 credits in Ag Econ beyond those earned to satisfy University Studies requirements. 18 of these 24 credit hours must be at the 3000-4000 level.

⁶COSC 1200 recommended, or IMGT 2400.

Livestock Business Management Option

This curriculum is for students intending to work in any sector of the livestock and meat industry, ranging from input suppliers, to ranches, feedlots, meat packing companies, marketing and sales agents, futures/commodities exchange groups, policy makers, and international trade organizations. In this option, courses in farm and ranch management, agricultural finance, marketing, and trade are supplemented with courses in animal science, biology, range management, food science, data analysis, and other disciplines. Students may pursue a minor in Animal Science as part of this option, but can choose the non-minor version instead. Students will gain a broad understanding of both the business and science of the livestock industry.

Minimum Course Requirements for Agricultural Business (B.S.) Majors within the Livestock Business Management Option¹

	Hrs.
First-Year Seminar (FYS) ²	3
Writing - Communication ²	9
COM1 ² , COM2 ² , COM3 - AGECE 4965 or AGECE 4970 ²	
Quantitative (Q)	7
MATH 1400 ² ; 2350	
Science (PN) ³	8
CHEM 1000; LIFE 1010	
Human Culture (H) ³	6
U.S. & Wyoming Constitutions (V).....	3
Agricultural Economics ⁴	31
AGECE 1010, 1020, 2020, 4640, 3400 or 4710, 4060, 4050 or MKT 3210, AGECE 4830 or 4840 ⁵ , 4880 or 4280 or ECON 4720, AGECE 4500	

Additional Quantitative Skills.....	10
STAT 2050 or 2070; COSC 1200 or	
IMGT 1400 or AGRI 1010 ⁶ ; AGECEC	
4230 or 4840 or STAT 3050 or IMGT	
1400 or 3400 or MATH 2355 or ACCT	
2010 or 2020	
Biology of Livestock.....	17
LIFE 2020, 3050, FDSC 2040, 3060,	
ANSC 4540	
Additional Biology of Livestock (for Animal	
Science minor ⁷)	19
ANSC 2010, 3010, 3100, 4120, PATB	
4110, ANSC 3150 or 4220 or 4230 or	
4240	
Or	
Additional Biology of Livestock (for non-	
minor)	20
ANSC 1010, 2020, 4050, REWM 2000,	
4100, REWM 4000 or PATB 4110	
Supporting Economics.....	3
ECON 3020	
Electives	3-4
Total Hrs.	120

¹A minimum of 42 credits must be at the 3000 and 4000 level for graduation. At least 30 of the 42 credits must be earned from UW.

²Must earn a “C” or better.

³PN and H may not be fulfilled by AGECEC or ECON courses.

⁴31 credits in Ag Econ beyond those earned to satisfy University Studies requirements; 21 of these 31 credit hours must be earned at the 3000-4000 level.

⁵AGECEC 4840 may not be double-counted towards both Agricultural Economics and Quantitative Skills.

⁶Suggest COSC 1200 for most, or IMGT 2400 (for advanced users).

⁷Must earn a “C” or better in all courses required in the minor to earn the minor.

Environment and Natural Resources

Students interested in natural resource or environmental issues or careers may complete any of the four options within agricultural business offered by the department with an environment and natural resource emphasis. Inquiries about environment and natural resource concentrations in agricultural business should be directed to the Department of Agricultural and Applied Economics.

Minor Programs

The department also offers five minor programs. These five minors are to give students majoring in other undergraduate curricula in the university a concentration of work in any of the specialized undergraduate curricula offered by the department or in general agricultural economics. Each minor requires 27 hours

in prescribed course work including 6 hours in supporting agriculture. Students need to plan their course work to meet course prerequisites.

Agricultural Business Minor. AGECEC 1010, 1020, 4050 or MKT 3210, and 4060; ACCT 2010; 6 additional hours in upper-level agricultural economics courses; 6 hours in supporting agriculture courses.

Farm and Ranch Management Minor. AGECEC 1010, 1020, 2020 and 4640; 9 additional hours in upper-level agricultural economics courses; 6 hours in supporting agriculture courses.

International Agriculture Minor. AGECEC 1010, 1020, 3860 and 4880; 6 additional hours in upper-level agricultural economics courses; 3 hours in foreign culture or language; 6 hours in supporting agriculture courses.

Natural Resource Economics Minor. AGECEC 1020, 3750, 4700, 4720; choose 9 additional hours from: AGECEC 4450, 4600, 4710, ECON 2400, 4400, 4410, 4520 (note: College of Business prerequisites), ENR 4500.

General Agricultural Economics Minor. AGECEC 1010, 1020 and 15 additional hours in agricultural economics courses with 12 hours at the upper-level; 6 hours in supporting agriculture courses.

Graduate Study

The Department of Agricultural and Applied Economics offers graduate work leading to the Master of Science degree. Students may choose among major options in the areas of agricultural and applied economics and agricultural business. The Plan A agricultural economics major emphasizes research with any of the following focus areas:

- production economics and management, marketing and market analysis, resource and environmental economics, international agriculture, and economic and rural development.

The Plan B agricultural business option offers advanced skills to students who desire professional careers in the business sector. Students in the agricultural business option may concentrate their coursework and writing in management, marketing, or finance. Dual majors in water resources, and environment and natural resources are also offered.

Finally, the Department offers a graduate minor in applied economics. This program is for currently enrolled graduate students in other disciplines seeking a foundation in economics as well as their major discipline.

Program Specific Admission Requirements

Undergraduate major in agricultural economics or economics is not required.

Students may be required to complete program prerequisite courses, without graduate credit, that were not completed in their undergraduate education.

Specifically, students who have not completed at least one course in calculus, statistics, and intermediate microeconomic theory may be required to complete these courses without graduate credit during their first semester in residence.

Program Specific Degree Requirements

Master of Science in Agricultural Economics

The following courses constitute the M.S. in Agricultural Economics core requirements and are required of all Plan A candidates (22 hours).

Economic Theory

AGECEC 5310 Theory of Producer Behavior...	3
AGECEC 5630 Advanced Natural Resource Economics	3
AGECEC 5710 Advanced Agricultural Market Theory	3
AGECEC 5740 Theory of Consumer Behavior	3

Quantitative Methods

AGECEC 5230 Intermediate Econometric Theory	3
AGECEC 5320 Quantitative Methods in Agricultural Economics	3

Research

AGECEC 5650 Communicating Research.....	3
AGECEC 5880 Advanced Seminar.....	1

Plan A (thesis):

Minimum of 30 credit hours including AGECEC M.S. core requirements, thesis hours and electives.

No more than three hours of AGECEC coursework numbered below 5000-level count toward the 30 hour requirement.

Achieve a cumulative 3.000 GPA in the AGECEC M.S. core requirements.

The student’s graduate committee, nominated by the major professor, the student, and the department head determine the final program of study and thesis research topic.

Presentation of research results at a formal public seminar.

Completion of an oral examination covering the student’s thesis research administered by the student’s graduate committee.

Plan B (non-thesis):

Minimum of 32 hours of coursework;

Non-thesis business analysis paper accepted by the student's graduate committee.

Minimum of 13 credit hours of agricultural economics coursework numbered at the 5000-level are required, including:

AGEC 5310

AGEC 5740

AGEC 5880

AGEC 5630 or 5710

AGEC 5320 or 5230

In addition, students are required to complete 3 credit hours from each of the following three areas:

Management:

AGEC 4060, 4640 or 5460; or MGT

4410, 4420, 4440, 4470, or 4520

Marketing:

AGEC 4050, 4830, 4840, 4880, or 5710;

or MKT 4240, 4430, 4520, or 4540

Finance:

AGEC 4500; or FIN 4510, 4520,

4610, 4810; or ECON 4740

Remaining credit hours will be filled with electives.

The student's graduate committee, nominated by the major professor, the student and the department head determine the final program of study and business analysis topic.

Presentation of the business analysis paper at a formal public seminar.

An internship experience is strongly encouraged as part of the agricultural business option (AGEC 5990).

**Master of Science in Agricultural Economics/
Water Resources; Plan A (thesis):**

Students must complete the 20 credit hour agricultural and applied economics M.S. core requirements plus 4 thesis hours and 10 credit hours in water resources approved courses.

Please refer to Water Resources Degree program in this *Catalog* for updated degree requirements.

Achieve a cumulative 3.000 GPA in the AGEC M.S. core requirements.

The student's graduate committee, nominated by the major professor, the student and the department head determine the final program of study and business analysis topic, which must be in the water resources area.

Presentation of research results at a formal public seminar.

Completion of an oral examination covering the student's thesis research administered by the student's graduate committee.

**Master of Science in Agricultural Economics/
Environment and Natural Resources (ENR); Plan
A (thesis):**

Students must complete the 20 credit hour agricultural and applied economics M.S. core requirements plus 4 thesis hours and 15 credit hours in environment and natural resources, as approved by the student's committee and the ENR academic adviser.

Achieve a cumulative 3.000 GPA in the AGEC M.S. core requirements.

The student's graduate committee, nominated by the major professor, the student and the department head determine the final program of study and business analysis topic, which must be in the area of environment and natural resources.

Presentation of research results at a formal public seminar.

Completion of an oral examination covering the student's thesis research administered by the student's graduate committee.

Graduate Minor in Applied Economics:

Graduate standing.

AGEC 4640, AGEC 5310 or 5740, AGEC 5320 or 5230, and 6 additional credits of approved courses.

Committee selection for the student's major thesis or dissertation committee should include at least one faculty member from AGEC.

**Agricultural Economics
(AGEC)**

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦♦Q]).

1010. Principles of Macroeconomics. 3. [CS♦♦H] An introductory course on why economics matters. We examine why countries like the US are rich, while others are poor. We explore economic booms & busts, and policies to avoid them. We address GDP growth, unemployment and inflation, government debt, deficits, tax policy, and whether robots will take our jobs. Cross listed with ECON 1010.

1020. Principles of Microeconomics. 3. [CS♦♦H] You make tradeoffs — your time and money are limited. Microeconomics evaluates how people think about tradeoffs and how we create value through markets, institutions, and policy. Economic incentives influence choices to consume and produce goods and

services. Market failure creates a role for government to protect health, culture, and nature. Cross listed with ECON 1020.

1101. First-Year Seminar. 3. [(none)♦♦FYS] 2020. Farm and Ranch Business Management. 4. Discusses economic principles, business methods and science applied to organization and operation. Includes measurements of size of business; rate and efficiency of production. (Normally offered spring semester)

3030 [3020]. Applied Economic Decisions. 3.

The purpose of the class is twofold: 1) To practice applying concepts, tools, and models from principles of economics to real-world problems affecting agriculture and agribusiness; and, 2) To understand the role of individual behavior in economic outcomes that particularly affect agriculture. Restricted to AGEC majors. *Prerequisites:* AGEC/ECON 1010, AGEC/ECON 1020, and MATH 1400.

3400 [4400]. Agricultural Law. 3.

[WB♦♦(none)] Surveys legal issues and principles of practical concern to agriculture and examines legal institutions authorized to carry out laws affecting agriculture. *Prerequisite:* WA/COM1 and junior standing. (Normally offered fall semester)

3420. Applied Equity Investing. 3. Introduces the fundamentals of understanding how the stock market works, what types of investment products are available, how to purchase them and what to look out for in making investment decisions. Students will make investment decisions on a simulated portfolio and write justifications for their purchases. *Prerequisite:* COM2 and MATH 1400. (Normally offered spring semester)

3750 [4750]. Natural Resource Planning

and Economics. 3. Economic concepts and rudimentary analytical tools are applied to federal, state and local natural resource planning and management programs. The value of economic input into natural resource policy is examined. Evaluating tradeoffs and resolving conflicts play a particularly important role in the course content. Cross listed with ENR 3750. *Prerequisites:* QA/Q, WA/COM1 and junior standing.

3860 [4860]. World Food, Ag, & Development. 3. [G♦♦H]

Explores economic approaches to improving nutrition, agriculture production, and the environment in developing regions of the world. Students gain understanding of complex conditions surrounding food security; institutions involved with food policy, aid, and production; environmental factors influencing agricultural production; inequality; and international cultural and so-

cietal food disparities. Cross listed with INST 3860. *Prerequisite:* AGEC/ECON 1010 or 1020. (Normally offered spring semester)

4050. Agribusiness Marketing. 3. Students develop a strategic marketing plan for an agricultural and food product. Content includes study of aspects of the global food industry influencing consumer demand; contemporary topics in food marketing and policy; agricultural supply marketing; marketing research methods; marketing profitability measures; pricing; new product introduction; branding, and industry competitive analysis. *Prerequisites:* AGEC 1020 or ECON 1020 and MATH 1400. (Normally offered fall semester)

4060. Agribusiness Management. 3. Applies quantitative, economic, financial and managerial analysis to agribusiness sector. *Prerequisites:* AGEC 1020 and MATH 1400. (Normally offered spring semester)

4200. Gender and Race in the Economy. 3. [D◀(none)] Focuses on the role gender and race play in the economy; specifically the way that gender and race affect economic outcomes for individuals in the United States. Cross listed with WMST 4200. Dual listed with AGEC 5200. *Prerequisites:* AGEC 1020 or equivalent, or SOC 1000, or WMST 1080, and WB/COM2.

4230. Intermediate Econometric Theory. 3. Covers simple and multiple regression models, problems of estimation, hypothesis and diagnostic testing, dummy variable, autoregressive and distributed lag models, and time-series analysis. The objective is to understand the underlying theory of econometric modeling and obtain operational ability to construct, estimate, and test econometric models. Cross listed with ECON 4230; dual listed with AGEC 5230. *Prerequisites:* ECON 3020, STAT 2050 or STAT 2070, and MATH 2350. (Normally offered spring semester)

4280. International Food and Farm Cultures. 3. [G▶(none)] Study-tour course in western France of lectures, fieldtrips, and other cultural activities are integrated into a curriculum to study sustainable food cultures and farming systems. Students live with host families and learn about current policies, belief systems and cultural practices that guide food production, consumption and marketing in Europe. *Prerequisite:* completion of WA/COM1 and I/FYS.

4450. Negotiation. 3. Examines how to use negotiation to resolve conflict and get agreement. Describes conflict; outlines ways to address conflict; examines different negotiation strategies and the impact of cognitive bias, power, ethics, and individual and cultural differences; and explores mediation practices.

Students complete negotiations, role-plays, and questionnaires. Cross listed with ENR 4450. Dual listed with AGEC 5450. *Prerequisite:* completion of USP O/COM2 requirement; junior standing.

4460 [5460]. Agriculture and Economic Development. 3. Examines the roles of agriculture in the transformation of the economics of underdeveloped countries. Examines development theories, case studies and analytical techniques. *Prerequisites:* AGEC 1010, 1020 and a G course.

4500 [650]. Agricultural Finance. 3. Principles of financial management; compounding and discounting; leverage and capital budgeting and alternatives in resource control. *Prerequisite:* AGEC 1020 or equivalent. (Normally offered spring semester)

4550. Negotiation Analysis. 3. Focuses on using an analytical perspective for maximizing joint gains between negotiators. Students learn analytical techniques to prepare for negotiation, evaluate options and proposals during a negotiation, and evaluate negotiated outcomes with respect to maximization of joint gains and fairness criteria. Dual listed with AGEC 5550; Cross listed with ENR 4550. *Prerequisite:* QA/Q.

4600. Community Economic Analysis. 3. [(none)▶H] Analysis of regions and rural communities; their problems, socioeconomic characteristics, land use and economic development. Provides training in regional economic analysis, fiscal impact analysis and benefit cost analysis. Dual listed with AGEC 5600. *Prerequisites:* ECON 3010, 3020, and MATH 1400.

4640. Advanced Farm/Ranch Management. 3. Tools of management decision-making applied to problems of farm-ranch management and resource acquisition and use. *Prerequisites:* AGEC 1020, 2020 and MATH 1400. (Normally offered fall semester)

4660. Community and Economic Development. 3. Community development from an interdisciplinary perspective, integrating theory, concepts and methods from sociology, economics, political science, and community development. Students learn how community theory can be used to design and support effective economic development programs. Includes readings, lectures, guest lectures, field trips and community analysis projects. Dual listed with AGEC 5660. *Prerequisites:* AGEC/ECON 1010, 1020, and junior standing.

4700. Economics of Range Resources. 3. Applies economic and decision theory to management and allocation of public and private range resources. *Prerequisite:* AGEC 1020 or equivalent. (Normally offered spring semester)

4710. Natural Resource Law and Policy. 3. Legal and economic examination of laws intended to resolve environmental conflicts. Surveys economic rationales both for private property and government intervention in environmental disputes; content of selected environmental laws in the U.S.; and basic principles of environmental mediation. *Prerequisites:* AGEC 1020, ECON 1020 or equivalent and 3 hours of business law or agricultural law. (Normally offered fall semester of even-numbered years)

4720. Water Resource Economics. 3. Presents principles and procedures appropriate to water resource allocation and development decisions. Studies agricultural, recreational, industrial and other uses of water. *Prerequisite:* AGEC 1020 or equivalent; QB course, WB course; senior standing.

4830. Agricultural Commodities and Futures Markets. 3. Economics of price determination for agricultural commodities and development of pricing strategies in cash and futures markets. *Prerequisite:* AGEC 1020 or equivalent. (Normally offered fall semester)

4840. Agricultural Market Analysis. 3. Applies economic theory to an analysis of economic organization and operation of agricultural markets, including price behavior. *Prerequisites:* MATH 1400 and ECON 3020. (Normally offered spring semester of odd-numbered years)

4880. International Agricultural Trade, Markets and Policy. 3. [G▶(none)] International agricultural commodity markets, product markets and market channels are characterized and examined. Presents economic theory relevant to description and analysis of international markets. Characterizes and analyzes historical and contemporary U.S. commercial trade policy and agricultural policy and their effect on markets. *Prerequisites:* ECON 3020 and junior or senior standing. (Normally offered spring semester of even-numbered years)

4890. Special Topics in _____. 1-3 (Max. 6). Accommodates seminar series or course offering by visiting faculty whose subject matter is not included in other courses. *Prerequisites:* junior standing and/or consent of instructor. (Offered based on sufficient demand and resources)

4910. Problems in Agricultural Economics. 1-3 (Max. 6). Consists of supervised study and investigation on topics of current importance in agricultural economics. *Prerequisites:* 12 hours in AGEC or ECON and consent of instructor.

4930. Agricultural Economics Internship. 1-6 (Max. 6). Provides practical agricultural business firm and/or agency experience.

Develops working knowledge of how basic economic concepts are used by firms and agencies in policy and procedures development and decision making by the organization. *Prerequisites:* 10 hours of AGEC and approval of faculty supervisor.

4965. Agribusiness Entrepreneurship. 3. [WC♦COM3] Designed for students preparing to launch or work with an entrepreneurial venture. Students develop a business plan, synthesizing knowledge of agricultural economics, agribusiness management and finance, human resources and accounting. Emphasis is placed on advancing student professional communication abilities for agribusiness management careers. *Prerequisites:* senior standing, WB/COM2 writing course and AGEC 2020, or AGEC 4500, or AGEC 4060, or FIN 3250.

4970. Technical Communication for Agribusiness. 3. [(none)♦COM3] This course is the senior capstone for agribusiness majors. Students will use written, oral, and digital communication appropriate for the discipline to complete a technical report and oral presentation on a complex topic affecting agriculture or natural resources.

5200. Gender and Race in the Economy. 3. Focuses on the role gender and race play in the economy; specifically the way that gender and race affect economic outcomes for individuals in the United States. Cross listed with WMST 5200. Dual listed with AGEC 4200. *Prerequisites:* AGEC 1020 or equivalent, or SOC 1000, or WMST 1080, and WB/COM2.

5230. Intermediate Econometric Theory. 3. Covers simple and multiple regression models, problems of estimation, hypothesis and diagnostic testing, dummy variables, autoregressive and distributed lag models, and time-series analysis. The objective is to understand the underlying theory of econometric modeling and obtain operational ability to construct, estimate, and test econometric models. Dual listed with AGEC 4230; cross listed with ECON 5230. *Prerequisites:* ECON 3020, STAT 2050 and MATH 2350.

5310. Theory of Producer Behavior. 3. Economic models of optimization as they apply to firm-level production decisions. Topics include the properties of production functions, theories of linear and non-linear optimization, firm decision making under perfect and imperfect competition and firm decision making under uncertainty. *Prerequisites:* ECON 3020, STAT 2050 and MATH 2350.

5320. Quantitative Methods in Agricultural Economics. 3. Covers mathematical programming and simulation techniques for solving applied problems in agricultural economics. Emphasizes the formulation of

economic research problems in quantitative terms and the use of computer software packages to derive solutions. *Prerequisites:* ECON 3020, STAT 2050 and MATH 2350.

5450. Negotiation. 3. Examines how to use negotiation to resolve conflict and get agreement. Describes conflict; outlines ways to address conflict; examines different negotiation strategies and the impact of cognitive bias, power, ethics, and individual and cultural differences; and explores mediation practices. Students complete negotiations, role-plays, and questionnaires. Cross listed with ENR 5450. Dual listed with AGEC 4450. *Prerequisite:* completion of USP O/COM2 requirement; junior standing or consent of instructor.

5550. Negotiation Analysis. 3. Focuses on using an analytical perspective for maximizing joint gains between negotiators. Students learn analytical techniques to prepare for negotiation, evaluate options and proposals during a negotiation, and evaluate negotiated outcomes with respect to maximization of joint gains and fairness criteria. Dual listed with AGEC 4550; Cross listed with ENR 5550. *Prerequisite:* QA/Q.

5600. Community Economic Analysis. 3. Analysis of regions and rural communities; their problems, socioeconomic characteristics, land use and economic development. Provides training in regional economic theory, regional economic analysis, fiscal impact analysis and benefit cost analysis. *Prerequisite:* consent of instructor.

5630. Advanced Natural Resource Economics. 3. An in-depth treatment of theoretical issues, quantitative techniques, and institutional arrangements in the natural resource field. Topics include welfare economics, property rights, market failure and externalities, and benefit cost analysis. *Prerequisites:* ECON 3010 and 3020, STAT 2050 and MATH 2350.

5650. Communicating Research. 3. Focuses on the broad methods, and written and oral communication of research in applied economics. Topics include formulating a research question, organizing a manuscript, editing for clarity and conciseness, building effective figures and tables, finding and citing literature, developing and delivering effective presentations, and upholding research ethics. *Prerequisites:* graduate standing.

5660. Community and Economic Development. 3. Community development from an interdisciplinary perspective, integrating theory, concepts and methods from sociology, economics, political science, and community development. Students learn how community theory can be used to design and support effective economic development programs.

Includes readings, lectures, guest lectures, field trips and community analysis projects. Dual listed with AGEC 4660. *Prerequisite:* AGEC/ECON 1020 or SOC 2090 and junior standing.

5710. Advanced Agricultural Market Theory. 3. Theoretical foundations of the study of agricultural markets and how business is conducted in those markets. Topics include pure competition, industrial organization concepts related to imperfect competition including game theory, principal-agent theory, transaction costs economics, intermediary theory, and welfare implications of alternative agricultural market structures. *Prerequisites:* ECON 3020 and MATH 2350.

5740. Consumer Behavior and Prices Analysis. 3. Focuses on microeconomic consumer theory and its application. Topics include utility theory, market demand theory, expected utility theory, and econometric applications. *Prerequisites:* ECON 3020, MATH 2350 and STAT 2050.

5880. Advanced Seminar. 1-2 (Max. 2). Involves reporting to the seminar group on research methods and results obtained in the investigation of a topic or question relevant to the field of agricultural economics. *Prerequisite:* 9 credits in AGEC and/or ECON.

5890. Advanced Problems in Agricultural Economics. 1-3 (Max. 6). Supervised study and research on current problems in marketing, farm and ranch management, policy prices, land economics or finance. *Prerequisite:* graduate standing in AGEC or ECON.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5960. Thesis Research. 1-12 (Max. 24). Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrolled in a graduate degree program.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

Department of Animal Science

101 Animal Science/Molecular Biology

Bldg., (307) 766-2224

FAX: (307) 766-2355

Web site: uwyo.edu/anisci

Department Head: Bledar Bisha –

Interem

Professors:

BRENDA M. ALEXANDER, B.S. University of Wyoming 1986; M.S. 1988; Ph.D. 1999; Professor of Animal Science 2019, 2006.

BRET W. HESS, B.S. University of Nevada, Reno 1991; M.S. 1993; Ph.D. University of Missouri-Columbia 1996; Professor of Ruminant Nutrition 2008, 2002.

DANIEL C. RULE, B.S. University of California, Davis 1977; M.S. 1980; M.S. Washington State University; Ph.D. Iowa State University 1984; Professor of Animal Science 1999, 1987.

Associate Professors:

BLENDAR BISHA, D.V.M. Agricultural University of Tirana-Albania 1999; M.S. Iowa State University 2004; Ph.D. 2009; Assistant Professor of Animal Science 2013.

SCOTT L. LAKE, B.S. University of Nevada 1998; M.S. 2001; Ph.D. University of Wyoming 2005; Associate Professor of Animal Science 2014, 2008. Extension Livestock Specialist.

PAUL A. LUDDEN, B.S. University of Nebraska-Lincoln 1991; M.S. Purdue University 1994; Ph.D. University of Missouri-Columbia 1997; Associate Professor of Ruminant Nutrition 2004, 1998.

WARRIE J. MEANS, B.S. Colorado State University 1979; M.S. 1982; Ph.D. 1985; Associate Professor of Animal Science 2002, 1992.

STEVEN I. PAISLEY, B.S. University of Wyoming 1993; M.S. 1995; Ph.D. Oklahoma State University 1998; Extension Beef Cattle Specialist; Associate Professor of Animal Science 2007, 2001.

Assistant Professors:

JEREMY BLOCK, B.S. University of Missouri 1998; M.S. University of Florida 2003; Ph.D. 2007

HANNAH C. CUNNINGHAM-HOLLINGER, B.A. St. Olaf College 2012; M.S. University of Wyoming 2014; Ph.D. 2018; Assistant Professor of Animal Science 2019.

WHIT STEWART, B.S. Brigham Young University-Idaho 2008; M.S. Oregon State University 2010; Ph.D. New Mexico State University 2015; Assistant Professor of Animal Science 2017.

Academic Professional Lecturers:

CALEB BOARDMAN, B.S. Texas A&M University 2012; M.S. 2014; Academic Professional Lecturer in Animal Science 2015.

McKENSIE K. HARRIS, B.S. University of Wyoming 2015; M.S. Texas A&M University 2017; Assistant Lecturer in Animal Science 2018.

JENNIFER A. INGWERSON, B.S. University of Nebraska-Lincoln 2005; M.S. Iowa State University 2014; Academic Professional Lecturer in Animal Science 2014.

SIERRA JEPSEN, B.S. The Ohio State University 2017; Assistant Lecturer in Animal Science 2019.

Adjunct Professors:

Kristi Cammack, Jeff Chandler, Thomas Hansen, John Johnston, Tom McDonald, Peter Nathanielsz, Mark Nijland, Heywood Sawyer, Donal Skinner, D. Paul Thomas, Meijun Zhu

Professors Emeriti:

Ray Field, Frank Hinds, Doug Hixon, Steven W. Horn, Conrad Kercher, Richard J. McCormick, Gary Moss, William Murdoch, Johannes Nel, Bibek Ray

The Department of Animal Science offers a variety of courses in animal and food science. The department uses modern laboratories and excellent animal facilities including a livestock teaching arena and a meat processing facility.

The Department of Animal Science and the Department of Veterinary Science have a combined curriculum, under Animal and Veterinary Science (ANVS). The curriculum has options in production, range livestock, business, communication, animal biology, preveterinary medicine, meat science and food technology, and equine science. The curriculum leads to a wide variety of career opportunities for animal and veterinary science graduates.

Animal and veterinary science

The Department of Animal Science and the Department of Veterinary Sciences have combined their efforts to offer several degree options leading to the bachelor of science degree in animal and veterinary science. Courses in animal science, food science, and pathobiology are the core offerings in the various options.

Agriculture, in its broadest definition, is the nation's largest industry. Livestock production is Wyoming's largest agricultural enterprise. Animal agriculture and its associated industries offer many opportunities for

the interested student. Whether a student is interested in production livestock, allied fields such as meat science, business or animal health, or wants to apply to a college of veterinary medicine, the degree tracks offered will form the basis for a challenging career in animal agriculture/biology. The various options provide maximum flexibility to meet the changing needs of students and their employers. For students interested in pursuing advanced research, M.S. and Ph.D. degrees are offered.

Several degree options allow for specialization and graduate or professional school preparation. A brief description of each option and the educational opportunities they provide is given with the course requirements.

A grade of C or better must be earned in the following courses when the courses are required in the individual option for completion of the degree: ANSC 3010, 3100, 4120, 4540, 4630; FDSC 3060, PATB 4110, PATB 4111, LIFE 1010, 2022.

Students are encouraged to participate in activities related to their degree option. The university has livestock, horse and meats judging teams. Each team travels and participates in at least one major exposition a year. Each year, the Academic Quadrathlon competition is held, combining practical and classroom skills for students. Field trips, as practical teaching aids in many classes, are scheduled throughout the year. Internships are available to gain practical experience. Student organizations such as the Block and Bridle Club, Food Science Club, Microbiology Club, Range Club, the Pre-vet Club, Wyoming Collegiate Cattlemen Association, and the Ranch Horse Team provide additional educational and recreational opportunities.

Production Option

This option provides a strong background in livestock production and management. Students interested in livestock production should enroll in this option.

Animal and Veterinary Science.....

Required courses: ANSC 1010, 2020, 3010*, 3100*, 4120*, 4540*, 4630* (COM3) and two courses selected from ANSC 3150, 4220, 4230, 4240, or 4250; PATB 4110*

Agricultural Sciences

Required courses: FDSC 2040, 3060*; AGECE 1020, 2020; REWM 2000

Other math/science courses

Required courses: LIFE 1010* (PN), 2022*, 3050; CHEM 1000 (PN), ANSC 2010 or CHEM 2300, MATH 1400 (Q); STAT 2050 or 2070

Other communication courses.....
 ENGL 1010* (COM1) and a COM2*
 course
 Other University Studies courses
 First-Year Seminar* (FYS), 2 courses
 in Human Culture (H), and U.S. and
 Wyoming Constitutions (V)

Required credits 128**

*A grade of C or better must be earned in these courses for successful completion of degree.

**Required credits: 128 total credit hours, 42 credit hours or more at the 3000-level or above.

Range Livestock Option

This option emphasizes range livestock management. Students interested in the management of livestock and range resources should enroll in this option.

Animal and Veterinary Science.....
 Required courses: ANSC 1010, 3010*,
 3100*, 2020, 4120*, 4150, 4220, 4230
 or 3150, 4540*, 4630* (COM3); PATB
 4110*

Rangeland Ecology and Watershed
 Management
 Required courses: REWM 2000, 2400,
 4000, 4330; LIFE 3400

Agricultural Sciences
 Required courses: FDSC 2040, 3060*;
 AGECE 1020, 2020

Other math/science courses.....
 Required courses: LIFE 1010* (PN),
 2022*, 3050; CHEM 1000 (PN), ANSC
 2010 or CHEM 2300, MATH 1400(Q);
 STAT 2050 or 2070

Other communication courses.....
 ENGL 1010* (COM1) and a COM2*
 course

Other University Studies courses
 First-Year Seminar* (FYS), 2 courses
 in Human Culture (H), and U.S. and
 Wyoming Constitutions (V)

Required credits 128**

*A grade of C or better must be earned in these courses for successful completion of degree.

**Required credits: 128 total credit hours, 42 credit hours or more at the 3000-level or above.

Business Option

Students desiring a strong background in business in addition to the basic courses in animal and veterinary science should enroll in this option. Graduates will be qualified for careers in the livestock agribusiness industry.

Animal and Veterinary Science.....
 Required courses: ANSC 1010, 2020,
 3010*, 3100*, 4120*, 4540*, 4630*
 (COM3) and two courses selected from
 ANSC 3150, 4220, 4230, 4240, or 4250;
 PATB 4110*

Agricultural Economics and Business.....
 Required courses: AGECE 1010, 1020, 3860
 or 4880; AGECE 4060 or MGT 3210;
 AGECE 4050 or MKT 3210; ACCT 2010

Agricultural Sciences
 Required course: FDSC 3060*

Other math/science courses
 Required courses: LIFE 1010* (PN),
 2022*, 3050; CHEM 1000 (PN), ANSC
 2010 or CHEM 2300, MATH 1400 (Q);
 STAT 2050 or 2070

Other communication courses.....
 ENGL 1010* (COM1) and a COM2*
 course

Other University Studies courses
 First-Year Seminar* (FYS), 2 courses
 in Human Culture (H), and U.S. and
 Wyoming Constitutions (V)

Required credits 128**

*A grade of C or better must be earned in these courses for successful completion of degree.

**Required credits: 128 total credit hours, 42 credit hours or more at the 3000-level or above.

Communication Option

Students in this option obtain a basic education in animal and veterinary science and also acquire in-depth communication skills. Students interested in careers in agriculture communications with emphasis on the livestock industry should enroll in this option.

Animal and Veterinary Science.....
 Required courses: ANSC 1010, 2020,
 3010*, 3100*, 4120*, 4540*, 4630*
 (COM3) and two courses selected from
 ANSC 3150, 4220, 4230, 4240, or 4250;
 PATB 4110*

Communication
 Required courses: COJO 2010* (COM2),
 plus 14 additional credit hours in COJO

Agricultural Sciences
 Required course: FDSC 3060*

Other math/science courses
 Required courses: LIFE 1010* (PN),
 2022*, 3050; CHEM 1000 (PN), ANSC
 2010 or CHEM 2300, MATH 1400 (Q);
 STAT 2050 or 2070

Other communication course
 ENGL 1010* (COM1)

Other University Studies courses
 First-Year Seminar* (FYS), 2 courses
 in Human Culture (H), and U.S. and
 Wyoming Constitutions (V)

Required credits 128**

*A grade of C or better must be earned in these courses for successful completion of degree.

**Required credits: 128 total credit hours, 42 credit hours or more at the 3000-level or above.

Animal Biology Option

This option within the major requires more complete and stringent basic sciences. Students may complete premedical requirements or other pre-professional allied health requirements while completing a B.S. degree that prepares them for alternate career choices. Selected courses provide opportunity for more complete exposure in both biological sciences and pathobiology. Possible alternatives to professional schools include graduate school admission or employment by government or industry in research, promotion or sales.

Because of the variation in pre-professional requirements for different professional programs, students are encouraged to determine the specific requirements of the programs in which they are interested.

Animal and Veterinary Science.....
 Required courses: ANSC 1010, 3010*,
 3100*, 4120*, 4630* (COM3); PATB
 4400

Agricultural Sciences
 Required courses: FDSC 3060*; MICR/
 MOLB 2021 or 2240; MOLB 3610 and
 4100 or MOLB 4600 and 4610

Other math/science courses.....
 Required courses: LIFE 1010* (PN),
 2022*, 3050; CHEM 1020 (PN), 1030,
 2300 or CHEM 2420 and 2440; PHYS
 1050, 1110, or 1120; ZOO/PSYC 3600;
 MATH 1400, 1405, or 1450; STAT 2050
 or 2070

Other communication courses.....
 ENGL 1010* (COM1) and a COM2*
 course

Other University Studies courses
 First-Year Seminar* (FYS), 2 courses
 in Human Culture (H), and U.S. and
 Wyoming Constitutions (V)

Required credits 128**

*A grade of C or better must be earned in these courses for successful completion of degree.

**Required credits: 128 total credit hours, 42 credit hours or more at the 3000-level or above.

Meat Science and Food Technology Option

Students taking this option will have an excellent background for entering the meat industry. The food industry is the largest employer in this country and offers a wide variety of career opportunities.

Animal and Veterinary Science.....
 Required courses: ANSC 1010, 3010*,
 3100*, 4050, 4630* (COM3); PATB
 4110*

Food Science
 Required courses: FDSC 1410, 2040, 3060*, 3062, 3063, 4090*, 4100, 4720*, 4900*

Agricultural Sciences
 Required courses: AGECE 1020, AGECE 3860, MICR/MOLB 2021

Other math/science courses
 Required courses: LIFE 1010* (PN), 2022*; CHEM 1000 (PN), ANSC 2010 or CHEM 2300, MATH 1400 (Q); Stat 2050 or 2070

Other communication courses.....
 ENGL 1010* (COM1) and a COM2* course

Other University Studies courses
 First-Year Seminar* (FYS), 2 courses in Human Culture (H), and U.S. and Wyoming Constitutions (V)

Suggested courses.....
 FDSC 3061; FCSC 1141
Required credits 128**

*A grade of C or better must be earned in these courses for successful completion of degree.

**Required credits: 128 total credit hours, 42 credit hours or more at the 3000-level or above.

Pre-Veterinary Medicine Option

This option is especially designed to prepare students for application to colleges of veterinary medicine. There is a strong emphasis on the biological, biomedical and physical sciences. This curriculum is also appropriate for students wishing to pursue graduate school opportunities, other professional school applications, or careers in many areas of agribusiness. A minimum of three years of formal course work is required before one can apply to a college of veterinary medicine. Students accepted before completion of their B.S. degree can transfer credits back to UW to complete their degree requirements. Wyoming does not have a college of veterinary medicine. Faculty advisers insure that students meet the variable preveterinary requirements for application to colleges of veterinary medicine in their home state or region.

Animal and Veterinary Science.....
 Required courses: ANSC 3010*, 3100*, 4120*;one course selected from ANSC 3150, 4220, 4230, or 4250; PATB 4110*, 4400, 4500, 4710

Agricultural Sciences
 Required courses: MICR/MOLB 2021, 2220; MOLB 3610

Other math/science courses
 Required courses: LIFE 1010* (PN), 2022*, 3050; CHEM 1020 (PN), 1030, 2420, 2440; PHYS 1110, 1120; MATH 1400 (Q), 1405 (Q); STAT 2050 or 2070

Other communication courses.....
 ENGL 1010* (COM1), a COM2* course, ANSC 4630* (COM3) or other COM3* course

Suggested courses
 ANSC 4050, 4132, 4150, 4260, 4540; FDSC 3060; PATB 4001, 4130, 4170, 4360; ANSC/PATB 4111

Other University Studies courses
 First-Year Seminar* (FYS), 2 courses in Human Culture (H), and U.S. and Wyoming Constitutions (V)

Required credits 128**

*A grade of C or better must be earned in these courses for successful completion of degree.

**Required credits: 128 total credit hours, 42 credit hours or more at the 3000-level or above.

Equine Science Option

This option provides a strong background in equine production and management. Students interested in equine should enroll in this option.

Animal and Veterinary Science.....
 Required courses: ANSC 1010, 1030, 3010*, 3100*, 3150*, 3250, 4120, 4132, 4250*, 4540*, 4630* (COM3); ANSC/PATB 4111*

Agricultural Sciences
 Required courses: FDSC 3060; AGECE 2020; REWM 2000

Horsemanship
 2 advisor/department head approved courses

Other math/science courses
 Required courses: LIFE 1010* (PN), 2022*, 3050; CHEM 1000 (PN), ANSC 2010 or CHEM 2300, MATH 1400 (Q); STAT 2050 or 2070

Other communication courses.....
 ENGL 1010* (COM1) and a COM2* course

Other University Studies courses
 First-Year Seminar* (FYS), 2 courses in Human Culture (H), and U.S. and Wyoming Constitutions (V)

Required credits 128**

*A grade of C or better must be earned in these courses for successful completion of degree.

**Required credits: 128 total credit hours, 42 credit hours or more at the 3000-level or above.

Agriculture Education with Concurrent Major in Animal and Veterinary Science

This program consists of 128 total hours. Minimum 2.750 cumulative GPA and minimum 2.500 content GPA required. This major will be advised in the College of Education

with a secondary adviser in Animal Science. Refer to the College of Education for specific curriculum requirements.

Undergraduate Minors

The Departments of Animal Science and Veterinary Sciences offers two minors: a minor in animal and veterinary science for non-majors and a minor in Equine Science.

Animal and Veterinary Science Minor

The courses required for this minor must be taken for a letter grade and the student must receive a grade of C or better in each course. Courses required are: ANSC 3010, 3100, 4120, 4540; FDSC 3060; PATB 4110 and at least one of the following: ANSC 3150, 4220 or 4230. The Department of Animal Science or Veterinary Sciences undergraduate minor adviser may be contacted by students needing assistance or having questions.

Equine Science Minor

The courses required for this minor must be taken for a letter grade and the student must receive a grade of C or better in each course.

Core Courses - 12 total credit hours

ANSC 1030	3
ANSC 3150	3
ANSC 3250	3
ANSC/PATB 4111	3
Electives - must choose 3 courses minimum (minimum of 8 credits) - 8 to 10 total credit hours	
ANSC 2020	4
ANSC 3555	3
ANSC 3560*	1-2
ANSC 4132	2
ANSC 4250	3

*Maximum of 3 credits allowed in ANSC 3560

Graduate Study

The Departments of Animal Science and Veterinary Science offer programs leading to the M.S. (Plan A and Plan B) and Ph.D. degrees in animal and veterinary science. A M.S. degree in food science and human nutrition is offered in cooperation with the Department of Family and Consumer Sciences. The Department of Animal Science also participates in the interdisciplinary M.S./Ph.D. Reproductive Biology Program which has morphed into Biomedical Science Program.

Program Specific Degree Requirements

Master's Program - Plan A (thesis)

The student, major professor, and graduate committee determine the program of study and research project, which meets the needs of the individual student. The candidate's graduate committee should be established and functioning by the time the student has completed 12 semester hours of formal coursework. The master of science program should be approved and filed by the end of the student's second semester of graduate study in animal science. This committee shall also determine if the student is making satisfactory progress to be advanced to a candidate for a master's degree or continued in a doctoral program by the end of the student's third semester following matriculation.

The student can specialize in breeding, food science and human nutrition, nutrition, physiology, meat science, reproduction or wool for coursework and thesis/dissertation project. In addition, supporting coursework is available in agricultural economics, biochemistry, microbiology, range management, genetics, statistics, and other areas of interest to the individual. In certain cases it is possible to develop a joint research project between animal science and another department.

Students may use the research facilities and herds of beef cattle, sheep, and swine at the university livestock center near the university or at one of the university research and extension centers in the state. Research laboratories are located on campus and include a modern meat processing facility.

The Plan A program is a 30 hour program, 26 hours of coursework and 4 hours of thesis research.

Master's Program - Plan B (non-thesis)

The Plan B program requires a coursework-intensive, non-thesis master of science program for those students whose career paths may not require a thesis research program.

The program requires 32 hours of coursework in addition to an acceptable non-thesis research paper as defined by the student's graduate committee.

Doctoral Program

The program requires 72 hours. Students must follow minimum graduate requirements.

Animal Science (ANSC)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1009. Introduction to Animal Science for 4-H/Youth. 4. Introduction to the field of animal science, including meat and dairy products, nutrition, reproduction, breeding and genetics, livestock selection, and diseases and health of domestic livestock species, with application to the management of beef cattle, sheep and wool, dairy cattle, swine, and horses. Intended for high school undergraduates.

1010. Introduction to Animal Science. 4. Introduction to the field of animal science, including meat and dairy products, nutrition, reproduction, breeding and genetics, livestock selection, and diseases and health of domestic livestock species, with application to the management of beef cattle, sheep and wool, dairy cattle, swine, and horses. (Normally offered fall semester)

1030. Equine Management. 3. An overview of the horse industry and proper way to manage horses. (Normally offered spring semester)

1070. Livestock Fitting and Showing. 1. Teaches fitting and showing techniques for domestic livestock. Students will have the opportunity to fit an animal of their choice and participate in the Little International Livestock Show at the Animal Science Livestock Center. (Normally offered fall semester)

1101. First-Year Seminar. 3. [(none)◀▶FYS]
2010. Domestic Animal Metabolism. 3. Integrates cellular and whole-animal metabolism through introduction to metabolic regulation. Introduces students to the nomenclature, structures and functions of cellular metabolites and vitamins. Knowledge of chemical structure will be applied to cellular reactions in various tissues of domestic animals. Ruminants and non-ruminants will be contrasted. *Prerequisite:* CHEM 1000. (Normally offered fall semester)

2020. Feeds and Feeding. 4. Nutrient classification and use, feed value, ration formulation and feeding domestic animals. (Normally offered spring semester)

2035. Companion Animal Nutrition. 3. Nutrition and biology of digestion of companion/pet animals. Fundamentals of nutrition and the nutrients, as well as appropriate terminology will be covered, with direct application to companion animals. (Normally offered spring semester)

2070. Livestock Behavior and Handling. 2. Teaches basic behavior of livestock species including cattle, swine, sheep and goats. Apply

knowledge to effectively learn humane handling techniques and facility design for low-stress management. *Prerequisite:* ANSC 1010.

3010. Comparative Anatomy and Physiology of Domestic Animals. 4. Teaches comparative anatomy and physiology of digestion, circulation, production, reproduction and environment of farm animals. *Prerequisites:* LIFE 1010 and 2022, or concurrent registration with LIFE 2022. (Normally offered spring semester)

3100. Principles of Animal Nutrition. 3. Description of the nutrients, nutrient digestion and absorption, and nutrient function within the body of various domesticated animals. *Prerequisite:* CHEM 2300 or ANSC 2010. (Normally offered spring semester)

3150. Equine Nutrition and Physiology. 3. Provides general knowledge of nutrition, physiology and biochemistry of exercise and reproductive processes of equine. *Prerequisite:* 4 hours of biology. (Normally offered fall semester)

3250. Equine Behavior and Welfare. 3. To familiarize students with an equine interest about behavior, learning, and welfare issues associated with management and training of equine. *Prerequisites:* ANSC 1030, ANSC 3150. (Normally offered fall semester)

3535. Introduction to Wool Evaluation. 2. Objectively evaluate raw wool characteristics and quality determining factors across various wool grades and breed types. Particular emphasis will be given to how quality determining factors influence replacement selection and the end product produced. Competitive wool judging format will be used to enhance organizational skills, wool judging terminology, oral articulation skills. *Prerequisite:* ANSC 1010.

3540. Collegiate Wool Judging. 1. Students representing the university in regional and national wool intercollegiate contests are selected from this course. *Prerequisite:* ANSC 3535.

3545. Introduction to Livestock Evaluation. 3. Objectively evaluate livestock species including cattle, sheep, swine, and goats for both market and breeding standards. Improve communication skills and terminology through oral and written reasons. Gain an understanding of expected progeny differences and how they relate to selection and livestock production. *Prerequisite:* FDSC 2040 or instructor approval.

3550. Advanced Livestock Evaluation. 1-2 (Max. 3). Students representing the university in national and regional contests are selected from this course. Requires field trips. *Prerequisite:* ANSC 3545.

3555. Equine Evaluation and Selection. 3 (Max. 6). Objectively evaluate equine for performance and breeding purposes according to breed standards and or discipline. Emphasis will be placed on learning how conformation relates to overall function and longevity of equine. Competitive horse judging team criteria will be used to build organizational skills, equine terminology, and communication skills. *Prerequisites:* ANSC 1010 and ANSC 1030.

3560. Advanced Equine Evaluation and Selection. 1-2 (Max. 3). Objectively evaluate equine for halter and performance according to breed standards and or discipline. Competitive horse judging team criteria will be used to build organizational skills, equine terminology, and communication skills. Students will compete as members of the Collegiate Horse Judging Team and represent University of Wyoming at national horse judging competitions. *Prerequisites:* ANSC 3555.

3650. Exploring Graduate Study in Animal Science. 1. Gives undergraduates the opportunity to explore graduate studies in Animal Science. Discussions center on graduate program searches, applications, and interviews as well as graduate student responsibilities and career possibilities. Undergraduates are paired with graduate student mentors, participate in data collection, and attend departmental seminars. *Prerequisites:* consent of instructor, junior standing and 3.000 GPA or higher recommended.

4050. Animal Growth and Development. 3. Explores aspects of animal growth and development, with a focus on skeletal muscle, adipose, soft connective tissues, and bone. Addresses genetic, endocrine, nutritional, and environmental impacts on tissue development and growth. Dual listed with ANSC 5050. *Prerequisite:* LIFE 2022. (Normally offered spring semester)

4061. Cell Signaling. 3. Cell signaling pathways in animal growth and development. Defines how cells respond to external stimuli. Includes: G-protein couple signaling, calcium signaling, growth factor associated signaling, redox signaling, lipid related signaling, and apoptosis. Dual listed with ANSC 5061. *Prerequisites:* MOLB 3610 or an equivalent biochemistry or cell biology course. (Normally offered fall semester of alternative years)

4100. Nutritional Management. 3. Integration and application of the principles of nutrition. Addresses nutrient requirements, feed composition and nutritional value, in addition to feeding management strategies for various classes of farm animals. Provides practical nutritional experience through laboratory. Dual listed with ANSC 5100. *Prerequisite:* ANSC 3100.

4111. Equine Health and Disease. 3. To familiarize students with identification, prevention and treatment of diseases in horses through proper health management techniques. Dual listed with ANSC 5111. Cross listed with PATB 4111. *Prerequisites:* ANSC 1030, ANSC 3150. (Normally offered spring semester)

4120. Principles of Mammalian Reproduction. 3. Overview of the anatomy, physiology, endocrinology and biochemistry of reproductive processes in male and female mammals. Dual listed with ANSC 5120. *Prerequisite:* a course in systemic anatomy and physiology/endocrinology. (Normally offered fall semester)

4130. Management of Reproduction. 3. Lecture-laboratory course. Introduces methods of manipulating reproduction within livestock management systems. Includes artificial insemination, diagnosis of pregnancy, induction and control of estrus and ovulation, induction of parturition, embryo transfer and control and prevention of diseases. *Prerequisite:* ANSC 4120. (Normally offered spring semester)

4132. Equine Reproduction. 2. Introduces methods of manipulating reproduction within equine management systems. Includes artificial insemination, diagnosis of pregnancy, induction and control of estrus and ovulation, parturition, embryo transfer, and control and prevention of equine reproductive diseases. *Prerequisites:* ANSC 4120 and ANSC 3150. (Normally offered spring semester)

4150. Physiology of Ruminant Digestion. 3. Anatomical structure, function and symbiotic relationship of ruminant digestive system. Dual listed with ANSC 5150. *Prerequisite:* ANSC 3100. (Normally offered fall semester)

4210. Wool Structures and Properties. 2. Chemical structure and reactions of wool fiber, as well as physical properties as related to structure. *Prerequisite:* CHEM 2300 or equivalent.

4220. Advanced Beef Production and Management. 3. Integrates animal breeding, nutrition and reproductive physiology in beef production management schemes. Emphasizes analysis and decision making. Consists of two hours of lecture and two hours of lab, with approximately one-half of labs meeting at Animal Science Livestock Center. *Prerequisites:* ANSC 3100, 4120, 4540. (Normally offered spring semester)

4230. Advanced Sheep Production Management. 3. Integrates animal breeding, nutrition and reproductive physiology in sheep production management schemes. *Prerequisites:* ANSC 3100, 4120, 4540. (Normally offered spring semester)

4240 [3330]. Advanced Swine Production and Management. 3. Integrates animal breeding, nutrition and reproductive physiology in swine production management schemes. Consists of two hours of lecture and two hours of lab, with at least one-half of labs meeting at Animal Science Livestock Center. *Prerequisites:* ANSC 3100, 4120, or 4540.

4250. Advanced Equine Production and Management. 3. A capstone course for students wanting to pursue a career in the equine industry with main focus on equine management. Business applications, health, facilities, and management will be explored in depth. Integrates equine breeding, nutrition, and reproductive physiology in equine production management schemes. *Prerequisites:* ANSC 1030, 3100, 4120, and 4540. (Normally offered spring semester)

4260. Mammalian Endocrinology. 3. Introduces principles of endocrinology, role of endocrine systems in regulating metabolism, growth, reproduction and lactation in mammals. Dual listed with ANSC 5260. *Prerequisite:* ANSC 3010, ZOO 3115, or equivalent. (Normally offered fall semester)

4500. Problems in Animal Science. 1-3 (Max. 6). Provides opportunity for students to conduct supervised research in breeding, genetics, management, nutrition and physiology. *Prerequisites:* 6 hours in animal science and consent of instructor.

4540. Principles of Animal Breeding. 3. Discusses genetic principles underlying animal improvement; introductory population genetics; heritability; systems of mating; and selection. Dual listed with ANSC 5540. *Prerequisite:* STAT 2050 or 2070. (Normally offered fall semester)

4550. Internship in Animal Science. 2 (Max. 8). Provides opportunities to acquire experience in a field of interest to the student. Offers learning experiences that are difficult, if not impossible, to realize in classroom settings. Following off-campus educational experience, students are more able to evaluate potential career opportunities and select additional classes on-campus to complement career direction. Offered S/U grade only. *Prerequisites:* sophomore standing; 2.500 GPA.

4630. Topics and Issues in Animal Science. 3. [WC♦COM3] Writing-intensive course that focuses on writing projects related to current topics and issues in animal science. Emphasizes writing skills, strategies, information gathering and critical judgment. Assignments include short and long papers, resumes, letters of transmittal, and oral presentations. *Prereq-*

quisites: senior standing and completion of WA and WB or COM1 and COM2 requirements. (Normally offered spring semester)

4900. Undergraduate Teaching Practicum. 1-2 (Max. 4). Participation of undergraduates in the teaching of ANSC or FDSC courses under the supervision of ANSC faculty/staff. Offered Satisfactory/Unsatisfactory only. *Prerequisite*: junior standing and consent of instructor.

5050. Animal Growth and Development. 3. Explores aspects of animal growth and development, with a focus on skeletal muscle, adipose, soft connective tissues, and bone. Addresses genetic, endocrine, nutritional, and environmental impacts on tissue development and growth. Dual listed with ANSC 4050. *Prerequisite*: LIFE 2022. (Normally offered spring semester)

5061. Cell Signaling. 3. Cell signaling pathways in animal growth and development. Defines how cells respond to external stimuli. Includes: G-protein couple signaling, calcium signaling, growth factor associated signaling, redox signaling, lipid related signaling, and apoptosis. Dual listed with ANSC 4061. *Prerequisite*: MOLB 3610 or an equivalent biochemistry or cell biology course. (Normally offered fall semester of alternative years)

5100. Nutritional Management. 3. Integration and application of the principles of nutrition. Addresses nutrient requirements, feed composition and nutritional value, in addition to feeding management strategies for various classes of farm animals. Provides practical nutritional experience through laboratory. Dual listed with ANSC 4100. *Prerequisite*: ANSC 3100.

5111. Equine Health and Disease. 3. To familiarize students with identification, prevention and treatment of diseases in horses through proper health management techniques. Dual listed with ANSC 4111. Cross listed with PATB 5111. *Prerequisites*: ANSC 1030, ANSC 3150. (Normally offered spring semester)

5120. Principles of Mammalian Reproduction. 4. In addition to attendance in the lecture component of this course, graduate students will be expected to participate in in-depth weekly discussions of the scientific literature and to prepare a research grant proposal on a specific topic. Dual listed with ANSC 4120. *Prerequisite*: a course in systemic anatomy and physiology or consent of instructor. (Normally offered fall semester)

5150. Physiology of Ruminant Digestion. 3. The anatomical structure, function, and symbiotic relationship of the ruminant digestive system. Dual listed with ANSC 4150. *Prerequisite*: ANSC 3100. (Normally offered fall semester)

5180. SAS Applications in Agriculture. 2. Use of PC Statistical Analysis (SAS) software for analysis of data generated using experimental designs common to the agricultural sciences. Course will emphasize applied programming and interpretation of results. *Prerequisite*: STAT 5080 or equivalent.

5260. Mammalian Endocrinology. 3. Introduction to the principles of endocrinology. The role of endocrine systems in regulating metabolism, growth, reproduction, and lactation in mammals are discussed. Dual listed with ANSC 4260. *Prerequisite*: graduate standing. (Normally offered fall semester)

5510. Mineral Metabolism. 3. Lectures on current mineral nutrition topics with student reports on recent journal articles. *Prerequisite*: ANSC 3100.

5540. Principles of Animal Breeding. 3. Discusses genetic principles underlying animal improvement; introductory population genetics; heritability; systems of mating; and selection. Dual listed with ANSC 4540. (Normally offered fall semester)

5550. Investigations in Animal Nutrition. 2-3 (Max. 6). Special problems involving nutritional research with domestic or laboratory animals. *Prerequisite*: ANSC 3100 and consent of instructor.

5620. Wool Measurement Methods. 3. Theory and practice relating to routine and standard analytical fiber measurements. *Prerequisite*: ANSC 3040 and STAT 2050 or consent of instructor.

5680. Wool Problems Analysis. 1-5 (Max. 10). Scientific papers on assigned topics. *Prerequisite*: STAT 2050.

5770. Lipid Metabolism. 3. An in-depth study of lipid metabolism and regulation of genes and enzymes involved in transport, synthesis, mobilization, and oxidation of lipids with application to ruminant and non-ruminant species as well as to humans. Cross listed with FDSC 5770. *Prerequisite*: ANSC 3100 or MOLB 3610 or FCSC 4145.

5780. Investigations in Animal Breeding. 1-3 (Max. 6). Assigned problems involving genetic and physiological research with domestic or laboratory animals. *Prerequisite*: ANSC 4550.

5865. Advanced Seminar in Nutrition. 1-2 (Max. 2). Preparation and presentation of seminars on a variety of topics relating to animal nutrition, metabolism, and livestock production. *Prerequisites*: graduate standing.

5870. Reproductive Biology Seminar. 1 (Max. 12). A graduate seminar designed to examine a variety of topics relating to the physiological processes of reproduction in mammals. *Prerequisite*: graduate standing.

5880. Advanced Topics. 1-3 (Max. 6). Special topics will be offered based on interest of students and faculty. Credit hours are variable 1-3 and are repeatable. *Prerequisite*: graduate standing.

5890. Advanced Seminar. 1-2 (Max. 6). Preparation, presentation, and discussion of assigned reports. Invitational lectures by visiting guests.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite*: graduate status.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite*: advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite*: advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: Credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites*: enrolled in a graduate degree program.

5961. Graduate Project. 1-4 (Max. 4). Limited to those students enrolled in a Plan B graduate program. Students should be involved in non-course scholarly activities in support of the Plan B project. *Prerequisites*: must be enrolled in Plan B program and have departmental approval.

5980. Dissertation Research. 1-12 (Max. 48). Graduate level course designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite*: enrollment in a graduate level degree program.

5990. Internship. 1-12 (Max. 24). *Prerequisite*: graduate standing.

Food Science

Food science is the application of basic sciences to the processing, quality control, storage, distribution and consumer use of food products. The microbiological, chemical and physical characteristics of foods as related to food processing and product quality are studied. Major emphasis is placed in the area of animal food products.

Food Science and Human Nutrition

Degree Offered

M.S. in Food Science and Human Nutrition

The interdisciplinary food science and human nutrition master's degree program, jointly sponsored by the departments of Animal Science and Family and Consumer Sciences, affords students the opportunity to pursue graduate work in the areas of human nutrition and/or food science. Prior to admission to the program, students will select the major department (Animal Science or Family and Consumer Sciences) that best suits their desired research area(s). Students choosing the interdisciplinary program in food science and human nutrition will gain expertise in theory as well as research in some combination of the areas of human nutrition and metabolism, food product development, and community nutrition, food microbiology, meat science and food chemistry. All students will be exposed to laboratory as well as classroom learning experiences.

Program Specific Admission Requirements

Recommended prerequisites for students entering the program:

- One semester of organic chemistry (may include laboratory)
- Human or animal nutrition, anatomy and physiology
- Introductory statistics

Admission requirements include:

- A bachelor's degree based on a four-year curriculum from an institution accredited by one of the regional associations of the Commission on Institution of Higher Education or equivalent.
- A grade point average of 3.000 or higher in the previous degree.
- A Graduate Record Exam (GRE) score. The GRE is considered in the admissions process, with a required minimum score of 150 on the Verbal section and 141 on the Quantitative section.

- For international students whose native language is not English, a minimum TOEFL score of 76 or an official IELTS score of 6.5.
- International students must also provide evidence of adequate financial resources.

For more information please visit UW's graduate admissions website <https://www.uwyo.edu/admissions/graduate/>.

Application packets for fall entry are due no later than March 1. Applications may be considered throughout the year if space in a program area is available.

To apply please complete the online application at the UW Office of Admissions application website <http://www.uwyo.edu/admissions/apply.html> and submit the following:

- Transcripts from all institutions attended
- Official GRE scores
- Names and contact information for at least 3 people who will provide letters of recommendation about the applicant's preparedness and/or qualifications for the desired graduate degree program
- A statement of intent that includes: research interests, future goals related to the program of interest, why the applicant is seeking this degree, prior work related experience.
- A brief resume or curriculum vitae
- International applicants must provide: official TOEFL or IELTS scores and evidence of adequate financial resources.

For more information, please contact the Department of Family and Consumer Sciences at 307-766-4145 or fam-consci@uwyo.edu, or the Department of Animal Science at 307-766-2224 or animalscience@uwyo.edu.

Program Specific Degree Requirements

One semester of biochemistry (may include laboratory)

Human or animal nutrition, anatomy and physiology

Statistics

A minimum of 30 credit hours is required for this degree. Students may be required to take more than the minimum number of credit hours, either because they have to satisfy prerequisites for some of their graduate-level courses, or because a student's committee determines that more than 30 hours will be need-

ed for the student to reach his/her professional objective. The student's program of study must include at least one credit hour of graduate-level seminar. A thesis is required. Students may request their area of thesis research be in food science or in human nutrition.

Students may use facilities such as the meat processing laboratory, sensory evaluation rooms, experimental kitchens, and a variety of modern facilities for research involving small animals and human subjects. Laboratory instruments including high performance liquid chromatographs, indirect calorimetry, electrophoresis equipment, densitometers, gas chromatographs, ultracentrifuges, scintillation counters, differential scanning calorimeters, and histological equipment are available.

See the Food Science (FDSC) and Family and Consumer Sciences (FCSC) section of this catalog for course listings.

Food Science (FDSC)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1101. First-Year Seminar. 3. [(none)▶FYS]

1410. Food and Our Well Being. 3. Introductory course dealing with current questions and concerns about foods. Considers food composition, effects of food processing, food labeling, diet, degenerate diseases and general health. Students become familiar with foods and food industry. (Normally offered fall semester)

2040. Principles of Meat Animal Evaluation. 3. Live animal and carcass evaluation of beef, sheep and swine. Slaughter, meat inspection and anatomy are discussed. (Normally offered spring semester)

3060. Principles of Meat Science and Muscle Biology. 3. Principles of muscle, adipose, and connective tissue growth, structure and metabolism; conversion of muscle into meat; fresh meat properties and quality; chemical properties of meat; meat microbiology, preservation and storage; meat by-products; HACCP. *Prerequisites:* CHEM 1000 and LIFE 1010. (Normally offered fall semester)

3061. Livestock Slaughter Practicum. 1. Students learn and practice proper techniques of livestock slaughter. *Prerequisite:* 4 credits of biological sciences. (Normally offered fall semester)

3062. Carcass Fabrication. 2. Principles of carcass fabrication; Institutional Meat Purchase Specifications and North American

Meat Processors nomenclature and fabrication procedures. *Prerequisite:* 4 credits of biological sciences. (Normally offered spring semester)

3063. Meat Processing. 2. Principles of applicable meat protein chemistry, heat transfer and other processing parameters applicable to production of sausage, cured meat, and other processed products. A variety of processed meat products will be manufactured in lab. *Prerequisite:* FDSC 3060 or concurrent registration. (Normally offered spring semester)

3545. Introduction to Meat Judging. 3. USDA grading standards, value pricing, yield and quality attributes of meat are used to evaluate products. Improve communication skills and terminology through oral and written reasons. Requires field trips. *Prerequisite:* FDSC 2040. (Normally offered fall semester)

3550 [2100]. Advanced Meat Judging. 1-2 (Max. 3). Students representing the university in national and regional contests are selected from this course. Requires field trips. *Prerequisite:* FDSC 3545.

3720 [4720]. Applied Food Chemistry. 3. Study of chemistry and composition of nutrients in raw and processed foods. *Prerequisite:* CHEM 2300 or ANSC 2010. (Normally offered spring semester)

4090. Food Microbiology. 3. Discusses microorganisms and theory of their growth and survival in relation to spoilage and preservation of foods and health hazards in foods. Dual listed with FDSC 5090; cross listed with MICR 4090. *Prerequisite:* MOLB 2210. (Normally offered spring semester)

4100 [610]. Laboratory Techniques in Food Microbiology. 1. Lab techniques used in food microbiology. Dual listed with FDSC 5100; cross listed with MICR 4100. *Prerequisite:* FDSC 4090 or 5090, taken concurrently. (Normally offered spring semester)

4800. Problems in Food Science. 1-3 (Max. 6). Examines special problems related to quality control, formulation and processing of meat, poultry and dairy foods. Offers research techniques and instrumentation in foods. *Prerequisites:* 6 hours in FDSC, 6 hours in chemistry and consent of instructor.

4900. Food Safety. 3. Issue-oriented lecture/discussion course. Includes topics such as what is safe food, what makes food unsafe and how safety of a food is determined. Presents laws and regulations on food safety. In addition to a text, area experts are invited to discuss important issues. *Prerequisite:* 6 hours of biological science. (Offered fall semester of odd-numbered years)

4990. Undergraduate Teaching Practicum. 1-2 (Max. 4). Participation of undergraduates in the teaching of FDSC courses under the supervision of faculty/staff. Offered Satisfactory/Unsatisfactory only. *Prerequisite:* junior standing or consent of instructor.

5090. Food Microbiology. 3. Discusses microorganisms and theory of their growth and survival in relation to spoilage and preservation of foods and health hazards in foods. Dual listed with FDSC 4090. *Prerequisite:* MOLB 2210. (Normally offered spring semester)

5100. Food Microbiology Laboratory. 1. Laboratory techniques used in food microbiology. Dual listed with FDSC 4100. *Prerequisite:* FDSC 4090 or 5090, taken concurrently. (Normally offered spring semester)

5880. Advanced Problems and Topics. 1-3 (Max 6). Designed to allow graduate students to pursue advanced research problems and advanced topics and to obtain experience in the teaching process. *Prerequisite:* graduate standing and consent of instructor.

5890. Seminar in Food Science and Nutrition. 1. A seminar course on topics in food science and human nutrition. Dual listed with FDSC 4890. *Prerequisite:* graduate standing.

5900. Practicum in College Teaching. 1-3 (Max 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may NOT be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5980. Dissertation Research. 1-12 (Max. 48). Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisites:* enrolled in a graduate degree program.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

The Department of Veterinary Sciences section, including Pathobiology course offerings begins on page 140.

Department of Ecosystem Science and Management

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Department Head: Scott N. Miller

Professors:

JEFFREY L. BECK, B.S. Brigham Young University 1993; M.S. 1996; Ph.D. University of Idaho 2003; Professor of Rangeland Ecology and Watershed Management 2019, 2007.

THIJS KELLENNERS, B.S. Wageningen University, The Netherlands 1988; M.S. 1993; Ph.D. 2001. Professor of Soil Science 2019, 2012.

SCOTT N. MILLER, B.S. Brown University 1991; M.S. University of Arizona 1995; Ph.D. 2002; Professor of Rangeland Ecology and Watershed Management 2017, 2002.

JAY B. NORTON, B.S. University of Montana 1985; M.S. Iowa State University 1996; Ph.D. University of Montana 2000; Professor of Soil Science 2019, 2012.

VIRGINIA B. PAIGE, B.A. Colorado College 1984; M.S. University of Massachusetts 1992; Ph.D. University of Arizona 2000; Professor Rangeland Ecology and Watershed Management 2019, 2004.

SCOTT R. SHAW, B.S. Michigan State University 1977; M.S. University of Maryland 1981; Ph.D. 1984; Professor of Entomology 1998, 1989.

PETER D. STAHL, B.S. Oklahoma State University 1978; M.S. University of Wyoming 1982; Ph.D. 1989; Professor of Restoration Ecology 2009, 2000; Director, Wyoming Reclamation and Restoration Center.

DAVID G. WILLIAMS, B.A. University of Texas 1985; M.S. Texas A&M University 1988; Ph.D. Washington State University 1992; Professor of Rangeland Ecology and Watershed Management 2009, 2002.

Associate Professors:

TIMOTHY R. COLLIER, B.S. University of California—Riverside 1987; Ph.D. University of California—Santa Barbara 1994; Associate Professor of Entomology 2008, 2002.

KRISTINA HUFFORD, B.A. University of California-Berkeley 1993; Ph.D. University of Georgia 2001; Associate Professor of Rangeland Ecology and Watershed Management 2017, 2010.

MELANIE MURPHY, B.S. University of Idaho 1998; M.S. 2001; Ph.D. Washington State University 2008; Associate Professor of Rangeland Ecology and Watershed Management 2017, 2010.

MENGQIANG ZHU, B.E. North China Electric Power University 2002; M.S. Chinese Academy of Sciences 2005; Ph.D. University of Delaware 2010; Associate Professor of Soil and Environmental Biogeochemistry 2019, 2013.

Assistant Professors:

DAVID CHRISTIANSON, B.S. Montana State University 2003; Ph.D. 2008; Assistant Professor of Rangeland Ecology and Watershed Management 2019.

FABIAN NIPPGEN, M.S. Albert-Ludwigs University 2007; Ph.D. Montana State University 2014; Assistant Professor of Rangeland Ecology and Watershed Management 2017.

J. DEREK SCASTA, B.S. Texas A&M University 2004; M.S. 2008; Ph.D. Oklahoma State University 2014; Assistant Professor of Rangeland Ecology and Watershed Management 2014.

LINDA VAN DIEPEN, B.S. Hogeschool IJsselland, Deventer 1999; M.S. Wageningen University 2002; Ph.D. Michigan Technological University 2008; Assistant Professor of Soil Microbiology 2015.

KAREN L. VAUGHAN, B.S. University of Delaware-Newark 2001; M.S. University of Maryland-College Park 2004; Ph.D. University of Idaho-Moscow 2008; Assistant Professor of Pedology 2015.

KEVIN WILCOX, B.S. Central Washington University 2008; Ph.D. Colorado State University 2015; Assistant Professor of Rangeland Ecology and Watershed Management 2018.

Academic Professionals:

CRAIG COOK, B.S. University of Utah 1978; Research Scientist, Stable Isotope Facility Manager.

SCOTT SCHELL, B.S. University of Wyoming 1991; M.S. 1994; Senior Extension Entomologist 2005, Associate Research Scientist 2009.

Adjunct Professors:

Justin Derner, Jack Morgan, Brenda Schladweiler, Gerald Schuman, Nancy Shaw, Ramesh Sivanpillai

Professors Emeriti:

Ann Hild, Alexandre Latchininsky, William Laycock, David Legg, Larry Munn, Richard Olson, Katta Reddy, J. Daniel Rodgers, Quentin Skinner, Michael Smith, John A. Tanaka, George Vance, James Waggoner, James Wangberg, Thomas Wesche, Stephen Williams

The Department of Ecosystem Science and Management offers two programs leading to a Bachelor of Science degree. These are Rangeland Ecology and Watershed Management and Agroecology (an interdepartmental program offered through the Department of Ecosystem Science and Management and the Department of Plant Sciences). The coursework requirements necessary for obtaining an agroecology degree are described in the Department of Plant Sciences section of this publication. Either degree can also be obtained as an affiliate degree in conjunction with the School of Environment and Natural Resources. Six minor degree programs are offered through the department: Insect Biology, Rangeland Ecology and Watershed Management, Soil Science, Agroecology, Forest Resources, and Reclamation and Restoration Ecology. Obtaining a minor to complement a B.S. major degree program provides credentials and knowledge that can expand career opportunities.

The degree programs reflect the department's diverse expertise in natural resource and agriculture sciences. Students completing degrees offered through the department are well prepared for careers in natural resource management and sustainable agriculture (e.g., range management, watershed management, restoration ecology/reclamation of degraded land, wildlife habitat management, biocontrol/integrated pest management, soil science and various types of environmental consulting) or other science careers.

Student Learning Outcomes

The goal of the Department of Ecosystem Science and Management is to provide students with a comprehensive knowledge in several different areas in addition to their specific area of study. These expectations ensure that students may take these learned skills and successfully apply them in their post-graduate endeavors. Assessments in all areas are based on knowledge, skills, and attitude.

These areas include:

Oral communication encompasses all the abilities necessary for effective expression and sharing of information, ideas, and feelings in a format including verbal and nonverbal symbols.

Proficiency in written communication will ensure that students will be able to write for different audiences, from expressive writing to technical writing, using a range of sophistication in language.

Professional behavior involves attaining high standards of behavior and appropriate attitudes, not only through acquiring knowledge and experience, but a lifelong commitment to learning and achievement.

Competency in critical thinking and problem solving will enable students to engage in reasonable, reflective thinking focused on deciding what to believe or do.

Computer and information literacy ensures that students will be viewed as trainable and adaptable in a computerized work environment. Proficiency in this area also enables students to effectively access online information, and skillfully make use of it.

The results in these different areas will aid the department in:

- Planning instructional strategies to address student strengths and weaknesses;
- Evaluating and describing overall student achievement;
- Counseling students for academic and career options; and
- Evaluating the effectiveness of instructional programs.

Minor in Forest Resources

The primary goal of the Forest Resources minor degree program is to develop a working knowledge of the processes that influence provision of the key products derived from forest lands. Courses taken in fulfillment of a major degree program will also be able to be applied to a minor degree program.

	Hrs.
Minimum Requirements	20
RNEW 2100, SOIL 4150, RNEW 4775, and REWM 4540. Choose one from REWM 3100, REWM 4285, REWM 4700, or GEOG 4420; choose one from GEOG 2550 or REWM 4103; choose one from REWM 2000, ZOO 2450, RNEW 3000, or GEOG 4470.	

Minor in Reclamation and Restoration Ecology

This program covers the use of basic and applied ecological concepts to rehabilitate and restore processes and functions to disturbed ecosystems.

	Hrs.
Required Courses	14
LIFE 3400, SOIL 2010, REWM 4200, 4580, RNEW 4990	
Planning and Policy (choose one).....	3
AGEC 4710, ENR 3000, GEOG 4040, 4750, REWM 4051, 4052, 4900	
Below-Ground Processes (choose one)	3-4
CE 4800, 4820, SOIL 4100, 4120, 4140, 4150, 4160	
Above-Ground Processes (choose one)	2-4
BOT 4700, 4111, ENTO 4678, 4685, GEOG 4200, REWM 4285, 4540, 4700, 4710, 4850, ZOO 4550	
Total	22-25

Graduate Study

The Department of Ecosystem Science and Management is an interdisciplinary department made up of five disciplinary areas: entomology, rangeland ecology, soil sciences, agroecology, and watershed management. The department offers the master of science and doctor of philosophy degrees in entomology, rangeland ecology and watershed management, and soil science. A water resources dual major may be obtained in conjunction with each of these master's degrees. For the rangeland ecology and watershed management degrees, thesis and dissertation problems may be developed in aspects of range ecology, wildlife habitat, reclamation of disturbed lands, watershed management, utilization and improvement of rangelands, and many other facets of range and forest ecology management. For the entomology degrees, thesis and dissertation problems may be developed in many areas of basic and applied aspects of insect ecology. For the soil degrees, thesis and dissertation problems may be developed in many basic and applied aspects of soil science. The degree programs reflect the department's diverse expertise in natural resource and agriculture sciences. Students completing degrees offered through the department are well prepared for careers in natural resource management and sustainable agriculture (e.g., range management, watershed management, restoration ecology/reclamation of degraded land, wildlife

habitat management, biocontrol/integrated pest management, soil science and various types of environmental consulting) or other science careers.

A graduate certificate in reclamation and restoration ecology may be obtained after completion of a B.S. degree or in conjunction with an M.S. or Ph.D. degree.

At present, no program for graduate degrees in agroecology is offered; however, some courses at the graduate level are available. Responsibility for this program is shared with the Department of Plant Sciences.

Program Specific Admission Requirements

Admission is contingent upon a faculty member being willing to assume responsibility for working with the student as an adviser.

Applicants are encouraged to initiate correspondence with faculty who share similar research interests as part of the process of securing faculty advising commitment.

In special circumstances, and with the faculty adviser's support, a student may be admitted in a provisional status with continued enrollment dependent upon meeting performance requirements specified at the time of admission.

Program Specific Graduate Assistantship Information

Current graduate assistantship availability, subject of study, and remuneration can be determined by checking: www.uwyo.edu/esm. Prospective students are also encouraged to directly correspond about future opportunities for graduate assistantships with faculty that share similar research interests.

Program Specific Degree Requirements

Master of Science in Entomology

Plan A (thesis)

The master of science degree normally is offered under Plan A which requires at least the university minimum degree requirements and an oral examination.

Plan B (non-thesis)

Requires 30 hours of graduate credit to include 9 hours of required courses, 11 hours of required electives, and 10 hours of other electives.

Plan B project - follows format of Plan A thesis.

A Plan B master of science will be a terminal degree program in the Department of Ecosystem Science and Management. Students completing this option will not qualify for a subsequent Ph.D. program in Department of Ecosystem Science and Management at the University of Wyoming.

Master of Science in Entomology/Water Resources

Please refer to the Water Resources section of this Catalog for degree requirements.

Master of Science in Rangeland Ecology and Watershed Management

Plan A (thesis)

The master of science degree normally is offered under Plan A which requires at least the university minimum degree requirements and an oral examination.

An oral defense of the thesis is required.

Plan B (non-thesis)

Plan B is available under special circumstances and requires 30 hours of graduate coursework.

Plan B candidates must also prepare one professional paper (i.e., content and form compatible with publication in a scientific journal) or, if the adviser requests, two professional papers in selected topic areas.

An oral defense of the paper(s) is required.

Master of Science in Rangeland Ecology and Watershed Management/Water Resources

Please refer to Water Resources section of this Catalog for degree requirements.

Master of Science in Soil Science

Plan A (thesis)

Plan A requires the university minimum degree requirements and an oral final examination.

Plan B (non-thesis)

Plan B is available and requires 30 hours of graduate coursework.

An oral defense of the paper(s) is required.

Master of Science in Soil Science/Water Resources

Please refer to the Water Resources section of this Catalog for degree requirements.

Doctoral Programs

Doctor of Philosophy in Entomology

Candidates must complete the minimum requirements for the doctor of philosophy degree, plus a preliminary examination (written and oral) covering knowledge related to the discipline (taken after most coursework complete) and an oral final examination.

Doctor of Philosophy Program in Hydrology

Water Resources/Environmental Science and Engineering (WRESE) is an Interdisciplinary Ph.D. program that fulfills an important need by organizing a rigorous Ph.D.-level curriculum, with sufficient numbers of relevant, frequently-offered courses to serve the needs of Ph.D. students affiliated with program faculty.

The program's Ph.D.-level coursework is essential and forward-looking in areas such as aquatic chemistry, transport in natural systems, hydrometeorology, land-atmosphere interactions, eco-hydrology, hydrogeology, vadose zone hydrology, hydrologic applications of stable isotopes, limnology, hydrologic modeling, hydrological and water quality effects on aquatic organisms, hydroclimatology, hydrologic remote sensing and watershed hydrology.

Doctor of Philosophy in Rangeland Ecology and Watershed Management

Candidates must complete the minimum requirements for the doctor of philosophy degree, plus a preliminary examination (written and oral) covering knowledge related to the discipline (taken after most coursework complete) and an oral final examination.

Doctor of Philosophy in Soil Science

Candidates must complete the minimum requirements for the doctor of philosophy degree, plus a preliminary examination (written and oral) covering knowledge related to the discipline (taken after most coursework complete) and an oral final examination.

Doctor of Philosophy in Ecosystem Science and Management/Applied Economics

The course requirements for the PhD program in Ecosystem Science and Management (ESM) with a concentration in Applied Economics are highly flexible to accommodate a wide variety of student backgrounds and interests. Students can major in any PhD program within ESM including Rangeland Ecology and Watershed Management (REWM), Soil Science (SOIL), and Entomology (ENTO) following the ESM admission procedures. The

student's graduate committee, with the approval of the Department Heads and College Dean, determine the final program of study. Acknowledging flexibility, each student's program of study is expected to meet the following minimum requirements:

A minimum of 72 credit hours of coursework. The credit hour requirement can include:

Up to 48 credit hours transferred from approved graduate courses earned while pursuing an M.S. degree (no more than 4 credit hours of thesis);

A minimum of 12 credit hours of approved ESM (REWM, SOIL, ENTO) courses;

A minimum of 18 credit hours of approved AGECE or ECON courses, with at least 12 credit hours at the 5000-level.

At least 42 of the 72 credit hour requirement must be earned in formal coursework.

No more than 12 credit hours of 4000-level courses can count towards the 72 credit hour requirement.

In addition to the degree requirements listed, students pursuing this option will also meet the following general requirements:

Enroll in, and complete, the graduate minor in Applied Economics.

Include co-chairs, one from ESM and one from AGECE, on the graduate committee.

Participate in a meaningful teaching experience to be coordinated by the student's major professor.

Complete a preliminary examination covering knowledge related to both ESM and AGECE.

Present research results at a formal public seminar.

Complete a final oral examination covering the student's thesis research administered by the graduate committee.

Graduate Certificate Program

Reclamation/Restoration Ecology Graduate Certificate

The Reclamation/Restoration Ecology (RRE) graduate certificate prepares the student to use basic and applied ecological concepts to reclaim and/or restore processes and functions to disturbed ecosystems. Reclamation and/or restoration of disturbed ecosystems requires an understanding of the edaphic, biotic, hydrologic, geologic, and topographic factors comprising these ecosystems, including the complex interrelationships that support and

perpetuate ecosystem function. The graduate certificate will be granted to students who have completed a B.S. in an appropriate science-oriented discipline or are currently enrolled in an M.S. or Ph.D. program.

The graduate certificate will also be available to professionals working in reclamation/restoration oriented fields seeking to upgrade their training in reclamation and restoration ecology. Those interested in the graduate certificate will be required to complete the course work listed below as well as write a synopsis paper with a formal presentation advertised as an open forum seminar.

Required Certificate Courses:

Reclamation and restoration ecology courses
 REWM 4200, REWM 5580 6 hours
 Reclamation problems
 SOIL 5565 or REWM 5640..... 4 hours
 Reclamation process course (choose one)
 BOT 5700, BOT 5730, BOT 5780, PLNT
 5070, PLNT 5470, GEOL 5444, GEOL
 5570, REWM 5280, REWM 5710, RNEW
 5540, SOIL 5100, SOIL/MATH 5110,
 SOIL 5120, SOIL 5130, SOIL 5140, SOIL
 5150, ZOO 5550 3 hours
 Planning/policy courses (choose one)
 ENR 4900, ENR 5900 3 hours
 Minimum total credits needed: 16 hours

Courses of instruction in the department are offered in agroecology, entomology, rangeland ecology and watershed management, renewable resources, and soil science.

Ecosystem Science and Management (ESM)

4990. Topics. 1-4 (Max 8). Topics pertaining to ecosystem science and natural resource management. Intended to accommodate instruction in various specialized subjects being offered for the first time or not offered on a regular basis. Students may enroll in more than one section of this course provided topics are different. *Prerequisites:* Appropriate to the particular topic will be specified in the course advertisement.

5995. Topics. 1-4 (Max 8). Topics pertaining to ecosystem science and natural resource management. Intended to accommodate instruction in various specialized subjects being offered for the first time or not offered on a regular basis. Students may enroll in more than one section of this course provided topics are different. *Prerequisites:* Appropriate to the particular topic will be specified in the course advertisement.

Renewable Resources (RNEW)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦PN]).

1000. Wyoming Wildlands: Science and Stewardship. 3. [(none)♦PN] Introduces students to the breadth of Wyoming natural resources and ecosystems. In this class we investigate the science and management of the Wyoming landscape. Students are introduced to the rangelands, wildlife, forests, watersheds, and disturbed lands of Wyoming with an emphasis on understanding the ecology and natural history of the region. Throughout the course, students are exposed to how the extensive ecosystems of the West are managed by public and private groups and how human decisions change the landscape.

2100 [BOT 2100]. Forest Management. 3. Principles of forest management. Topics include the laws affecting forest management, methods of harvesting wood from forests, fire and insect management, the effects of disturbances on stream flow and nutrient cycling, and the challenges of developing management plans for forests. Cross listed with ENR 2100. *Prerequisites:* LIFE 1001 or 1010.

2345. Natural Resource Ethics. 3. [CH,D♦(none)] Introduction to ethics in context of natural resource extraction, use, conservation, preservation, and distribution. Ethical frameworks include teleological and deontological theories primarily applied to human needs and wants. Concepts and applications of environmental justice are addressed, including private property, sustainability, and obligations to future generations. Cross listed with ENR/PHIL 2340.

3000. Tropical Ecology. 3. Examines the characteristics of tropical ecosystems, how they evolved, their value to humans, their present status, and current issues relating to biodiversity, deforestation, extinction, and conservation. *Prerequisites:* LIFE 1001 or 1010.

4130. Applied Remote Sensing for Agricultural Management. 3. Covers remote sensing concepts and applications related to croplands, rangelands, forests, and water. Students learn techniques for monitoring plant growth and vigor, monitoring rangelands, distinguishing invasive species, categorizing forest fires, and mapping water bodies. Students integrate remotely sensed data with other geospatial data. Cross listed with AECL/GIST 4130. *Prerequisites:* QA course and 9 credit hours in student's major field and junior/senior standing or permission of instructor.

4400. Invasive Plant Ecology. 3. Ecological impacts of invasive, non-indigenous plant species, the ecological, genetic and evolutionary hypotheses for invasiveness, as well as management strategies for invasive plant species. Dual listed with RNEW 5400; cross listed with AECL 4400. *Prerequisite:* LIFE 3400.

4730. Plant Physiological Ecology. 4. Acquaints advanced students with environmental factors which affect the establishment and growth of plants. Emphasizes adaptive mechanisms. Dual listed with RNEW 5730. Cross listed with BOT 4730. *Prerequisites:* one course in physiology and one course in ecology. (Normally offered spring semester)

4775. Forest Ecology. 4. Integrative study of the structure, function, and ecological diversity of forested ecosystems, and the physical factors that influence this diversity, including emergent properties of energy flow and nutrient cycling. Special emphasis is given to understanding forest disturbances and succession, and implications for impacts of management and sustainability are discussed throughout. Cross listed with BOT 4775. *Prerequisite:* LIFE 3400.

4800. Undergraduate Research. 1-3 (Max. 18). Undergraduate student research can be an important component in the intellectual and professional development of future scientists and land managers. Undergraduate students working with a faculty member in a research capacity can register for up to 3 credit hours per semester. The student and faculty member will identify an academic outcome that is associated with their research effort, such as a research paper, oral presentation, or poster session at an appropriate venue. Instructor's permission required.

4990. Topics in:_____ 1-4 (Max. 8). Special topics pertaining to renewable natural resource management. Intended to accommodate instruction in various specialized subjects not offered on a regular basis. Students may enroll in more than one section of this course provided topics are different. Dual listed with RNEW 5990. *Prerequisite:* consent of the instructor to pursue study of the topic.

5200. Spatial Analysis of Watersheds and Ecosystems. 3. Covers topics related to analysis of spatial and temporal processes at watershed and ecosystem scales using Geographic Information Systems (GIS). Topics include land classification and suitability analysis interpolation techniques, terrain analysis, model integration, and visualization. Sources of potential error and ramifications are examined. *Prerequisite:* GEOG 4210 or equivalent.

5400. Invasive Plant Ecology. 3. Ecological impacts of invasive, non-indigenous plant species, the ecological, genetic and evolutionary hypotheses for invasiveness as well as management strategies for invasive plant species. Dual listed with RNEW 4400; cross listed with AECL 5400. *Prerequisite:* LIFE 3400.

5500. Stable Isotope Ecology. 3. Application of stable isotope measurements to organismal and systems ecology. Lectures address the theory underlying the use of stable isotopes at natural abundance levels as tracers and integrators of important physiological and ecological processes. Laboratory exercises provide hands on experience with stable isotope ratio measurements. *Prerequisite:* graduate classification in a natural science or agriculture discipline.

5540. Shrubland Ecology. 3. Ecology of shrub-dominated lands and shrub species in grasslands. Location, importance and environmental constraints of shrub distributions. Topics include herbivory, woody plant invasions, competitive interactions, monitoring and population dynamics. Emphasizes familiarity with scientific literature. *Prerequisite:* RNEW 3000, BOT 4700.

5545. Shrub Ecology Trip. 2. Field study in North American shrublands of western US ecosystems. Participants learn from researchers, managers, field activities, required readings and written assignments. Participants will be camping and a fee is required. *Prerequisite:* RNEW 5540.

5730. Plant Physiological Ecology. 4. Acquaints advanced students with environmental factors which affect the establishment and growth of plants. Emphasizes adaptive mechanisms. Lecture with inclusive hands-on laboratory. Dual listed with RNEW 4730; cross listed with BOT 4730/5730. *Prerequisite:* one course in physiology and one course in ecology.

5990. Topics In Renewable Resources. 1-4 (Max. 8). Special topics pertaining to renewable natural resource management. Intended to accommodate instruction in various specialized subjects not offered on a regular basis. Students may enroll in more than one section of this course provided topics are different. Dual listed with RNEW 4990.

Environment and Natural Resources Affiliate Degrees

Bachelor of Science degrees in either the Agroecology or the Rangeland Ecology and Watershed Management offered through the Ecosystem Science and Management Department may also be obtained as affiliate degrees with the School of Environment and Natural Resources (i.e., the degree titles would be En-

vironment and Natural Resources/Rangeland Ecology and Watershed Management or Environment and Natural Resources/Agroecology). The additional coursework requirements necessary for obtaining an affiliate degree are described in the School of Environment and Natural Resources section of this publication.

Entomology Minors Programs

Because of the pervasiveness of insects, the entomology minors programs provide a vital link among the life and environmental sciences at the University of Wyoming. Students will be prepared to serve society not just through the vital industry of agriculture, but through contributions to basic biology, human and animal health, ecosystem management, wild-life conservation and a myriad of other ways.

Minor in Insect Biology

This minor is intended for students who have an interest in insects as organisms, including their basic biology, ecology and evolution. As insects dominate biological diversity, they are essential to most ecological systems, and have unique physiological systems. Students majoring in zoology, botany, molecular biology, biology or similar fields will find the study of these organisms a rewarding and valuable (if not essential) element of the life sciences.

In terms of biological diversity, at least 75 percent of all species are insects, with over 800,000 known species and another 10-50 million yet to be described. Insects are increasingly used as bioindicators of environmental health. Many industries now recognize that insects may be the world's richest, untapped natural resource, with billions of dollars of unexploited goods and services. Accessing these resources requires trained entomologists. Such training demands an academic setting, such as the University of Wyoming, where collections are maintained, productive faculty are involved in quality research and teaching, the latest methodologies are available and taught, the necessary scientific literature is readily accessible and a curriculum available that allows the student to pursue this field.

Minimum requirements.....13

Choose one from ENTO 1000 or 1001, then choose from ENTO 4678, 4682, 4684, 4686, 4687, and 4884 to meet the minimum 13 credit hour requirement.

Insect Biology/Entomology Graduate Study

The department offers graduate work leading to the Master of Science and Doctor of Philosophy in entomology and an affiliated graduate option in water resources. Department faculty have active programs in insect ecology (biological control, population biology and plant-insect interactions), systematics (taxonomy, phylogeny and evolution) and pest management (biological control, biometrics and sampling, and pest management on humans, livestock, crops and rangeland).

Entomology (ENTO)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

1000. Insect Biology. 3. [SB♦PN] Introduces insects and related arthropods. Introduces aspects of insect biology, behavior, life history and diversity, as well as many ways that insects affect humans.

1001. Insect Biology. 4. [SB♦PN] Covers same lecture material as ENTO 1000, but includes a laboratory.

1150. Pesticide Safety and Application. 1. Introduces various types and safe methods of pesticides application. Subsequent to completion, students may take the certification test administered by the Wyoming Department of Agriculture. Cross listed with CROP 1150. Offered S/U only. (Normally offered the week prior to spring semester)

4300. Insect Ecology. 3. Examines concepts of insect ecology and their application to the management of agricultural and rangeland insect pests. Control of rangeland weeds using insects is also examined. Covers population dynamics, predator-prey and insect-plant interactions, biological control and integrated pest management. *Prerequisite:* ENTO 1000 or LIFE 1003 or LIFE 1020 or consent of instructor.

4678. Aquatic Entomology. 3. Emphasizes biology, ecology, distribution, and taxonomy of aquatic insects. Includes aquatic insects as indicators of pollution. Students must make and identify a collection of immature aquatic insects. Dual listed with ENTO 5678. *Prerequisite:* ENTO 1000, 1001. (Normally offered fall semester of even-numbered years)

4682. Insect Anatomy and Physiology. 5. Studies structure and function of the insect body, particularly emphasizing the relationship between anatomical features and their cellular/biochemical functions. Dual listed with ENTO 5682. *Prerequisite:* ENTO 1000. (Normally offered spring semester of even-numbered years)

4684. Classification of Insects. 4. Studies insect orders, families and taxonomic treatises. Requires collection of adult insects representing 100 families, or equivalent museum project, for completion of course requirements. Dual listed with ENTO 5684. *Prerequisite:* ENTO 1000. (Normally offered fall semester of odd-numbered years)

4686. Problems in Entomology. 1-3 (Max. 6). Individual library, laboratory or field study of insects. *Prerequisites:* 4 hours of biological science and 3 hours of entomology.

4687. Insect Evolution. 3. Examines major events of insect evolution including origins, fossils, wings and flight, metamorphosis, extinct orders, diversification patterns of modern orders, climate change, plate tectonics, coevolution with plants, parasitism, social behavior, and origin of modern faunas. Dual listed with ENTO 5687. *Prerequisite:* ENTO 4684 required; ENTO 4670, 4682 recommended.

4884. Insect Behavior. 3. Examines the behavior of insects, including foraging, mating and social behavior. The course focuses on the applied as well as the fundamental aspects of behaviors, and both the strategic and physiological bases of behavior. Dual listed with ENTO 5884. *Prerequisite:* ENTO 1000.

5080. Statistical Methods for the Agricultural and Natural Resource Sciences. 3. Brief review of statistical principles. Use of SAS programming. Numerous analysis of variance techniques along with commonly used experimental designs. Multiple mean comparisons, linear contrasts, power of F test, simple linear regression, polynomial regression, analysis of covariance, and some categorical data techniques for student in the agriculture and natural resources sciences. Credit cannot be earned in more than one of the following courses: STAT 2100, 3050, 5050, 5060, 5070, 5080. Cross listed with STAT 5080. *Prerequisite:* STAT 2050 or equivalent.

5300. Applied Insect Ecology. 3. Examines concepts of insect ecology and their application to the management of agricultural and rangeland insect pests. Control of rangeland weeds using insects is also examined. Covers population dynamics, predator-prey and insect-plant interactions, biological control and integrated pest management. Dual listed with ENTO 4300. *Prerequisite:* ENTO 1000 or 9 hours of biology or ecology related coursework.

5601. Insects for Teachers: Collection and Identification of Insects. 1. Designed for school teachers K-12. Basic concepts such as insect classification, insect habitats, insect metamorphosis, and destructive and beneficial insects are discussed with emphasis on the presentation of these concepts in the school

classroom. Half of the class is devoted to field trips, laboratories, workshop activities, and films. Each student will make an insect collection, and learn how to preserve, mount, and identify specimens to order level. Course may be taken independently of ENTO 5602. Identical to NASC 4790. *Prerequisite:* junior standing. Offered summer term only.

5602. Insects in the Classroom: Insects and Their Ways. 1. Designed for school teachers K-12. Basic concepts of insect structure and function (insect morphology, insect physiology, insect ecology, and insect behavior) are discussed with emphasis on the presentation of these concepts using living insects in the classroom. Half of the class is devoted to field trips, laboratories, workshop activities, and films. Each student will design, conduct, and write-up an experiment with insects. Course may be taken independently of ENTO 5601. Identical to NASC 4790. *Prerequisite:* junior standing. Offered summer term.

5678. Aquatic Entomology. 3. Biology, ecology, distribution and taxonomy of aquatic insects will be emphasized. Additional material covered will include aquatic insects as indicators of pollution. Students must make and identify a collection of immature aquatic insects. Dual listed with ENTO 4678. *Prerequisite:* 1 year of basic biology.

5682. Insect Physiology. 5. Structure and function of the insect body, with particular emphasis on the relationship between anatomical features and their cellular/biochemical functions. Dual listed with ENTO 4682. *Prerequisite:* ENTO 1000.

5684. Classification of Insects. 4. A study of insect orders, families and taxonomic treatises. Collection of adult insects representing 100 families, or equivalent museum project, is required for completion of course requirements. Dual listed with ENTO 4684. *Prerequisite:* ENTO 1000; ENTO 4670 is recommended.

5686. Problems in Entomology. 1-3 (Max. 6). Individual library, laboratory or field study of insects. Dual listed with ENTO 4686. *Prerequisite:* 4 hours of biological science and 3 hours of entomology.

5687. Insect Evolution. 3. Examines major events of insect evolution including origins, fossils, wings and flight, metamorphosis, extinct orders, diversification patterns of modern orders, climate change, plate tectonics, coevolution with plants, parasitism, social behavior, and origin of modern faunas. Dual listed with ENTO 4687. *Prerequisite:* ENTO 4684/5684 required. Recommended: ENTO 4670/5670, ENTO 4682/5682.

5689. Topics in Entomology. 1-4 (Max. 6). Current topics in entomology taught by entomology faculty, adjunct faculty or visiting faculty. Please check class schedule for current title.

5850. Research in Entomology. 1-3 (Max. 8). Individual investigations of particular problems. *Prerequisite:* graduate standing

5852. Senior/Graduate Seminar. 1 (Max. 6). Discussion of important contributions to entomology. *Prerequisite:* graduate standing.

5884. Insect Behavior. 3. Fundamentals of insect behavior and an analysis of behavioral patterns. Dual listed with ENTO 4884. *Prerequisite:* one year of basic biology or equivalent; ENTO 5682 is recommended.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5980. Dissertation Research. 1-12 (Max. 48). Graduate level course designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate level degree program.

Agroecology Program

Rooms 50/2013 Agriculture Building

(307) 766-3103/766-2263

Departments of Plant Sciences and Ecosystem Science and Management

The Bachelor of Science degree program in agroecology is an interdepartmental major involving the collaborative teaching, advising and research expertise in the Departments of Plant Sciences and Ecosystem Science and Management. An agroecology minor is also available. See the Plant Sciences section under the College of Agriculture and Natural Resources for more information on the Agroecology program.

Rangeland Ecology and Watershed Management Major

Rangeland occupies 47% of the Earth's land area. The 50 million acres of rangeland in Wyoming provide diverse opportunities for the multiple uses of livestock and wildlife grazing, recreation, water production and natural beauty. Students are taught to understand and manage complex rangeland ecosystems.

The rangeland ecology and watershed management curriculum is designed for students choosing to study ecology, utilization and management of rangelands and wildland watersheds and related resources of forestry, recreation, wildlife management, soil science, botany, and zoology. Degrees include Bachelor of Science, Master of Science, and Doctor of Philosophy.

The undergraduate course of study helps students become well prepared for careers in natural resource management (e.g., range management, watershed management, restoration ecology/reclamation of degraded land, wildlife habitat management, ranch management, various types of environmental consulting), or other natural science careers. The curriculum fully meets the Office of Personnel Management (OPM) requirements for Range Conservationist. By appropriate course selection within the elective hours, students will also meet OPM requirements for additional professional work, such as soil conservationist or hydrologist.

Rangeland Ecology and Watershed Management Graduate Study

Areas of graduate study leading to a M.S. or Ph.D. in rangeland ecology and watershed management include range ecology, animal nutrition, watershed management, wildlife habitat management, restoration ecology, and reclamation of disturbed lands. A graduate certificate in reclamation and restoration ecology and a graduate option in water resources are offered in affiliation with the rangeland ecology and watershed management graduate degree.

Course Requirements for a Major in Rangeland Ecology and Watershed Management (B.S.)

	Hrs.
REWM	36
2000*, 2400*, 3000*, 3100*, 4100*, 4285*, 4330*, 4530*, 4700*, 4830*, 4850*, 4900*	

Resource management.....	14-15
SOIL 2010*, SOIL 4120*, AGECE 4700*, and choose one from RNEW 4130*, BOT 4111*, BOT 3150* or GEOG 4200*	
Physical and Natural World.....	8
LIFE 1010 and CHEM 1000	
Biological sciences.....	7
LIFE 2022* or 2023*, LIFE 3400*	
Communication skills.....	6
USP Communication 1 and COJO 2010	
Quantitative reasoning.....	7
MATH 1400, STAT 2050	
Human Culture.....	6
Human Culture, ECON 1020	
First-Year Seminar.....	3
US and WY Government.....	3
Electives.....	28-29
Total	123

*Course must be completed with a C or better.

Minor

A minor in rangeland ecology and watershed management is available for students in other majors interested in increasing their knowledge of the field. The number of hours required is 22. The required courses for the minor are: LIFE 1010 (4 hrs.) and 3400 (3); and REWM 2000 (3), 2500 (2), 4330 (3), 4530 (1) and 6 hrs. selected from other REWM upper-division (3000 or 4000 level) courses.

Rangeland Ecology and Watershed Management (REWM)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

1070. World Water Quality. 3. This course covers global water resources, fresh water demands, water quality issues, and water resources management on a watershed scale. Students become more knowledgeable about significance of availability and sustainability of water resources and water quality.

2000. Principles of Rangeland Management. 3. Basic principles of range management as they apply to various regions and vegetative types. Relationship of range management practices to livestock production, wildlife management, forestry, hydrology and other land uses. Introductory course for majors and non-majors. *Prerequisite:* LIFE 1001 or 1010.

2400 [2500]. Range Ecosystems and Plants. 4. Ecology of range ecosystems of western North America and identification of

200 most common plants species, including taxonomic keying. *Prerequisite:* REWM 2000 with a grade of C or better.

3000. Plant Ecophysiology/Plant Form and Function. 4. Integration of basic vascular plant anatomy, morphology, physiology within the contexts of modern evolutionary and ecological theory. Students receive in depth exposure to fluid flow, energetics, development, growth, general metabolism, and structure, and functions for plant cells, tissue and organs. *Prerequisite:* LIFE 2022 or LIFE 2023.

3100. Principles of Wildland Water Quality. 3. Basic principles of aquatic chemistry and water quality as they relate to watershed management practices including livestock production, agronomic production, mineral and natural gas extraction and other land uses. Cross listed with ENR 3100. *Prerequisite:* CHEM 1000. (Normally offered fall semester)

3390. Range Judging. 2. Judging rangelands based on soil, plant and animal resources and applying science-based information to make management decisions. Participation in a field trip and UW SRM judging teams is required including Plant Team and URME. This course is intended for members of the SRM competitive Teams. *Prerequisites:* C or better in REWM 2000, REWM 2400 and REWM 3020, as well as the Team Coach permission. (Normally offered spring semester)

3500. Rangeland Plant Ecophysiology. 3. Examines plant physiological processes that have application to ecological and land management issues. Topics include carbon assimilation, water relations, mineral nutrition as applied to plant distributions, plant and system responses to grazing, as well as plant tolerance of extreme conditions including drought, excessive temperatures and changes in climate. *Prerequisite:* LIFE 2022 or 2023. (Normally offered fall semester)

4000. Poisonous Plants and Plant Toxins. 3. Plants poisonous to livestock in Wyoming and the Mountain West; identification, ecology, toxic principles, physiologic responses of animals, situations leading to poisoning, control and management to prevent losses. *Prerequisite:* 12 hours of biological and chemical sciences. (Normally offered spring semester)

4051. Environmental Politics. 3. Analyzes environmentalism as a political phenomenon. Provides students with a basic understanding of how to analyze political issues by: (1) examining the historical and contemporary issues that produce controversy over environmental matters; and (2) surveying the impacts of these issues on the formulation and implementation

of laws, policies, and regulations. Cross listed with AMST, ENR, GEOG and POLS 4051. *Prerequisite:* POLS 1000.

4052. Federal Land Politics. 3. Examines the political forces that have shaped and continue to shape federal land policy and management. Explores the interactions between democratic decision making and science in the management of federal lands. Surveys the sources of controversy over federal land management and methods for harmonizing public demands with technical expertise. Cross listed with POLS/ENR/GEOG/AMST 4052. *Prerequisite:* POLS 1000.

4100. Nutritional Ecological Management of Range Herbivores. 3. Examines ecological processes and management of nutritional resources by domestic and wild rangeland herbivores. Topics include nutrient availability, nutritional demand, foraging behavior, diet composition, grazing systems, stocking rates, livestock/wildlife competition, predation, parasitism, plant toxicity, and influences on ecological condition. Students evaluate case studies and analyze nutritional data using current technologies. Dual listed with REWM 5100. *Prerequisite:* LIFE 1010 or LIFE 1020.

4103 [3103]. Range and Ranch Recreation. 3. Understanding of public demands for leisure use of public and private rangelands; potential impacts on rangeland resources, ranch practices and families and other rangeland users. Students prepare public range or private ranch recreation operations plan. Graduate students assist in preparation and presentation of lecture. Dual listed with REWM 5103. *Prerequisites:* C or better in REWM 2000 and CS course. (Normally offered spring semester)

4150 [3150]. Behavior Modification for Production of Grazing Herbivores. 3. Strategies for manipulation of behavior and management of the grazing herbivore will be developed from scientific and practical information. Designed to equip the student to manage for animal and natural resource production. Dual listed with REWM 5150. *Prerequisites:* C or better in REWM 2000 and REWM 3020 or ANSC 3100. (Normally offered spring semester)

4200. Reclamation of Drastically Disturbed Lands. 3. Overviews reclamation of drastically disturbed lands in the west, emphasizing surface mined lands. Includes principles of ecology, agronomy, soils and other relevant disciplines as applied to mitigate adverse environmental impacts of land disturbance. *Prerequisite:* LIFE 3400, AECL 2100. (Normally offered fall semester)

4285. Wildland Hydrology. 3. Teaches essential and unique characteristics of hydrologic cycle as occurred on range and forest lands, concentrating on quantification of these processes and storages. Cross listed with ENR 4285. Dual listed with REWM 5285. *Prerequisite:* QA (Normally offered fall semester)

4300 [3320]. Grass Taxonomy. 3. Identification of grasses and their place in range management and world agriculture. Dual listed with REWM 5300. *Prerequisite:* REWM 2500 or LIFE 2023. (Normally offered spring semester)

4330. Rangeland Ecosystem Assessment and Monitoring. 4. Assessment, monitoring, and analysis of rangeland ecosystems and processes. Students integrate sampling design, measurements of vegetation attributes, indicators of rangeland health, ecological site information, riparian and wildlife habitat values, utilization, and statistical applications to evaluate rangeland resource integrity and sustainable use. Students collect, analyze, and report data using current technologies. REWM students will be given enrollment preference. *Prerequisites:* REWM 2400 and STAT 2050 or STAT 2070. Concurrent enrollment in REWM 2400 and STAT 2050 or STAT 2070 is allowed with permission. (Normally offered fall semester)

4340. Reclamation Techniques Field Trip. 2. Provides increased comprehension of current land reclamation problems and solutions by means of a field trip to sites in region where land reclamation is occurring. *Prerequisite:* REWM 4200. (Normally offered fall semester)

4440. Applied Fire Ecology. 3. Course examines drivers and patterns of wildfire in rangeland and forested ecosystems, fire behavior, fuel characteristics, fire effects, suppression tactics and mitigation strategies, prescribed burning precautions and applications, applications/uses of fire to meet resource objectives, policies and regulations, and modeling software. Required field trips out of class time. Junior standing or greater class standing required. Dual listed with REWM 5440. *Prerequisite:* General biology and MATH 1400 or above.

4500. Rainfall-Runoff Modeling. 3. Introduction to hydrologic modeling that teaches the foundations of model development, calibration, and interpretation. Examines the different components of the water cycle and how they are being integrated into watershed models. Equips the students with the necessary skills to parameterize hydrologic models, understand the underlying principles, and interpret model outputs. Dual listed with REWM 5500. *Prerequisite:* REWM 4285.

4530. Seminar. 1 (Max. 2). Discusses pertinent range management problems. *Prerequisite:* REWM 2000 (earn at least a C) or ENR 4000.

4540. Problems. 1-4 (Max. 6). Experimental work or intensive reading and discussion on range management problems. Includes problems offered in the following areas of range management: natural resources ecology, livestock habitat, business, improvements, watershed, reclamation, extension, and international development. *Prerequisite:* basic training in field of problem selected and consent of instructor.

4550. Internship in _____. 1 (Max. 4). Supervised field experience in range management or disturbed land reclamation. No more than 4 credits. *Prerequisites:* basic course work in subject selected and consent of instructor.

4580. Rangeland Restoration Ecology. 3. Detailed analysis of various disturbed ecosystems unique to western rangelands. Primary emphasis on plant community restoration following degradation from edaphic, biotic, hydrologic, and topographic influences on degradation and strategies for vegetative rehabilitation. Strong focus on current research to formulate restoration strategies. Dual listed with REWM 5580. *Prerequisites:* REWM 4200 or LIFE 3400.

4700. Wildland Watershed Management. 3. Studies hydrological cycle with specific emphasis on the role of vegetation in hydrologic processes such as interception, surface detention storage, infiltration, percolation, run-off, and water quality. Utilization of watersheds and vegetation manipulation practices to modify these hydrologic processes. *Prerequisite:* LIFE 1001 or 1010. (Normally offered spring semester)

4710 [4180]. Watershed Water Quality Management. 3. Studies watershed processes controlling water quality. Examines impacts of land use activities such as agriculture production, livestock grazing, and mineral and natural gas extraction on surface water and ground water quality. Emphasis will be placed on water quality modeling and management. Dual listed with REWM 5710. *Prerequisites:* CHEM 1000. (Normally offered spring semester)

4750. Wildlife Habitat Restoration Ecology. 3. Emphasis on fundamental and applied aspects of restoration ecology for terrestrial wildlife habitats following anthropogenic and natural disturbances. Although the course overviews theoretical concepts applicable to many systems, there is a focus on applications for wildlife habitats in western North America. Dual listed with REWM 5750. *Prerequisites:* Minimum of 6 hours of Biology or Life Sciences courses.

4810. Experiments in Restoration. 2. Emphasis on the experimental design using examples from restoration science. Focus on experiments to test concepts in ecosystem science, food webs, population genetics, metapopulation biology, biodiversity and invasion, and climate change. Address topics in experimental, ecological restoration. Dual listed with REWM 5810. *Prerequisite:* STAT 2050 or equivalent.

4830. Ecological Applications for Wildland Management. 3. [WB◀(none)] Emphasis on applying understanding of interactions among components of rangelands to facilitate sustainable provision of ecosystem services. The influences of stochasticity and disturbances on ecosystem structure and function will be the focus of discussion and technical writing exercises. *Prerequisites:* WA, REWM 2000 (earn at least a C), LIFE 3400 (latter may be concurrent). (Normally offered fall semester)

4850. Rangeland Vegetation Management Techniques. 3. Uses applied ecological principles in restoration of degraded rangeland ecosystems to introduce methods for manipulating rangeland vegetation that satisfy land management objectives. Provides ecologically-sound practices to maintain optimal and sustained yield of rangeland products. *Prerequisites:* C or better in REWM 2000 and SB. (Normally offered spring semester)

4900. Rangeland Management Planning. 3. [WC◀COM3] Applies planning processes that integrate soil, vegetation, water, livestock, wildlife, and environmental regulatory considerations within the context of satisfying ecologically sustainable rangeland management objectives. *Prerequisites:* REWM 4830, ECON or AGE 1010 or 1020, SOIL 4120 or 4150 (may be concurrent), REWM 3020 (may be concurrent), REWM 4330 (may be concurrent). (Normally offered spring semester)

4990. Undergraduate Teaching Practicum. 1 (Max 2). Teaching experience in classroom or laboratory assisting faculty instructor. (Offered based on sufficient demand and resources)

5000. Range Resource Management. 3. Basic concepts and theories of rangeland resource management, trends in rangeland classification, grazing management and improvement practices. *Prerequisite:* graduate classification in agriculture or related natural resource subject matter areas.

5100. Nutritional Ecological Management of Range Herbivores. 3. Examines ecological processes and management of nutritional resources by domestic and wild rangeland herbivores. Topics include nutrient availability, nutritional demand, foraging behavior, diet

composition, grazing systems, stocking rates, livestock/wildlife competition, predation, parasitism, plant toxicity, and influences on ecological condition. Students evaluate case studies and analyze nutritional data using current technologies. Dual listed with REWM 4100.

5103. Range and Ranch Recreation. 3. Understanding of public demands for leisure use of and private rangelands; potential impacts on rangeland resources, ranch practices and families and other rangeland users. Preparation of public range or private ranch recreation operations plan. Graduate students assist in preparation and presentation of lecture. Dual listed with REWM 4103. *Prerequisites:* REWM 2000 and CS course.

5150. Behavior Modification for Production of Grazing Herbivores. 3. Strategies for manipulation of behavior and management of the grazing herbivore are developed from scientific and practical information. Designed to equip the student to manage for animal and natural resource production. Dual listed with REWM 4150. *Prerequisite:* REWM 2000 and ANSC/REWM 3020 or ANSC 3100.

5250. Water Resources Seminar. 1. Objective is to develop interaction among students from the various water resource disciplines to enhance their perspectives on how water problems are addressed within an interdisciplinary environment. *Prerequisite:* graduate status.

5285. Wildland Hydrology. 3. Teaches essential and unique characteristics of hydrologic cycle as occurs on range and forest lands, concentrating on quantification of these processes and storages. Cross listed with ENR 5285. Dual listed with REWM 4285. *Prerequisite:* graduate standing and University Studies QA.

5300. Grass Taxonomy. 3. Identification of grasses and their place in range management and world agriculture. Dual listed with REWM 4300. *Prerequisite:* REWM 2500 or LIFE 2023.

5400. Community Ecology. 3. Community ecology is the study of interactions within and among groups of species. This course focuses on (1) the major classical concepts and theories in community ecology, (2) the ways in which population dynamics can impact communities and how community dynamics can impact ecosystem processes and functioning, and (3) implementation of quantitative methods for conducting research that includes community ecology. Cross listed with ECOL 5400. *Prerequisite:* LIFE 3410 or equivalent.

5440. Applied Fire Ecology. 3. Course examines drivers and patterns of wildfire in rangeland and forested ecosystems, fire behavior, fuel characteristics, fire effects, suppression tactics and mitigation strategies, prescribed

burning precautions and applications, applications/uses of fire to meet resource objectives, policies and regulations, and modeling software. Required field trips out of class time. Dual listed with REWM 4440. *Prerequisite:* graduate standing.

5500. Rainfall-Runoff Modeling. 3. Introduction to hydrologic modeling that teaches the foundations of model development, calibration, and interpretation. Examines the different components of the water cycle and how they are being integrated into watershed models. Equips the students with the necessary skills to parameterize hydrologic models, understand the underlying principles, and interpret model outputs. Dual listed with REWM 4500. *Prerequisite:* REWM 5285.

5520. Ecology and Management of Grasslands. 3. Ecological nature, management strategies, and management problems of North American and world grassland ecosystems. *Prerequisites:* REWM 4300, 5300 and BOT 4700.

5580. Rangeland Restoration Ecology. 3. Detailed analysis of various ecosystems unique to western rangelands. Primary emphasis on plant community restoration following degradation from edaphic, biotic, hydrologic, and topographic factors. Application of ecological principles to rehabilitate vegetation and restore ecosystem function. Strong emphasis on current research to formulate restoration strategies. Dual listed with REWM 4580; cross listed with ECOL 5580.

5610. Quantitative Modeling in Landscape Ecology. 3. Emphasis on quantitative, spatial analysis of landscapes and application of these quantitative tools to making sound management decisions. Work with real data, acquire high-level quantitative skills, develop problem-solving skills, and discuss management application of model results. Analysis will encompass abiotic, biotic (plant and animal), and human use of ecological systems in a spatial context. Cross listed with ECOL 5610. *Prerequisites:* upper division stats course (e.g., STAT 4015 or STAT 4025) and graduate standing.

5640. Investigation. 1-4 (Max. 10). Research on specialized problems in range management. Investigations offered in the following areas of range management, habitat management, business management, range improvements and monitoring, watershed management, extension and international development. *Prerequisite:* graduate standing.

5680. Landscape Genetics. 3-4. Provides a unique opportunity for interdisciplinary training and international collaboration uniting some of the most active landscape genetics groups in North America and Europe. A key

objective of landscape genetics is to study how landscape modification and habitat fragmentation affect organism dispersal and gene flow across the landscape. Meeting this and other landscape genetic objectives requires highly interdisciplinary specialized skills making intensive use of technical population genetic skills and spatial analysis tools (spatial statistics, GIS tools and remote sensing). To bring these diverse topics and skills together effectively, we are using a distributed model of teaching. Population genetics, spatial analysis/statistics, and previous experience in Rare all extremely useful but not required. Cross listed with: ECOL 5680.

5710. Watershed Water Quality Management. 3. Studies watershed processes controlling water quality. Examines impacts of land use activities such as agriculture production, livestock grazing and mineral and natural gas extraction on surface water and ground water quality. Emphasis is placed on water quality modeling and management. Dual listed with REWM 4710. *Prerequisites:* CHEM 1000.

5750. Wildlife Habitat Restoration Ecology. 3. Emphasis on fundamental and applied aspects of restoration for terrestrial wildlife habitats following anthropogenic and natural disturbances. Although the course overviews theoretical concepts applicable to many systems, there is a focus on applications for wildlife habitats in western North America. Dual listed with REWM 4750. *Prerequisites:* Minimum of 6 hours of Biology or Life Sciences courses.

5810 [5800]. Experiments in Restoration. 2. Emphasis on the experimental design using examples from restoration science. Focus on experiments to test concepts in ecosystem science, food webs, population genetics, metapopulation biology, biodiversity and invasion, and climate change. Address topics in experimental, ecological restoration. Dual listed with REWM 4810. *Prerequisite:* graduate standing.

5830. Wildlife Habitat Ecology. 2. For students in wildlife and rangeland ecology emphasizing the relationships between wildlife populations and their habitats. Concepts forming the basis of wildlife habitat ecology including habitat and niche, habitat metrics, resource selection, habitat-relationships modeling, and habitat restoration and management. *Prerequisites:* Graduate-level course in statistics and graduate standing or instructor consent.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5980. Dissertation Research. 1-12 (Max. 48). Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate level degree program.

Minor in Soil Science

This program is designed to enhance soil expertise for students majoring in agricultural, natural resources, and environmental sciences degree programs. Undergraduate students minoring in Soil Science will enhance their job prospects with federal land management or conservation agencies (e.g., Forest Service, Bureau of Land Management, Natural Resources Conservation Society), state and federal regulatory agencies (e.g., Wyoming Department of Environmental Quality), mining and oil companies, environmental consulting companies, or scientific research organizations.

Course requirements (15 credit hours) for a Soil Science minor are: SOIL 2010, plus 11 credits of upper-division soil science courses for a total of 15 credits.

Soil Science Graduate Study

The department offers graduate work leading to the Master of Science and Doctor of Philosophy degrees in soil science, an affiliated graduate certificate in reclamation and restoration ecology, and an affiliated graduate option in water resources. Our faculty have active programs in soil-plant fertility and nutrition, soil morphology, genesis and classification, soil and water quality, environmental soil microbiology, soil and environmental chemistry, and soil and water physics.

Soil Science (SOIL)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB↔Q]).

2010. Introduction to Soil Science. 4. [SE↔(none)] Introduces soil ecological processes and management in terrestrial environments. Discusses interaction of soil, biological, chemical, morphological, and physical properties with land management in wild land and agricultural ecosystems. Emphasis is on plant response to soil conditions. *Prerequisites:* CHEM 1000 or CHEM 1020.

3000. Irrigated Agriculture. 3. Study of the complexity of plant/soil water relationships and its importance on irrigation. Soil and water relations, reference/crops evapotranspiration, and management of the water balance. Principles of chemigation, computer modeling/monitoring included. Methods for irrigation scheduling and the importance of water use efficiency as a strategy for water conservation. Cross listed with PLNT 3000. *Prerequisites:* MATH 1400, SOIL 2010.

3130. Environmental Quality. 3. Introduction to environmental quality issues and events. Course emphasizes impacts to soil, water, atmospheric, and vegetative ecosystems due to different nutrients and contaminants, including nitrogen, phosphorus, sulfur, trace elements, and organic chemicals. Current information pertaining to environmental quality is discussed and a field trip to the Union Pacific Tie Plant. Cross listed with ENR 3130. *Prerequisite:* complete at least 1 University Studies Science course SB, SP or SE. (Offered fall semester)

4100. Soil Physics. 3. Examines forms and interrelations of matter and energy in the soil environment. Primarily addresses fluxes and transformations of soil water and solutes, as well as physical properties that influence soil productivity. Dual listed with SOIL 5100. *Prerequisite:* SOIL 2010 or equivalent introductory soils course. (Offered spring semester)

4105. Soil Physics Laboratory. 2. Teaches students the methodology and use of equipment to measure soil physical properties in the laboratory and field. Experiments include particle size analysis, soil surface area, soil-water measurement with neutron probe and TDR, field infiltration rate, soil-water retention curve, soil pore size distribution saturated and unsaturated conductivities, soil water potential and solute breakthrough curve. Dual listed with SOIL 5105. *Prerequisite:* SOIL 2010.

4120. Genesis, Morphology and Classification of Soils. 4. Processes of soil development and methods of description, survey and classification. Includes field trips which examine soils in the Laramie Basin and surrounding mountains. Dual listed with SOIL 5120. *Prerequisite:* SOIL 2010. (Offered fall semester)

4130. Chemistry of the Soil Environment. 3. Introduction to the chemical properties and reactions that occur in the soil environment. Fundamental principles of soil mineralogy, organic matter and equilibrium chemistry as they relate to soil chemical reactions, plant nutrient availability and pedogenetic processes will be emphasized. Dual listed with SOIL 5130. *Prerequisite:* SOIL 2010, CHEM 1030 or CHEM 1060. (Offered spring semester)

4140. Soil Microbiology. 4. Fundamental principles of soil microbiology and how they relate to microbial ecology, environmental contamination, agriculture and forestry. Dual listed with SOIL 5140; cross listed with MICR 4140. *Prerequisite:* SOIL 2010.

4150. Forest and Range Soils. 3. Characteristics and management of forest and range soils primarily in arid environments. Examines pedagogical units representative of forests and ranges and soil properties, such as nutrient availability and water relations that influence plant growth. Dual listed with SOIL 5150. *Prerequisites:* SOIL 2010. (Normally offered fall semester)

4160. Soil Fertility and Fertilizers. 3. Physical, chemical, and biological aspects of soils that impact fertilizer fate, uptake, and plant growth. Dual listed with SOIL 5160. *Prerequisite:* SOIL 2010. (Normally offered fall semester of odd-numbered years)

4540. Microbial Diversity and Ecology. 4. Introduces the diversity and ecology of soil microbes through an integrated lecture and laboratory course. Emphasis on molecular approaches to analyzing microbial diversity and evolution, and student-directed experimental design. Provides a continuum of realistic research experiences in molecular microbial ecology, from field work to evolutionary analysis of DNA sequence data. Cross listed with MOLB/MICR 4540. Dual listed with MOLB/SOIL/ECOL 5540. *Prerequisites:* MOLB 2210.

4565. Research: Soil Science. 1-4 (Max. 6). Library, laboratory, and/or green-house investigations on select research topics. Graduate students will be required to give a presentation to the soil science group on their final product/report. Dual listed with SOIL 5565. *Prerequisite:* basic training in soil science research.

5100. Soil Physics. 3. Examines the forms and interrelations of matter and energy in the soil environment. Fluxes and transformations of soil water and solutes are addressed primarily, as well as physical properties which influence soil productivity. Dual listed with SOIL 4100. *Prerequisite:* MATH 2310.

5105. Soil Physics Laboratory. 2. Students learn methodology and use of equipment to measure soil physical properties in the laboratory and field. Experiments include particle size analysis, soil surface area, soil-water measurement with neutron probe and TDR, field infiltration rate, soil-water retention curve, soil pore size distribution, saturated and unsaturated conductivity, soil water potential, and solute breakthrough curve. Dual listed with SOIL 4105. *Prerequisite:* SOIL 2010.

5110. Modeling Water and Chemical Transport in Vasoe Zone and Groundwater Systems. 4. Mathematical models will be formulated and applied to simulate water flow and chemical transport in soil and groundwater systems. Soil spatial variability and heterogeneity will be considered in the modeling processes. Using and comparing models, students will obtain the capability to transfer a physical problem to a mathematical model, to use numerical methods, such as the finite element method, to solve the mathematical problem, and to correctly interpret the numerical outputs. Students will develop and program numerical solutions for select problems and will utilize existing codes for modeling a variety of comprehensive problems.

5120. Genesis, Morphology, and Classification of Soils. 4. Processes of soil development and methods of description, survey and classification. Includes field trips which examine soils in the Laramie Basin and surrounding mountains. Dual listed with SOIL 4120. *Prerequisite:* SOIL 2010.

5130. Chemistry of the Soil Environment. 3. Evaluation of the chemical and physical properties and reactions that occur in the soil environment. Fundamental principles of soil mineralogy, organic matter, and equilibrium chemistry as they relate to soil chemical reactions, plant nutrient availability, and pedogenetic processes will be emphasized. Dual listed with SOIL 4130. *Prerequisite:* MATH 1400, CHEM 1030 or CHEM 1060 and SOIL 2010.

5140. Soil Microbiology. 4. Fundamental principles of soil microbiology and how they relate to microbial ecology, environmental contamination, agriculture, and forestry. Dual listed with SOIL 4140; cross listed with MICR 5140. *Prerequisite:* SOIL 2010

5150. Forest and Range Soils. 3. Characteristics and management of forest and range soils primarily in arid environments. Examines pedagogical units representative of forest and ranges and soil properties, such as nutrient availability and water relations, which influence plant growth. Dual listed with SOIL 4150. *Prerequisite:* SOIL 2010 and LIFE 2020.

5160. Soil Fertility and Fertilizers. 3. Physical, chemical and biological aspects of soils which impact fertilizer fate, uptake and plant growth. Dual listed with SOIL 4160. *Prerequisite:* SOIL 2010.

5430. Applied Geostatistics. 3. Designed to provide general geostatistical analyses and their applications for spatial random variables and functions. Topics covered include variogram, cross validation, kriging, cokriging, sampling strategies, and both non-conditional and conditional simulations. Several geostatistics packages are used to analyze real field data and students are encouraged to use their own data for practicing geostatistical applications. Examples are taken from geohydrology, soil science, crop science, mining, and various environmental studies. Cross listed with GEOL/STAT 5430. *Prerequisite:* STAT 4020.

5540. Microbial Diversity and Ecology. 4. Introduces the diversity and ecology of soil microbes through an integrated lecture and laboratory course. Emphasis on molecular approaches to analyzing microbial diversity and evolution, and student-directed experimental design. Provides a continuum of realistic research experiences in molecular microbial ecology, from field work to evolutionary analysis of DNA sequence data. Cross listed with MOLB/MICR/SOIL 4540. Dual listed with MOLB/ECOL 5540. *Prerequisites:* MOLB 2210.

5565. Research in Soil Science. 1-4 (Max. 6). Library, laboratory, and/or greenhouse investigations on select research topics. Graduate students will be required to give a presentation to the soil science group on their final product/report. Dual listed with SOIL 4465. *Prerequisite:* Basic training in soil science research. SOIL 5565 reserved for graduate students.

5590. Special Topics in Soil Science. 1-3 (Max. 6). Special topics in soil science. Offered as an individual or small group basis as appropriate. Intended to accommodate various specialized subjects not offered on a regular basis. Students may enroll in more than one section of this course. Dual listed with SOIL 4590. *Prerequisite:* consent of instructor.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5980. Dissertation Research. 1-12 (Max. 48). Graduate level course designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate level degree program.

Department of Family and Consumer Sciences

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ERIN IRICK, B.S. Kansas State University 2000; M.S. 2006; Ph.D. Oklahoma State University 2013; Associate Professor of Design, Merchandising, and Textiles 2019, 2013.

CHRISTINE WADE, B.S. Willamette University 2001; M.S. University of Wyoming 2005; Ph.D. 2008; Associate Professor of Human Development and Family Sciences 2015, 2008

Assistant Professors:

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JILL KEITH, B.S. North Dakota State University 2000; M.S. Capella University 2009; Ph.D. North Dakota State University 2016; Assistant Professor of Human Nutrition and Food/Dietetics 2016.

ALYSSA McELWAIN, B.A. Kansas State University 2006; M.S. Purdue University 2008; Ph.D. Auburn University 2015; Assistant Professor of Human Development and Family Sciences 2015.

BERNARD STEINMAN, B.A. University of Washington 1991; M.S. Mississippi State University; Ph.D. University of Southern California 2010; Assistant Professor of Human Development and Family Sciences 2015.

Academic Professionals:

DIANNE BARDEN, B.S. University of Wisconsin - Stout 1980; M.A. Grand Canyon University 2004; Assistant Lecturer - Coordinator Distance Degree Programs 2006.

MARK BITTNER, B.S. 1989; M.S. University of Wyoming 1993; Senior Lecturer, Human Development and Family Sciences 2012, 2008, 1991.

MEGAN McGUFFEY SKINNER, B.S. University of Wyoming 2010; M.H.S. Boise State University 2014; Assistant Lecturer; Director, Didactic Program in Nutrition and Dietetics 2019.

TREVA SPROUT AHRENHOLTZ, B.S. 1993, 1997 University of Wyoming; M.S. 1995; Associate Lecturer, Design, Merchandising, and Textiles 2005, 2013.

Professor Emeritus:

Donna Brown, Bruce Cameron, Saul Feinman, Michael Liebman, Judith A. Powell, Rhoda Schantz, Virginia Vincenti, Mary Kay Wardlaw, Randolph R. Weigel, Karen Williams

Our mission is to enhance the physical, social, and economic well-being of individuals, families, and communities, emphasizing healthy and sustainable living across the lifespan. We fulfill our mission through instructional, research, and outreach/extension efforts that challenge, motivate, and inspire.

Family and Consumer Sciences integrates the fundamental components of human life—food, shelter, clothing, human relationships, and family—with larger societal systems. Through programs in textiles, apparel and design; food and nutrition; and human development and family sciences, our department prepares learners to meet the opportunities and challenges of today's complex world.

All students pursuing the Bachelor of Science degree in Family and Consumer Sciences are required to complete a minimum of 120 credit hours that include a) University Studies requirements (USP); b) departmental core curriculum; and c) courses in one of the following individual program options: dietetics (application only), human nutrition and food, human development and family sciences, professional child development (online only), or design, merchandising and textiles. Minors in apparel design, human development and family sciences, human nutrition, and interior design are also available.

Grade Requirements

Majors are required to pass all courses within the Department of Family and Consumer Sciences with a grade of C or above. Students enrolled in family and consumer sciences minors are required to take all courses required for the minor for letter grade and complete each course with a grade of C or above.

Security Screening

All students applying for admission to the Professional Child Development option are required to complete a security screening before program entry. Students in the Human Development and Family Sciences option must complete their security screening upon declaration of their major. Failure to satisfactorily complete this requirement will result in the student being dropped from or denied entry to the program.

Family and Consumer Sciences Core Requirements

A core curriculum is required of all family and consumer sciences majors. This requirement is based on a common body of knowledge in family and consumer sciences that includes concepts relevant to all program options.

The family and consumer sciences core consists of the following courses:

FCSC 2200 Professionalism & Communication in FCSC.....	3
<i>Plus one course from each of the following categories outside your program option - in consultation with your advisor:</i>	
<u>Human Nutrition and Food:</u>	
FCSC 1141 Principles of Nutrition.....	3
FCSC 1150 Scientific Study of Food.....	3
<u>Design, Merchandising and Textiles:</u>	
FCSC 1180 Applied Design	3
FCSC 2165 Introduction to Fashion and Dress	3
FCSC 2180 Housing and Residential Design	3
FCSC 3171 Introduction to Textile Science..	3
<u>Human Development and Family Sciences:</u>	
FCSC 2110 Fundamentals of Aging & Human Development	3
FCSC 2121 Child Development.....	4
FCSC 2131 Family Relations	3
FCSC 2133 Intimate Relationships	3
FCSC 3110 Personal Finance.....	3
FCSC 3220 Multicultural Influences on Children and Families	3

Family and Consumer Sciences Student Learning Outcomes

Students graduating from the Department of Family and Consumer Sciences will be proficient in their program option content as well as be able to effectively communicate (both written and orally), possess intellectual skills (such as critical and creative thinking and problem solving), and demonstrate appropriate levels of professionalism.

Family and Consumer Sciences Program Options

Students should obtain and follow a degree plan for their chosen program option. Standards established by several professional organizations require completion of specific courses in addition to the family and consumer sciences core and USP requirements. All students are assigned to a professional advisor and a faculty mentor. Students should work closely with their advisor to be sure all degree requirements are met.

Dietetics

The Registered Dietitian Nutritionist (RDN) is a food and nutrition expert who has met the academic and professional requirements to qualify for the Registration Examination for Dietitians. Registered dietitian nutritionists work in a variety of settings that include, but are not limited to, hospitals, private practice, health-care facilities, community and public health, food and nutrition industry, business, sports nutrition, corporate wellness programs, academia, and research.

The UW Didactic Program in Nutrition and Dietetics (DPND) is nationally accredited by the Accreditation Council for Education in Nutrition and Dietetics (ACEND) of the Academy of Nutrition and Dietetics. The program provides the required dietetics coursework needed to pursue an approved post-graduation supervised practice experience – dietetic internship. The academic requirements and supervised practice experience must be completed before the student is eligible for the Registration Examination for Dietitians administered by the Commission on Dietetic Registration (CDR), the credentialing agency for the Academy.

Completion of this degree requires a minimum of 120 credit hours that include a) University Studies requirements (USP), b) departmental core curriculum, and c) specific courses for this program. Courses should be selected in consultation with a student’s advisor to enhance the student’s educational experience and to ensure fulfillment of upper division course requirements (42 credit hours overall with 30 taken from UW).

Entrance into the DPND is made only through an application process. Each prospective DPND student will initially enter the Human Nutrition and Food option. It is recommended that students apply to the DPND in the spring semester of their sophomore year. A cumulative grade point average of 3.0 is required for program admission.

Students must complete the following courses with a minimum 3.0 grade point average prior to DPND application:

- FCSC 1141 Principles of Nutrition*3
- FCSC 1150 Scientific Study of Food*3

- FCSC 2141 Nutrition Controversies*2
 - FCSC 2200 Professionalism and Communication in FCSC*3
 - CHEM 1020 General Chemistry I*4
 - CHEM 1030 Gen. Chemistry II*4
 - ENGL 1010 College Comp/Rhetoric*3
 - LIFE 1010 General Biology*4
 - MATH 1400 College Algebra*3
 - MOLB 2021 General Microbiology*4
 - PSYC 1000 General Psychology*3
 - SOC 1000 Sociological Principles*3
- *Grade of C or better required

In addition to USP and upper division requirements, students must complete the following courses after admission to the DPND while maintaining an overall grade point average of 3.000. Failure to maintain a grade point average of 3.000 could result in program probation and/or suspension.

- FCSC 3142 Geriatric Nutrition*2
- FCSC 3145 Sports Nutrition & Metabolism*3
- FCSC 3147 Community Nutrition*3
- FCSC 3150 Intermediate Foods*2
- FCSC 3152 Food Systems Production*3
- FCSC 4044 Maternal, Infant, and Adolescent Nutrition*3
- FCSC 4145 Advanced Nutrition*4
- FCSC 4147 Nutrition and Weight Control* ...3
- FCSC 4150 Experimental Foods*3
- FCSC 4210 Therapeutic Nutrition I*4
- FCSC 4220 Therapeutic Nutrition II*4
- FCSC 4230 Therapeutic Nutrition Counseling*2
- FCSC Core Elective in DMT*3
- FCSC Core Elective in HDFS*3
- CHEM 2300 Intro Organic Chemistry* or CHEM 2420 Organic Chemistry I*4
- ENGL 4010 Technical Writing in the Professions3
- MGT 3210 Management and Organization3
- MOLB 3610 Principles of Biochemistry*4
- MOLB 4100 Clinical Biochemistry4
- STAT 2050 Fundamentals of Statistics4
- KIN 2040 Human Anatomy3
- KIN 2041 Human Anatomy Lab1
- ZOO 3115 Human Systems Physiology4

Degree Minimum 120

*Grade of C or better required

Human Nutrition and Food

Students who graduate from the human nutrition and food program option will be prepared to pursue careers in human nutrition, the food industry, or to pursue graduate degrees.

Completion of this degree requires a minimum of 120 credit hours that include a) University Studies requirements (USP), b) departmental core curriculum, and c) specific courses for this program. Courses should be selected in consultation with a student’s advisor to enhance the student’s educational experience and to ensure fulfillment of upper division course requirements (42 credit hours overall with 30 taken from UW).

Required Courses:

- FCSC 1141 Principles of Nutrition*3
- FCSC 1150 Scientific Study of Food*3
- FCSC 2141 Nutrition Controversies*2
- FCSC 2200 Professionalism and Communication in FCSC*3
- FCSC 3142 Geriatric Nutrition*2
- FCSC 4044 Maternal, Infant, and Adolescent Nutrition*3
- FCSC 4145 Advanced Nutrition*4
- FCSC 4147 Nutrition and Weight Control* ...3
- FCSC 4150 Experimental Foods*3
- FCSC Core Elective in DMT*3
- FCSC Core Elective in HDFS*3
- FCSC HNF Elective*3
- CHEM 1020 General Chemistry I*4
- CHEM 1030 Gen. Chemistry II4
- CHEM 2300 Intro Organic Chemistry or CHEM 2420 Organic Chemistry I4
- ENGL 4010 Technical Writing in the Professions3
- LIFE 1010 General Biology*4
- MATH 1400 College Algebra3
- MOLB 2021 General Microbiology4
- PSYC 1000 General Psychology3
- SOC 1000 Sociological Principles3
- STAT 2050 Fundamentals of Statistics4
- KIN 2040 Human Anatomy3
- KIN 2041 Human Anatomy Lab1
- ZOO 3115 Human Systems Physiology4

Degree Minimum 120

*Grade of C or better required

Professional Child Development

The professional child development program option is offered by distance delivery only but has the same quality and requirements as on-campus programs. All students are assigned an advisor who works closely with them throughout their program. Completion

of this degree prepares students for teaching and administrative positions in early childhood development and care.

Entry into this program is by application only. Students must apply for admission to UW first. Official transcripts from all institutions attended must be submitted to UW Admissions. Once a student has applied and their transcripts have been received, their application will be reviewed. Transcripts will not be analyzed prior to application. Applicants must also satisfactorily complete a mandatory security screen (background check).

Completion of this degree requires a minimum of 120 credit hours that include a) University Studies requirements (USP), b) departmental core curriculum, and c) specific courses for this program. Courses should be selected in consultation with a student's advisor to enhance the student's educational experience and to ensure fulfillment of upper division course requirements (42 credit hours overall with 30 taken from UW).

Required Courses Before Program Entry:

EDEC 1020 Introduction to Early Childhood Education3
 PSYC 1000 General Psychology3
 SOC 1000 Sociological Principles3
 Completion of a course (i.e., ENGL 1010) that meets the University Studies Program (USP) COM1 requirement

Required Courses After Program Entry:

FCSC 1141 Principles of Nutrition*3
 FCSC 2165 Intro to Fashion and Dress or FCSC 3171 Introduction to Textile Science**3
 FCSC 2050 Safety, Nutrition and Health in Early Childhood Programs.....2
 FCSC 2121 Child Development.....4
 FCSC 2131 Family Relations3
 FCSC 2133 Intimate Relationships3
 FCSC 2200 Professionalism and Communication in FCSC.....3
 FCSC 3110 Personal Finance or FCSC 4112 Family Decision Making and Resource Management3
 FCSC 3119 Parent Child Relationships3
 FCSC 3122 Adolescence.....3
 FCSC 3220 Multicultural Influences on Children and Families3
 FCSC 4124 Families of Young Children with Special Needs3
 FCSC 4127 Directing Preschool and Daycare Programs3
 FCSC 4130 Internship in Child Development or FCSC 4131 Administrative Internship in Child Development8

FCSC 4138 Family Stress and Coping3
 EDEC 3000 Observing Young Children.....3
 EDEC 3220 School Programs for Young Children3
 EDEC 4320 Oral and Written Language Acquisition3
 ENGL 4010 Technical Writing in the Professions or ENGL 4075 Writing for Non-Profits3
 PSYC 4310 Developmental Psychopathology3
Degree Minimum 120

*Meets FCSC Core Elective in HNF
 **Meets FCSC Core Elective in DMT

Human Development and Family Sciences

This program option provides a strong foundation in the areas of human development and family sciences while allowing personalized selection of electives and internship experiences that support specific student interests. The program prepares students to work in a variety of settings, serving individuals and families across the lifespan or to pursue graduate level education. Upon declaring this program option, students must satisfactorily complete a mandatory security screen (background check).

Completion of this degree requires a minimum of 120 credit hours that include a) University Studies requirements (USP), b) departmental core curriculum, and c) specific courses for this program. Courses should be selected in consultation with a student's advisor to enhance the student's educational experience and to ensure fulfillment of upper division course requirements (42 credit hours overall with 30 taken from UW).

Required Courses:

FCSC 2110 Fundamentals of Aging and Human Development3
 FCSC 2121 Child Development.....4
 FCSC 2131 Family Relations3
 FCSC 2133 Intimate Relationships3
 FCSC 2200 Professionalism and Communication in FCSC.....3
 FCSC 3110 Personal Finance.....3
 FCSC 3119 Parent Child Relationships3
 FCSC 3122 Adolescence.....3
 FCSC 3220 Multicultural Influences on Children and Families3
 FCSC 4112 Family Decision Making and Resource Management3
 FCSC 4117 Understanding Community Leadership3
 FCSC 4118 Family Policy3
 FCSC 4125 Professional Practices in HDFS3

FCSC 4132 Internship in Human Development and Family Sciences or FCSC 4130 Internship in Child Development or FCSC 4131 Administrative Internship in Child Development8
 FCSC 4135 Program Evaluation3
 FCSC 4138 Family Stress and Coping3
 FCSC Core Elective in DMT3
 FCSC Core Elective in HNF.....3
 ENGL 4010 Technical Writing in the Professions or ENGL 4075 Writing for Non-Profits3
 PSYC 1000 General Psychology3
 SOC 1000 Sociological Principles3
Degree Minimum 120

HDFS Career Track for Family and Consumer Sciences Teacher Certification

A career track, leading to certification/ licensure to teach Family and Consumer Sciences in secondary schools, is available for majors in the Human Development and Family Sciences (HDFS) concentration. This program is made possible through a partnership agreement with UW Family and Consumer Sciences, Colorado State University (CSU) Family and Consumer Sciences program and the CSU Center for Educator Preparation. While meeting the requirements for the HDFS concentration, students will use electives to obtain expertise in other FCS specializations needed to teach adolescents in Wyoming and other state secondary programs. As a senior, students will then take the remaining courses needed to meet Wyoming and Colorado certification/ licensure requirements at CSU in Ft. Collins. In their last semester, Wyoming students may complete their student teaching requirements in Southern Wyoming FCS school classrooms with supervision by an FCS teacher educator. Students obtain expertise in areas needed to teach Family and Consumer Sciences in Wyoming and other state secondary school programs. Concurrent enrollment semesters will be required. By participating in this partnership, students earn dual bachelor's degrees—one from UW and one from CSU. Students must earn a minimum of 154 credit hours between the two programs (minimum of 120 at UW and a minimum of 34 at CSU) in order to be awarded a degree from each institution. In addition, students meet the requirements to apply for certification/licensure in Wyoming and in Colorado. Both licenses are reciprocal in many other states.

Upon declaring this career track, students must satisfactorily complete a mandatory security screen (background check). Advising

will provide careful attention to the uniqueness of individual student situations and academic choices.

Students must meet all entry requirements at UW and CSU. Students in the CSU licensure program are required to earn a C or above in all content courses and teacher licensing courses, and a passing score on the appropriate licensing exam. Therefore, a C or above must be earned in all courses and an overall 2.750 GPA to be transferred to CSU to fulfill their program requirements.

Required Courses:

FCSC 1141 Principles of Nutrition.....3
 FCSC 1150 Scientific Study of Food.....3
 FCSC 2165 Introduction to Fashion and Dress or FCSC 1170 Introduction to Apparel Construction.....3
 FCSC 1180 Applied Design.....3
 FCSC 2110 Fundamentals of Aging and Human Development.....3
 FCSC 2121 Child Development.....4
 FCSC 2131 Family Relations.....3
 FCSC 2133 Intimate Relationships.....3
 FCSC 2180 Housing and Residential Design.....3
 FCSC 2188 Interior Design Studio I.....3
 FCSC 2200 Professionalism and Communication in FCSC.....3
 FCSC 3110 Personal Finance.....3
 FCSC 3119 Parent Child Relationships.....3
 FCSC 3122 Adolescence.....3
 FCSC 3160 Merchandise Retailing and Buying.....3
 FCSC 3220 Multicultural Influences on Children and Families.....3
 FCSC 4112 Family Decision Making and Resource Management.....3
 FCSC 4113 Consumer Issues.....3
 FCSC 4118 Family Policy.....3
 FCSC 4124 Families of Young Children with Special Needs.....3
 FCSC 4125 Professional Practices in HDFS.....3
 FCSC 4138 Family Stress and Coping.....3
 CHEM 1000 Introductory Chemistry or CHEM 1020 General Chemistry I.....4
 COJO 1030 Interpersonal Communication 3
 ECON 1000 Global Economic Issues or ECON 1010 Principles of Macroeconomics or ECON 1020 Principles of Microeconomics.....3
 EDST 2480 Diversity and Politics of Schooling.....4
 ENGL 1010 College Composition and Rhetoric.....3

ENGL 4010 Technical Writing in the Professions.....3
 HIST 1211 U.S. to 1865 or HIST 1221 U.S. from 1865.....3
 LIFE 1002 Discovering Science or LIFE 1003 Current Issues in Biology or LIFE 1010 General Biology.....4
 MATH 1400 College Algebra.....3
 PSYC 1000 General Psychology.....3
 SOC 1000 Sociological Principles.....3
 STAT 2050 Fundamentals of Statistics or STAT 2070 Intro Statistics for Social Sciences.....4

Three additional semesters are required for completion of this teacher certification option. The first semester after completing UW on-campus coursework will require concurrent enrollment at UW and CSU. Required UW course FCSC 4117 (online – 3 credit hours) will be taken while enrolled at CSU to preserve WEU eligibility. Four additional credit hours must be transferred to UW from the second and third semesters' coursework at CSU to meet UW's 120 credit hour graduation requirement.

First Semester - Concurrent Fall Semester UW/CSU

EDUC 331 Educational Technology.....2
 EDUC 340 Literacy and the Learner – Phase I – RL (Not included in WUE tuition).....3
 EDUC 350 Instruction I: Individualization/ Mgt – Phase II – TL.....3
 EDUC 386 Practicum – Instruction I – Phase II – TL 1
 EDCT 451 Methods, FCS Education.....4
 FCSC 4117 Understanding Community Leadership – online from UW.....3

Second Semester - Spring Semester at CSU

EDUC 450 Instruction II: Standards/ Assessment – Phase III - T.....4
 EDUC 486 Practicum – Instruction II – Phase III - TL 1
 FACS 479 Colloquium - FCS.....2
 Transfer one of the following to UW:
 ART/HUM (Choose one: E140, PHIL 1000 or TH141) or HES 145 Health and Wellness.....3

Final Semester - Fall Semester at CSU

EDCT 485 Student Teaching – Phase IV -TL.....11
 ECDT 492 Seminar – Professional Relations– Phase IV – TL (Transfer to UW).....1

Total UW Degree Minimum 120
Total CSU Degree Minimum 34
Total for both degrees 154

Design, Merchandising, and Textiles

Design, Merchandising, and Textiles is a diverse and competitive field in which individuals plan, provide, and promote apparel, interiors, and related goods desired by the consumer. This program offers three individual tracks: Apparel Design and Product Development; Interior Design; and Merchandising. The Apparel Design and Product Development track allows students to develop the technical and creative skills necessary for the creation of textile products from concept to finished product. The Interior Design track prepares students to creatively and effectively solve design problems for professional practice in residential and commercial interior design. The Merchandising track offers knowledge and application of business principles within the fashion and interior industries, entry into the world of retailing, and marketing techniques for apparel and interior furnishings. Throughout coursework, concepts of sustainable design and manufacturing, as well as the influence of design on well-being will be highlighted. Students will take a series of Design, Merchandising, and Textiles program core classes to gain experience with all three tracks. Students will be prepared for careers ranging from small business in Wyoming and rural areas of the West, to the highly competitive, fast paced global marketplace. All Design, Merchandising, and Textiles students are required to participate in a three-credit-hour internship, international field study tour, or a study abroad program.

Completion of this degree requires a minimum of 120 credit hours that include a) University Studies requirements (USP), b) departmental core curriculum, and c) specific courses for this program. Courses should be selected in consultation with a student's advisor to enhance the student's educational experience and to ensure fulfillment of upper division course requirements (42 credit hours overall with 30 taken from UW).

Apparel Design and Product Development Track

Required Courses:

FCSC 1141 Principles of Nutrition*.....3
 FCSC 1170 Introduction to Apparel Construction.....3
 FCSC 1175 Design Communication.....3
 FCSC 1180 Applied Design.....3
 FCSC 1185 Introduction to the DMT Industry.....3
 FCSC 2165 Introduction to Fashion and Dress.....3
 FCSC 2175 Fashion Illustration.....3

FCSC 2185 Trend Forecasting and Analysis 3	FCSC 2188 Interior Design Studio I.....3	FCSC 2200 Professionalism and Communication in FCSC.....3
FCSC 2188 Interior Design Studio I.....3	FCSC 2200 Professionalism and Communication in FCSC.....3	FCSC 2210 Fashion Show Event Planning...2
FCSC 2200 Professionalism and Communication in FCSC.....3	FCSC 2210 Fashion Show Event Planning...2	FCSC 3110 Personal Finance**.....3
FCSC 2210 Fashion Show Event Planning...2	FCSC 3110 Personal Finance**.....3	FCSC 3160 Merchandise Retailing and Buying .....3
FCSC 2270 Advanced Apparel Construction .....3	FCSC 3171 Introduction to Textile Science..3	FCSC 3171 Introduction to Textile Science..3
FCSC 3110 Personal Finance**.....3	FCSC 3173 Visual Merchandising and Promotion .....3	FCSC 3173 Visual Merchandising and Promotion .....3
FCSC 3171 Introduction to Textile Science..3	FCSC 3180 Contract Design I.....3	FCSC 3185 Product Development through Design Thinking.....3
FCSC 3173 Visual Merchandising and Promotion .....3	FCSC 3185 Product Development through Design Thinking.....3	FCSC 4160 Merchandising Strategies and Technology .....3
FCSC 3174 Flat Pattern Design .....3	FCSC 3188 Interior Design Studio II.....3	FCSC 4171 Advanced Textiles and Product Evaluation .....3
FCSC 3175 Apparel Design through Draping .....3	FCSC 3288 Environmental Psychology and Inclusive Design .....1	FCSC 4172 Advanced Textiles and Product Evaluation Lab.....1
FCSC 3185 Product Development through Design Thinking.....3	FCSC 4171 Advanced Textiles and Product Evaluation .....3	FCSC 4172 Advanced Textiles and Product Evaluation Lab.....1
FCSC 4171 Advanced Textiles and Product Evaluation .....3	FCSC 4172 Advanced Textiles and Product Evaluation Lab.....1	FCSC 4176 Historic Clothing.....3
FCSC 4172 Advanced Textiles and Product Evaluation Lab.....1	FCSC 4181 Global Trade and Sourcing for Textile Products.....3	FCSC 4181 Global Trade and Sourcing for Textile Products.....3
FCSC 4176 Historic Clothing.....3	FCSC 4182 Environmental Sustainability in DMT .....3	FCSC 4182 Environmental Sustainability in DMT .....3
FCSC 4178 Fiber Arts.....3	FCSC 4188 Contract Design II.....3	FCSC 4970 Internship or International Study .....3
FCSC 4181 Global Trade and Sourcing for Textile Products.....3	FCSC 4288 Professional Practice and Advanced Interiors Studio.....4	ACCT 2010 Principles of Accounting I.....3
FCSC 4182 Environmental Sustainability in DMT .....3	FCSC 4970 Internship or International Study .....3	AGEC 1010 Principles of Macroeconomics or AGECEC 1020 Principles of Microeconomics .....3
FCSC 4185 Product Development and Technology .....3	ARE 1600 Architectural Design Studio I...3	CHEM 1000 Introductory Chemistry.....4
FCSC 4190 Apparel Collection Development .....3	ARE 2410 Fundamentals of Building Performance .....3	MATH 1000 Problem Solving or MATH 1400 College Algebra .....3
FCSC 4970 Internship or International Study .....3	ARE 2600 Architectural Design Studio II...3	MGT 3210 Management and Organization..3
AGEC 1010 Principles of Macroeconomics or AGECEC 1020 Principles of Microeconomics .....3	ARE 3030 History of Architecture.....3	MKT 3210 Introduction to Marketing.....3
CHEM 1000 Introductory Chemistry.....4	ART 2020 Art History II.....3	MKT 3310 Professional and Technical Selling .....3
MATH 1000 Problem Solving or MATH 1400 College Algebra .....3	CHEM 1000 Introductory Chemistry or CHEM 1020 General Chemistry I.....4	MKT 4240 Consumer Behavior .....3
MGT 3210 Management and Organization..3	ECON 1000 Global Economic Issues.....3	SOC 1000 Sociological Principles or PSYC 1000 General Psychology.....3
MKT 3210 Introduction to Marketing.....3	ENR 4600 Campus Sustainability.....3	<i>Degree Minimum 120</i>
SOC 1000 Sociological Principles or PSYC 1000 General Psychology.....3	MGT 3210 Management and Organization..3	*Meets FCSC Core Elective in HNF
<i>Degree Minimum 120</i>	MKT 3210 Introduction to Marketing.....3	**Meets FCSC Core Elective in HDFS
*Meets FCSC Core Elective in HNF	PSYC 1000 General Psychology.....3	A Marketing or Entrepreneurship minor through the College of Business is recommended for students in this career track.
**Meets FCSC Core Elective in HDFS	<i>Degree Minimum 120</i>	

*Meets FCSC Core Elective in HNF

**Meets FCSC Core Elective in HDFS

Interior Design Track

Required Courses:

FCSC 1141 Principles of Nutrition*.....3
FCSC 1170 Introduction to Apparel Construction .....3
FCSC 1175 Design Communication .....3
FCSC 1180 Applied Design.....3
FCSC 1185 Introduction to the DMT Industry .....3
FCSC 2180 Housing and Residential Design.....3
FCSC 2185 Trend Forecasting and Analysis .....3

Merchandising Track

Required Courses:

FCSC 1141 Principles of Nutrition*.....3
FCSC 1170 Introduction to Apparel Construction .....3
FCSC 1175 Design Communication .....3
FCSC 1180 Applied Design.....3
FCSC 1185 Introduction to the DMT Industry .....3
FCSC 2165 Introduction to Fashion and Dress .....3
FCSC 2185 Trend Forecasting and Analysis 3
FCSC 2188 Interior Design Studio I.....3

Family and Consumer Sciences Minors

Required courses in the following minors in Family and Consumer Sciences must be taken for a letter grade and completed with a grade of C or above.

Apparel Design

A minor in apparel design is sponsored jointly by the departments of Family and Consumer Sciences and Art. It is designed to enable students with career interests in this field to gain experience in the competency areas ex-

pected of apparel designers. This minor blends functional, artistic, and fashion considerations in the design of body coverings. Students interested in this minor should consult the sponsoring departments to receive an advisor for the minor. Students must take all courses required for this minor for letter grade and receive a grade of C or above in each course.

Required Courses

FCSC 1170 Introduction to Apparel Construction	3
FCSC 1175 Design Communication	3
FCSC 2175 Fashion Illustration	3
FCSC 2270 Advanced Apparel Construction	3
FCSC 3171 Introduction to Textile Science..	3
FCSC 3174 Flat Pattern Design	3
FCSC 3175 Apparel Design through Draping.....	3

One of the following:

FCSC 1180 Applied Design	3
ART 1120 Foundation: Three Dimension....	3

One of the following:

FCSC 4178/5178 Fiber Arts	3
FCSC 4190 Apparel Collection Development	3

Minor Total 27

Human Development and Family Sciences

A minor in human development and family sciences provides students with a foundation of basic principles and knowledge. The coursework can enrich and complement a student’s primary area of study. Students must complete 22 credit hours outlined below. Students must take courses for letter grade and receive a grade of C or above in each course.

Required Courses

FCSC 2121 Child Development.....	4
FCSC 2131 Family Relationships.....	3
FCSC 2133 Intimate Relationships	3

Plus 12 credit hours from the following:

FCSC 2110 Fundamentals of Aging & Human Development	3
FCSC 3110 Personal Finance.....	3
FCSC 3119 Parent Child Relationships	3
FCSC 3122 Adolescence.....	3
FCSC 3220 Multicultural Influences on Children & Families.....	3
FCSC 4112 Family Decision Making & Resource Management	3
FCSC 4113 Consumer Issues.....	3
FCSC 4117 Understanding Comm. Leadership	3
FCSC 4124 Families of Young Children with Special Needs	3

FCSC 4127 Directing Preschool and Daycare Programs	3
FCSC 4118 Family Policy.....	3
FCSC 4135 Program Evaluation.....	3
FCSC 4138 Family Stress and Coping.....	3
Minor Total	22

Human Nutrition

A minor in human nutrition strengthens degrees in kinesiology and health, food science, nursing, animal science, and related fields. Students who minor in human nutrition learn how food choices can influence their health and well-being. While the coursework provides a foundation for making positive lifestyle choices, it does not prepare students to provide nutrition counseling or medical nutrition therapy. Students must take courses for letter grade and receive a grade of C or above in each course.

Required Courses

FCSC 1141 Principles of Nutrition.....	3
CHEM 2300 Introduction to Organic Chemistry	4
ZOO 3115 Human Systems Physiology.....	4

Plus one of the following:

FCSC 4145 Advanced Nutrition*	4
MOLB 3610 Principles of Biochemistry	4

Plus three of the following:

FCSC 1101 FYS: Human & Environmental Health	3
FCSC 1150 Scientific Study of Food.....	3
FCSC 2141 Nutrition Controversies	2
FCSC 3142 Geriatric Nutrition.....	2
FCSC 3145 Sports Nutrition & Metabolism.	3
FCSC 3147 Community Nutrition.....	3
FCSC 4044 Maternal, Infant and Adolescent Nutrition	3
FCSC 4145 Advanced Nutrition*	4
FCSC 4147 Nutrition and Weight Control....	3

Minor Total 23-25

* Course can be used to fulfill only one category.

Interior Design

A minor in Interior Design is sponsored jointly by the Departments of Family and Consumer Sciences and Civil and Architectural Engineering. It is designed to enable students with career interests in this field to gain experience in the competency areas expected of interior designers. Students who hope to use this minor to prepare for professional certification examination following graduation should consult the sponsoring departments to receive an advisor for the minor. Students must take all courses required for this minor for letter grade and receive a grade of C or above in each course.

Required Courses

FCSC 2188 Interior Design Studio 1	3
FCSC 3288 Environmental Psychology and Inclusive Design	1
FCSC 3171 Introduction to Textile Science .	3
ARE 1600 Architectural Design Studio I	3
ARE 2600 Architectural Design Studio II ...	3

Plus one of the following:

FCSC 3180 Contract Design I	3
FCSC 4188 Contract Design II	3

Plus one of the following:

FCSC 1180 Applied Design	3
ART 1110 Foundation: Two Dimensional ...	3
ART 1120 Foundation: Three Dimensional	3
ARE 3600 Architectural Design Studio III	3

Plus one of the following:

ARE 3030 History of Architecture	3
ART 2020 Art History II.....	3

Minor Total 21

Certification

Early Childhood Program Director’s Certificate

The Early Childhood Program Director’s Certificate is available to early childhood professionals in the state as well as to students. The certificate program is designed to:

- fit Wyoming’s Professional Development Career Lattice,
- fit the National Association for the Education of Young Children’s guidelines for the Preparation of Early Childhood Professionals,
- complement the definition of Quality Child Care developed by the Wyoming Governor’s Council on Early Childhood Development, and
- allow a variety of paths to certification.

The Early Childhood Program Director’s Certificate can be completed as a stand-alone certificate, simultaneously with the distance Professional Child Development undergraduate option or the on-campus Human Development and Family Sciences undergraduate option in Family and Consumer Sciences, or to complement other related degree programs. Courses satisfy certification requirements in many states. They also fit professional development for home providers and daycare professionals.

Those who would benefit from these courses include: Head Start teachers and directors; home providers; Departments of Family Services, Adoption, and Social Service workers; public health nurses; school nurses; directors of school-age child care programs; preschool program teachers, and public school teachers.

The following courses are recommended for this certification. All courses must be taken for letter grade and completed with a grade of C or above.

Required Nutrition Course

FCSC 1141 Principles of Nutrition.....3

Required Early Childhood Program Administration Course

FCSC 4127 Directing Preschool and Daycare Programs3

Choose one of the following Uniqueness and Cultural Awareness courses:

FCSC 3220 Multicultural Influences on Children and Families3

EDEC 5220 Children with Disabilities.....3

EDEC 5240 Evaluation of Young Children with Disabilities3

NURS 3020 Cultural Diversity in Family Health Care3

SOC 2350 Race and Ethnic Relations.....3

Choose one of the following Family Relationships courses:

FCSC 2131 Family Relationships.....3

FCSC 3119 Parent Child Relationships3

FCSC 4124 Families of Young Children with Special Needs3

Choose one of the following Early Childhood Growth and Development courses:

FCSC 2121 Child Development.....4
or

PSYC 2300 Developmental Psychology.....3
and

FCSC 2122 Child Development Lab1

Choose one of the following Health and Safety courses:

FCSC 2050 Safety, Nutrition and Health in Early Childhood Programs.....3

EDEC 4350 Health Management Issues in Early Education3

Choose nine credit hours from the following Early Childhood Methods and Techniques courses:

FCSC 4131 Administrative Internship in Child Development.....6-8

FCSC 4130 Internship in Child Development6-8

EDEC 3000 Observing Young Children.....3

EDEC 3220 School Programs for Young Children3

EDEC 4320 Oral and Written Language Acquisition3

EDEC 5230 Curriculum and Materials for Young Children with Disabilities3

Graduate Study

The department of Family and Consumer Sciences offers a program of study leading to the master of science degree in family and consumer sciences with a concentration in human development and family sciences; human nutrition and food; or design, merchandising and textiles. The department also participates in an interdisciplinary degree in food science and human nutrition.

Program Specific Admissions Requirements

Admission to our graduate program and selection for department-funded assistantships is highly competitive. Faculty in each program area will review the applications for their program area and priority consideration will be given to applicants who meet or exceed admission requirements and possess research interests that parallel those of the faculty.

Admission requirements include:

- A bachelor's degree from an accredited or recognized school is required.
- A grade point average of 3.000 or higher is required.
- A Graduate Record Exam (GRE) score. In the past, successful applicants have typically had scores at or above the 50th percentile on two of the three subtests (verbal, quantitative, and analytical writing).
- For international students whose native language is not English, a minimum TOEFL score of 540 on the written exam or 76 on the Internet-based exam is required. We will also accept an official IELTS score of 6.5 or above.
- International students must also provide evidence of adequate financial resources.

For more information please visit UW's graduate admissions website <http://www.uwyo.edu/uwgrad/>.

Application packets for fall entry are due no later than March 1. Applications may be considered throughout the year if space in a program area is available.

To apply please complete the online application at the UW Office of Admissions application website <http://www.uwyo.edu/admissions/apply-online.html> and submit the following:

- Transcripts from all institutions attended. All transcripts must be official. In order for them to be considered as such, they must be sent directly from the school(s) attended, in a sealed envelope, to UW Admissions.
- Official GRE scores
- Names and contact information for at least 3 people who will provide letters of recommendation about the applicant's preparedness and/or qualifications for the desired graduate degree program
- A statement of purpose (letter of intent) that includes research interests, future goals related to the program of interest, why the applicant is seeking this degree and prior work related experience.
- A brief resume or curriculum vitae
- International applicants must provide official TOEFL or IELTS scores and evidence of adequate financial resources.

For more information, please contact the Department of Family and Consumer Sciences at 307-766-4145 or famconsci@uwyo.edu.

Program Specific Degree Requirements

Master of Science in Family and Consumer Sciences - Plan A (thesis)

Completion of minimum of 30 credit hours including course work and thesis hours.

Completion of research project that adheres to a topic and format previously agreed upon by the student's graduate committee and approved by the department head.

Students may be required to take more than the minimum of 30 hours, either because they have to satisfy prerequisites for some courses, or because a student's committee determines that more than 30 hours will be needed for the student to reach his/her professional objective.

No more than nine hours of 4000-level courses will count toward the 30 hour requirement.

Master of Science in Family and Consumer Sciences - Plan B (non-thesis)

Completion of minimum of 30 credit hours including course work and thesis hours.

Completion of research project that adheres to a topic and format previously agreed upon by the student's graduate committee and approved by the department head.

Students may be required to take more than the minimum of 30 hours, either because they have to satisfy prerequisites for some courses,

or because a student's committee determines that more than 30 hours will be needed for the student to reach his/her professional objective.

No more than nine hours of 4000-level courses will count toward the 30 hour requirement.

Food Science and Human Nutrition Interdisciplinary Degree

Family and consumer sciences faculty participate in an interdisciplinary program that offers a master of science degree in food science and human nutrition. Please see Food Science and Human Nutrition in this catalog for more information.

Family and Consumer Sciences (FCSC)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

1009. Introduction to Family and Consumer Sciences. 1-3. Introduction to Family and Consumer Sciences is an introductory course for high school students directed by faculty and extension educators. Topics include human nutrition and food; human development and family sciences; and textiles, design, merchandising and textiles.

1101. First-Year Seminar. 3. [(none)♦FYS]

1141. Principles of Nutrition. 3. This course will provide an introduction to the fundamental concepts of nutrition science and the role of nutrition in overall health. Students develop an understanding of nutritional requirements as related to metabolism of nutrients in various physiological states. Designed for nutrition majors and interested non-majors.

1150. Scientific Study of Food. 3. Comprehensive introduction to the study of food. Food science theories relative to composition are applied through the laboratory experiences.

1170. Introduction to Apparel Construction. 3. Introduction to basic and industry production techniques applied to apparel and interior products. Development of decision-making skills in selection and use of materials.

1175. Design Communication. 3. Explores philosophical and practical factors of the design communication process. Incorporates various methods of communicating design ideas and concepts from hand drawing and rendering to digital techniques through Adobe Creative Suite.

1180. Applied Design. 3. [CA♦H] A study of design principles and elements and their relation to the design of marketable consumer

goods. Emphasizes developing creative thinking and proper fabrication techniques in solving both 2-D and 3-D design problems.

1185. Introduction to Design, Merchandising and Textile Industry. 3. Introduction to the functions of the design, merchandising and textiles industry. This course will give a base of knowledge of the industry including textile and garment production and manufacturing, design processes for apparel and interiors, and retailing. Students will also be introduced to potential career paths within the industry.

2050. Safety, Nutrition and Health in Early Childhood Programs. 2. Designed to enrich students' understanding of practices which support children's health development. Issues to be explored include record keeping related to child care health and safety, use of health consultants, accident and injury prevention, immunizations, nutrition and food safety in child care settings. (Offered alternate summers.)

2101. Special Topics In.: 1-3 (Max. 6). Provides freshman and sophomore level undergraduate students opportunities to pursue a class of special interest or of a timely subject in a selected family and consumer sciences area and for faculty to pilot lower division courses.

2110. Fundamentals of Aging and Human Development. 3. Discusses aging as a lifelong process, involving interrelationships of the individual and his or her environment. Includes future demographic trends, family health care, social policy and mass media. *Prerequisite:* PSYC 1000 or SOC 1000.

2121. Child Development. 4. [CS♦(none)] Incorporates classroom instruction with laboratory application of child development research and theory in physical, intellectual and social/emotional domains. Emphasizes early childhood years. *Prerequisite:* PSYC 1000 or SOC 1000 or EDST 2450.

2122. Child Development Lab. 1. Laboratory observation course designed for students with a background in child development theory. Students learn child observation techniques, how to write laboratory reports, and how to apply them to evaluating a child's development in all domains. *Prerequisite:* PSYC 2300.

2131. Family Relations. 3. Provides an overview of current research on family relations, family theory, and family dynamics across the lifespan. An ecological and family systems approach is used, with particular focus paid to the understanding of contextual influences on families. *Prerequisites:* COJO 1030 or EDEC 1020 or PSYC 1000 or SOC 1000.

2133 [3133]. Intimate Relationships. 3. Use of social science theory and research to understand psycho-socio-cultural influences in the development of personal and intimate relationships including human sexuality from development and interpersonal perspectives. Emphasizes application of current research and theory to facilitate positive individual growth, satisfaction, and stability in close relationships. *Prerequisites:* PSYC 1000 or SOC 1000.

2135. Women and Aging. 3. Focuses on women and the aging process with emphasis given to both the problems and promises of aging. Topics to be explored within a multicultural, sociological framework include the definition of self, relationships, community, health and health care, work and service, retirement, economic realities and new perspectives on aging. Cross listed with WMST/SOC/NURS 2135. *Prerequisites:* ENGL/SOC/WMST 1080 or SOC 1000 or FCSC/NURS/SOC 2120.

2141. Nutrition Controversies. 2. This course expands upon nutrition concepts covered in FCSC 1141 by exploring current nutrition-related controversies. Skills related to the interpretation of research literature will be emphasized. *Prerequisite:* FCSC 1141.

2165 [1165]. Introduction to Fashion and Dress. 3. [(none)♦H] Course explores the system of dress, from body to garment selection, and the influences of psychology, culture and subculture on dress and self-presentation. Topics discussed include body image, society and social control, norms and dress outside the western world. Course will conclude by exploring current designers.

2175. Fashion Illustration. 3. Introduces the fashion figure, light and dark contrasts, color, fabric and texture sketching techniques. Computer applications for layout of the design are also covered. *Prerequisites:* FCSC 1180 or ART 1110; FCSC 1175. (Offered alternate fall semesters)

2180. Housing and Residential Design. 3. Cross-cultural examination of the evolution of housing and residential design, both as artifacts of material culture, and as the setting which affects human development and well-being. Explores implications of housing construction on economic, social, and environmental health. Studies effective research and design of residential spaces in response to course concepts. *Prerequisite:* WA/COM1.

2185. Trend Forecasting and Analysis. 3. This course introduces concepts and techniques for color, textile, interior and fashion trend forecasting. Students will learn how to recognize current trends in lifestyle and

ready-to-wear as well as signals for predicting forthcoming trends which impact retail merchandising and marketing decisions.

2188. Interior Design Studio I. 3. Beginning interior design course in which students practice design principles and the design process to create functional, sustainable, and aesthetically pleasing residential interior spaces. Explores effective space planning and innovation for small footprint spaces. Emphasizes design development through hand drawing and rendering techniques. Sophomore standing or consent of instructor. *Prerequisite:* FCSC 1180 or consent of instructor.

2200. Professionalism and Communication in FCSC. 3. [(none)◀COM2] An introduction to the field of Family and Consumer Sciences. Students will learn the history and approaches to problem solving using the body of knowledge in the field. The course will focus on professionalism and communication strategies using our departmental competencies. *Prerequisites:* FCSC major, FYS and COM1.

2210. Fashion Show Event Planning. 2. Provides students with a real-world, integrative experience with planning a large-scale special event, specifically, a fashion show. Opportunities include garment and model acquisition and organization, production (music planning, scheduling judges, MCs and guest speakers), promotion, budgeting and stage/runway design. Students experience the entire process of planning, setup and execution.

2270 [3170]. Advanced Apparel Construction. 3. Development of advanced apparel construction and tailoring techniques. Continued development of decision-making skills in selection, use and evaluation of materials. *Prerequisite:* FCSC 1170.

3110. Personal Finance. 3. Acquaints students with personal budgeting and financial matters and relate these activities to financial institutions involved. *Prerequisite:* junior standing.

3119 [4119]. Parent-Child Relationships. 3. Provides an overview of research and theory related to the processes of parent-child relationships across the lifespan. Emphasizes developmental and family theory and contexts that influence parent-child relationships. Introduces parent education as a method for applying parenting scholarship to professional practice. *Prerequisite:* PSYC 1000 or FCSC 2121 or EDST 2450.

3122 [4122]. Adolescence. 3. Studies biological, cognitive, and social/emotional development and adjustment within the adolescent and emerging adulthood years. Emphasis on the importance of theoretically grounded re-

search and the integration of theory, research, and practice during adolescence. *Prerequisite:* PSYC 1000.

3129. Social Development in Young Children. 3. Designed to provide professional child development and early childhood education majors with an opportunity to learn more about how to encourage healthy social development in young children. In addition, topics of self-esteem, emotional regulation, and secure attachment will be discussed in depth with regards to how they affect overall development. *Prerequisite:* FCSC 2121 or PSYC 2300.

3142 [4142]. Geriatric Nutrition. 2. Studies nutrition requirements in elderly as effected by physiological changes with aging and the impact of nutrition and healthy lifestyle on prevention and treatment of age related conditions, diseases and social issues. *Prerequisites:* FCSC 1141; LIFE 1010.

3145. Sports Nutrition and Metabolism. 3. Discusses roles played by carbohydrate, fat, protein, water, and key vitamins and minerals as they relate to physical exercise. Applies principles of nutrition. *Prerequisites:* FCSC 1141; ZOO 3115.

3147. Community Nutrition. 3. Provides an introduction to the field of community nutrition and develops an appreciation of the importance of nutrition in community health programs at the local, state, national, and international level. Topics covered include the role of the community nutritionist; the identification of nutrition problems; food insecurity; nutrition policy; nutrition education; assessing community resources; and program planning and evaluation. *Prerequisites:* FCSC 1141; SOC 1000 or 1100.

3150. Intermediate Foods. 2. Examines food management concepts in regards to the service of safe food, modified menu development, and understanding of federal food regulations for food and nutrition labelling. *Prerequisites:* FCSC 1150; CHEM 1020; MOLB 2021; junior standing and FCSC majors and minors.

3152 [4152]. Food Systems Production. 3. Quantity food purchasing and production, along with institutional food services experience. *Prerequisites:* FCSC 3150 and LIFE 1010.

3160. Merchandise Retailing and Buying. 3. Provides students with the knowledge involved in the buying function of the merchandising and retailing process, including merchandise planning and retail math. Gives students the necessary skills to pursue a career in retail buying. *Prerequisites:* FCSC 2185 and MATH 1000 or MATH 1400.

3171 [2171]. Introduction to Textile Science. 3. [(none)◀PN] Textiles are part of your everyday life. This course introduces fiber and

polymer manufacturing, fiber properties, yarn properties, yarn manufacturing, fabric properties, fabric manufacturing, and coloration/finishing of textile materials. Understanding of the science behind fabric and clothing care instructions, quality indicators and new developments on the horizon for textiles will be gained. *Prerequisite:* Completion of USP Q requirement.

3173 [4173]. Visual Merchandising and Promotion. 3. Principles of visual merchandising, consumer behavior for effective promotions, and selling techniques are discussed. Topics include brand development, advertising, visual display, publicity, fashion shows, special events, store space planning and layout. Students will have hands-on experience with several techniques. *Prerequisites:* FCSC 1180 and FCSC 2188. (Offered alternating fall semesters, odd years)

3174 [4170]. Flat Pattern Design. 3. Principles and instructions for drafting and hand grading patterns using slopers through standard or individual measurements. Techniques of garment design are learned to create three-dimensional designs using the flat pattern method. *Prerequisites:* FCSC 2175 and 2270. (Offered alternate spring semesters)

3175. Apparel Design Through Draping. 3. Draping garment patterns through fabric manipulation, molding, and shaping to create three-dimensional form utilizing couture construction techniques. *Prerequisite:* FCSC 3174.

3180. Contract Design I. 3. Interior design course focused on designing sustainable contract spaces primarily for the hospitality industry. As needed, other public space design may be explored. Design development and communication through advanced design and rendering software will be utilized. Students will learn to write specifications and practice design development through evidence based design. *Prerequisites:* FCSC 2188 and FCSC 3288 or concurrent enrollment, or consent of instructor.

3184. Foundations of Merchandising I. 3. Planning, developing, and presenting product line(s) for identified target market(s) in relation to pricing, assortments, styling and timing. Concepts of supply chain business systems. *Prerequisite:* ECON 1010. (Offered alternate fall semesters)

3185. Product Development Through Design Thinking. 3. Students will expand their understanding of design and the strategies utilized to bring desirable and human-centered products to market. Techniques and skills for developing textile, interior and apparel products will be discussed. Students will gain

understanding and recognition of the elements of design through product analysis. *Prerequisite:* FCSC 1180.

3188. Interior Design Studio II. 3. Building upon skills developed in ID Studio 1, students will gain advanced knowledge of lighting, building codes and systems, specifications, materials, and space planning through more complex residential design problems. Design thinking and human centered design are emphasized. Explores design development and communication through CAD based and hand rendering techniques. *Prerequisite:* FCSC 2188.

3220. Multicultural Influences on Children and Families. 3. [CS,D◀H] Designed to enrich students' understanding of cultural contexts of children and families. Issues to be explored will include cultural values, learning styles, acquisition of concepts of race and ethnicity, bi-lingualism, the theory of bicultural/bicognitive development, and effective communication and problem-solving strategies that apply in multiple professional settings. *Prerequisite:* FCSC 2121 or PSYC 2300 or FCSC 2131.

3288. Environmental Psychology and Inclusive Design. 1. Online design primer focused on preparing students for the contract interior design series. Explores how humans interact with, experience, and behave in public spaces. Advances understanding of design inclusivity by interpreting and applying ADA regulations, along with considerations for diverse ages, circumstances, and abilities. *Prerequisite:* FCSC 2188 or FCSC 2180.

4044 [3140]. Maternal, Infant and Adolescent Nutrition. 3. Addresses nutrition requirements prior to and during pregnancy and lactation and continuing through infancy and adolescents and the physiological and endocrine changes influencing such requirements. Discusses dietary patterns and practices and the importance of healthy lifestyles during these periods for disease prevention and treatment. Dual listed with FCSC 5044. *Prerequisites:* FCSC 1141; LIFE 1010; ZOO 3115.

4104. Field Studies in Family and Consumer Sciences. 1-3 (Max. 3). Concentrated on-site study of family and consumer sciences-related businesses, agencies and organizations to better understand challenges and potentials of various career opportunities in family and consumer sciences. *Prerequisite:* junior standing. (Offered based on sufficient demand and resources)

4105. Family and Consumer Sciences Internship. 6-8 (Max. 8). Gives students experience in workplace related to selected family and consumer sciences options (i.e., retail store, social service agency and preschool

or day care). *Prerequisites:* junior standing in family and consumer sciences and consent of instructor.

4106. Special Problems in Family and Consumer Sciences. 1-3 (Max. 8). Provides advanced undergraduate students opportunities to pursue a topic of special interest in a selected family and consumer sciences area, under guidance of a department faculty member. *Prerequisites:* junior or senior standing and advanced consultation with department head and an instructor in subject matter area.

4112. Family Decision-Making and Resource Management. 3. Utilizes theories to facilitate understanding of problem-solving and resource management in various family structures/context across the life span. Emphasizes internal family dynamics, global interdependence, critical thinking, cultural examination, ethical decision-making, and self-reflection. Dual listed with FCSC 5112. *Prerequisites:* PSYC 1000 or SOC 1000 or COJO 1030 or 1040; WB/COM2.

4113. Consumer Issues. 3. Provides research/applied understanding of consumer rights/responsibilities, government/business roles, legislation, advocacy, and redress. Emphasizes introductory consumer law/legal research, critical thinking, self-reflection, and cultural examination. Ethical theories and issues examined within an interdependent world. Meets requirements for certification in family and consumer sciences education. Internship opportunities possible upon successful completion. Companion web site used. *Prerequisites:* ECON 1000 or SOC 1000 or PSYC 1000; WB/COM2.

4117. Understanding Community Leadership. 3. [CS◀(none)] Understanding Community Leadership. Introduces students to the scope and functions of professionals working in rural communities as leaders. Students will explore community dynamics, leadership skills and managing change, and understand the complexities of leadership within communities. Understanding communities and leadership increases the likelihood of success for community based professionals. Dual listed with FCSC 5117. *Prerequisites:* senior standing and satisfactory completion of a WB/COM2 course.

4118. Family Policy. 3. Explores the relationships between public programs/policies/laws and family functioning. The roles of family professionals in advocacy and education regarding policies will be discussed. Attention will be paid to current events relevant to family

policy issues and the policy process at the state level. Dual listed with FCSC 5118. *Prerequisites:* FCSC 2131; junior standing.

4124. Families of Young Children With Special Needs. 3. Deals with importance of including family in the process of early intervention with the preschool child with special needs. *Prerequisites:* FCSC 2121 or PSYC 2300; junior standing.

4125. Professional Practices in Human Development and Family Sciences. 3. Explores key professional and ethical issues related to professional practice in Human Development and Family Sciences. Reviews Family Life Education history, purpose, and methodology. Emphasizes skills and knowledge needed to work in various settings with individuals and families across the lifespan. This class is a prerequisite for HDFS student internships (FCSC 4130; FCSC 4131; FCSC 4132). *Prerequisites:* FCSC 2110, FCSC 3119, FCSC 3122, FCSC 3220 AND FCSC 2131. (Offered fall semester only)

4127. Directing Preschool and Daycare Programs. 3. [WC◀(none)] Effective methods for establishing and operating preschool and day-care programs for children under six years of age. Includes programming, classroom management, parent involvement and administration of food and nutrition programs. *Prerequisites:* FCSC 2121, EDEC 1020 or 3210; junior standing.

4130. Internship in Child Development. 6-8 (Max. 8). Provides professional child development and early childhood education majors with an in-depth experience working with children from birth to age five. Students gain experience including planning lessons, teaching, assessing children and conducting parent conferences. *Prerequisites:* FCSC 2121; EDEC 3000; EDEC 3220; senior standing.

4131. Administration Internship in Child Development. 6-8 (Max. 8). Provides professional child development and early education majors with an in-depth experience working with families and staff. Students gain experience in observing and assessing early childhood programs, planning and presenting staff trainings/professional workshops, staff supervision, writing newsletters, and other professional documents and professional activities. *Prerequisites:* FCSC 2121; FCSC 4127; senior standing.

4132. Internship in Human Development and Family Sciences. 6-8 (Max. 8). Acquire skills and gain familiarity in direct services, policy development, or program planning in a human services agency/organization. Opportunities to apply theories and knowledge gained in classroom settings to professional

practice will be provided. *Prerequisites:* FCSC 4125; consent of instructor; senior standing. (Offered spring and summer semesters only)

4135. Program Evaluation. 3. Explores techniques for evaluating programs in the public and/or private sectors. Includes determining need, identifying/communicating with stakeholders, developing program theory/logic models, implementation, evaluation methods/instruments, and interpreting/reporting evaluation results. Dual listed with FCSC 5135. *Prerequisites:* Junior standing.

4138. Family Stress and Coping. 3. Theoretical and empirical research on family stress, coping and resiliency is emphasized as well as the study of normative stressors and crisis in the lives of individuals and families. Attention is paid to the application of theory and research to professional practice. Dual listed with FCSC 5138. *Prerequisites:* FCSC 2131; junior standing.

4145. Advanced Nutrition. 4. Discusses functions of components of diet in human metabolism. Applies principles of nutrition. Dual listed with FCSC 5145. *Prerequisites:* FCSC 1141; ZOO 3115. (Offered fall semester)

4147. Nutrition and Weight Control. 3. Advanced course in physiological and metabolic determinants of weight control emphasizing pathology, psychodynamics, assessment and treatment of obesity. Dual listed with FCSC 5147. *Prerequisites:* FCSC 1141; ZOO 3115.

4150. Experimental Foods. 3. Studies physical and chemical properties of raw and processed food materials and tests for evaluation of food quality. Students develop ability to use and interpret recent research findings, as well as skills in planning, conducting and reporting food experiments. *Prerequisites:* FCSC 1150, CHEM 2300, STAT 2020, ENGL 4010, FCSC major.

4160. Merchandising Strategies and Technology. 3. Students will be exposed to advanced merchandising strategies for retail buying and planning. Technologies used for gathering pertinent retail data, such as foot traffic and inventory management software, will be introduced. Course will expand on concepts introduced in prerequisite coursework. *Prerequisite:* FCSC 3160.

4171. Advanced Textiles and Product Evaluation. 3. Coloration is a key determinant in consumer textile purchases. This course introduces color science, dye properties and application and colorfastness evaluation. Quality control, testing standards, laboratory tests and specifications and how they are used to evaluate textiles products will also be discussed. Dual listed with: FCSC 5171. *Prerequisites:* FCSC 3171 and concurrent enrollment in FCSC 4172.

4172. Advanced Textiles and Product Evaluation Lab. 1. Practical application of various textile science and quality assurance tests discussed in FCSC 3171 and FCSC 4171. Basic and advanced levels of testing on products in different stages of manufacture conducted. Students will use select test results to generate product specifications. Dual listed with FCSC 5172. *Prerequisites:* FCSC 3171 and concurrent enrollment in FCSC 4171.

4174. Foundations of Merchandising II. 3. A review of the fashion industry including types of fashion retail and the use of technology in retail sales. Exploration of merchandising/retailing principles, and the formulas and calculations essential to these principles. *Prerequisite:* MATH 1400.

4176. Historic Clothing. 3. Surveys history of clothing in the Western World. Includes information from approximately 3000 B.C. through the 20th century. Dual listed with FCSC 5176. *Prerequisite:* FCSC 1165. (Offered alternate spring semesters)

4178. Fiber Arts. 3 (Max 6). Development and enhancement of technical and creative apparel design skills with a focus on embellishment techniques and creative pattern-making culminating in the creation of a distinctive piece of wearable art. Dual listed with FCSC 5178. *Prerequisite:* FCSC 3174 or FCSC 3175.

4181. Global Trade and Sourcing for Textile Products. 3. [G◀(none)] Discusses global textile industry, how the U.S. fits into the global industry, textiles and apparel trade policy, as well as balancing conflicting interests in the world marketplace. Dual listed with FCSC 5181. *Prerequisite:* FCSC 1185. (Offered spring semester odd years)

4182. Environmental Sustainability in Design, Merchandising and Textiles. 3. [WC◀COM3] Examines the environment, the impact of the textile industry on the environment, and issues facing the textile industry to provide more environmentally friendly products. Dual listed with FCSC 5182. *Prerequisite:* completion of USP WB/COM2 requirement. (Offered alternate spring semesters)

4185. Product Development and Technology. 3. This course introduces students to various technologies used to bring products to market. 3-D body scanning, computer apparel pattern digitizing, grading, marker making and repeats for digitally-printed, knit and woven fabrics will be discussed. Students will complete product technical packages based on product specifications. *Prerequisites:* FCSC 3185, FCSC 4171, and FCSC 4172.

4188. Contract Design II. 3. Explores space planning and design as applied to contract interiors. Focused on healthcare and corporate design, but may survey other public spaces as appropriate. Advanced design, rendering, and visualization software used to conceptualize and present design solutions. Sustainable, accessible and functional design is highlighted. Dual listed with FCSC 5188. *Prerequisite:* FCSC 2188 and FCSC 3288 (or concurrent enrollment), or consent of instructor.

4190. Apparel Collection Development. 3. Students will utilize their pattern-making and apparel construction skills and continue to expand their knowledge of fit on live models through creation of their own apparel collection. They will be responsible for the creation of the collection from inspiration to final product. Collections will be showcased through a real-world fashion show. *Prerequisite:* FCSC 3174 or FCSC 3175.

4210. Therapeutic Nutrition I: Nutrition Assessment and Diagnosis. 4. Nutrition assessment and diagnosis as part of the nutrition care process; experience in dietary and nutrient assessment of the apparently healthy and sick individual with discussion of case studies. Dual listed with FCSC 5210. *Prerequisites:* ZOO 3115, MOLB 3610, and FCSC 4145 or concurrent enrollment.

4220. Therapeutic Nutrition II. 4. Rationale for dietary modifications in pathological conditions; experience with learning and applying the nutrition care process to develop nutrition care plans for individuals with various medical conditions with discussion of case studies. Dual listed with FCSC 5220. *Prerequisite:* MOLB 4100.

4230. Therapeutic Nutrition Counseling. 2. Course is designed to help students develop basic nutrition counseling and communication skills. Students will learn how to apply the concepts learned during lecture through interactive classroom experiences with peers and outside of the classroom experiences with an assigned client. *Prerequisites:* FCSC 4220 or concurrent enrollment; Dietetics students only.

4288. Professional Practice and Advanced Interiors Studio. 4. Explores standards of practice, project management, contract documents, portfolio development, and professional ethics and conduct in interior design. Studio based projects are focused on creating residential or contract designs through collaboration and integrated practice with interdisciplinary teams, and/or designs created for clients through service based learning. Dual listed with FCSC 5288. *Prerequisite:* FCSC 3180 or FCSC 4188.

4346. Clinical Practicum in Dietetics. 1. Concentrated clinical practicum designed to provide dietetic majors with experience in the institutional, practitioner and clinical settings. *Prerequisite:* FCSC 4220 and permission of instructor. Enrollment is limited to dietetics students only.

4960. International Study Tour FCS. 1-3 (Max. 6). Designed to provide students with an opportunity to learn more about food, design, and human services in international settings. Students will visit locations relevant to the Family and Consumer Science discipline. *Prerequisite:* consent of instructor. (Offered based on sufficient demand and resources every other spring/summer term, odd years; international destinations vary)

4970. Design and Merchandising Internship. 3 (Max. 6). Provides practical experience in retail, interior design or apparel design settings. *Prerequisite:* junior standing or consent of instructor.

4985. Seminar: Development in Community Leadership. 2-3. Emphasizes basic core components of individual leadership: assessment of leadership skill and style; community-based experiences for understanding of community and resources; group community development projects for students; engagement with others and the community. Upon completion, students understand various leadership styles and philosophies and articulate their personal leadership philosophy. Dual listed with FCSC 5985. *Prerequisites:* senior or post-graduate equivalent status and consent of instructor.

5044. Maternal, Infant and Adolescent Nutrition. 3. Addresses nutrition requirements prior to and during pregnancy and lactation and continuing through infancy and adolescents and the physiological and endocrine changes influencing such requirements. Discusses dietary patterns and practices and the importance of healthy lifestyles during these periods for disease prevention and treatment. Dual listed with FCSC 4044. *Prerequisite:* graduate standing.

5101. Special Topics in Family and Consumer Sciences. 1-3 (Max. 6). Intended to accommodate a seminar series and a course offering by visiting faculty whose subject matter is not included in other course offerings.

5102. Special Problems. 1 - 12 (Max. 18). Study in a selected problem area for broader perspective or greater specialization in the student program. *Prerequisite:* advanced or graduate standing and consultation with department head and instructor in subject matter area.

5103. Graduate Seminar in Family and Consumer Sciences I. 1. Integrative Seminar in Family and Consumer Sciences. Students are exposed to faculty research, discuss common readings and present their own research. Offered S/U only for those taking Graduate Seminar I and students will be taking Graduate Seminar II for a letter grade. *Prerequisite:* graduate student standing.

5104. Graduate Seminar in Family and Consumer Sciences II. 1. Integrative seminar in Family and Consumer sciences. Students are exposed to faculty research, will discuss common readings, and will present their own research. Graduate Seminar II can only be taken for a letter grade. *Prerequisite:* FCSC 5103.

5107. Family and Consumer Sciences Extension Practicum. 8. To provide experience in county extension programs. *Prerequisites:* AGRI 4010, advanced standing and consent of instructor.

5112. Family Decision and Resource Management. 3. Utilizes theories to facilitate understanding of problem-solving and resource management in various family structures/ contexts across the life span. Emphasizes internal family dynamics, global interdependence, critical thinking, cultural examination, ethical decision-making, and self-reflection. Designed to meet family studies requirement for license in marriage and family therapy at graduate level. Companion website used. Dual listed with FCSC 4112. *Prerequisites:* graduate standing.

5117. Understanding Community Leadership. 3. Understanding Community Leadership. Introduces students to the scope and functions of professionals working in rural communities as leaders. Students will explore community dynamics, leadership skills and managing change, and understand the complexities of leadership within communities. Understanding communities and leadership increases the likelihood of success for community based professionals. Dual listed with FCSC 4117. *Prerequisite:* graduate standing.

5118. Family Policy. 3. Explores the relationships between family functioning and public/private policies. The roles of family professionals in advocacy and education regarding policies are discussed. Attention is paid to the policy process at the state level. Dual listed with FCSC 4118. *Prerequisite:* graduate standing.

5120. Infancy and Toddlerhood. 3. Examines development and behavior, focusing on a broad range of topics which includes: physical development, prenatal influences, sensory processes, biological factors, cognitive development, language development, social interaction

and relationship. A broad family and consumer sciences perspective (the family in its environment) are applied. *Prerequisite:* FCSC 2121 or equivalent course in child development.

5121. Ethics in Research and Professional Practice. 3. Includes ethical theories, responsible conduct of research and professional practice defined by government, professional organizations, journals, and employers. Concepts include plagiarism, fabrication, falsification, conflict of interest, and conflict of commitment, and institutional review boards protecting human subjects. Concepts will be applied to research and professional practice in different settings. *Prerequisite:* acceptance into a graduate program.

5122. Developmental Contexts Across the Lifespan. 3. A variety of contexts in which children, adults, and families live and develop. Attention is given to the constant interactions that occur between humans and their environments, as well as how different environments may foster or hinder development. Includes discussions of the practical, professional and political implications of contextual research. *Prerequisite:* graduate standing.

5123. Positive Youth Development. 3. This course explores positive youth development (PYD), or the understanding and promotion of the well-being and health of youth. In this course, we will examine PYD theory and frameworks, research regarding how to best assess and foster PYD, and interventions designed to promote PYD and associated outcomes. *Prerequisite:* graduate standing.

5135. Program Evaluation. 3. Explores techniques for evaluating programs in the public and/or private sectors. Includes determining need, identifying/communicating with stakeholders, developing program theory/logic models, implementation, evaluation methods/instruments, and interpreting/reporting evaluation results. Dual listed with FCSC 4135. *Prerequisites:* Graduate standing.

5138. Family Stress/Coping. 3. Theoretical and empirical research on family stress, coping and resiliency is emphasized as well as the study of normative and nonnormative stressors and crises in the lives of families. Attention is paid to professional practice applications. Dual listed with FCSC 4138. *Prerequisite:* graduate standing.

5140. Nutritional Aspects of Proteins and Amino Acids. 3. Advanced study of protein and amino acid metabolism in various physiological conditions. *Prerequisites:* MOLB 3610 or equivalent; FCSC 4145 or equivalent.

5141. Carbohydrate and Ethanol Metabolism. 3. Advanced study of carbohydrate and ethanol metabolism in various physiological conditions. *Prerequisites:* MOLB 3610 or equivalent and FCSC 4145 or equivalent.

5145. Advanced Nutrition. 4. Discusses functions of components of diet in human metabolism. Applies principles of nutrition. Dual listed with FCSC 4145. *Prerequisite:* graduate standing.

5147. Nutrition and Weight Control. 3. Advanced course in physiological determinants of weight control emphasizing pathology, psychodynamics, assessment, and treatment of obesity. Dual listed with FCSC 4147. *Prerequisite:* graduate standing.

5151. Sensory Analysis. 1. Examines the principles and techniques applied to the subjective evaluation of food. *Prerequisites:* graduate standing; STAT 5080.

5171. Advanced Textiles and Product Evaluation. 3. Coloration is a key determinant in consumer textile purchases. This course introduces color science, dye properties and application and colorfastness evaluation. Quality control, testing standards, laboratory tests and specifications and how they are used to evaluate textiles products will also be discussed. Dual listed with: FCSC 4171. *Prerequisite:* graduate standing.

5172. Advanced Textiles and Product Evaluation Lab. 1. Practical application of various textile science and quality assurance tests discussed in FCSC 3171 and FCSC 4171. Basic and advanced levels of testing on products in different stages of manufacture conducted. Students will use select test results to generate product specifications. Dual listed with FCSC 4172. *Prerequisite:* graduate standing.

5173. Textile Science Seminar. 3. Advanced study of textile science, physical and chemical modification of fibers, developments in dyeing and finishing technology. Environmental aspects of textile technology. Extensive use of current literature is utilized.

5176. Historic Clothing. 3. Surveys history of clothing in the Western World. Course content includes information from approximately 3000 BC through the 20th century. Dual listed with FCSC 4176. *Prerequisite:* graduate standing. (Offered alternate spring semesters)

5178. Fiber Arts. 3. Development and enhancement of technical and creative apparel design skills with a focus on embellishment techniques and creative pattern-making culminating in the creation of a distinctive piece of wearable art. Dual listed with FCSC 4178. *Prerequisite:* graduate standing.

5179. Historic Textiles. 3. History of all major textile industries is explored. Processes and technical terms are explained. The role and impact of textiles in western economies and societies are examined. *Prerequisite:* graduate standing. (Offered alternate fall semesters)

5181. Global Trade and Sourcing for Textile Products. 3. Discusses global textile industry, how the U.S. fits into the global industry, textiles and apparel trade policy, as well as balancing conflicting interests in the world marketplace. Dual listed with FCSC 4181. *Prerequisite:* graduate standing. (Offered alternate spring semesters)

5182. Environmental Sustainability in Design, Merchandising and Textiles. 3. Examines the environment, the impact of the textile industry on the environment, and issues facing the textile industry to provide more environmentally friendly products. Dual listed with FCSC 4182. *Prerequisite:* graduate standing. (Offered alternate spring semesters)

5188. Contract Design II. 3. Explores space planning and design as applied to contract interiors. Focused on healthcare and corporate design, but may survey other public spaces as appropriate. Advanced design, rendering, and visualization software used to conceptualize and present design solutions. Sustainable, accessible and functional design is highlighted. Dual listed with FCSC 4188. *Prerequisite:* graduate standing.

5210. Therapeutic Nutrition I: Nutrition Assessment and Diagnosis. 4. Nutrition assessment and diagnosis as part of the nutrition care process; experience in dietary and nutrient assessment of the apparently healthy and sick individual with discussion of case studies. Dual listed with FCSC 4210. *Prerequisites:* graduate standing and permission of instructor.

5220. Therapeutic Nutrition II. 4. Rationale for dietary modifications in pathological conditions; experience with learning and applying the nutrition care process to develop nutrition care plans for individuals with various medical conditions with discussion of case studies. Dual listed with FCSC 4220. *Prerequisite:* graduate standing.

5230. Therapeutic Nutrition Counseling. 4. Students will develop basic nutrition counseling and communication skills. Students will learn how to apply the concepts learned during lecture through interactive classroom experiences with peers and outside of the classroom experiences with an assigned client. Dietetics students only. Dual listed with FCSC 4230. *Prerequisite:* graduate standing or permission of instructor.

5288. Professional Practice and Advanced Interiors Studio. 4. Explores standards of practice, project management, contract documents, portfolio development, and professional ethics and conduct in interior design. Studio based projects are focused on creating residential or contract designs through collaboration and integrated practice with interdisciplinary teams, and/or designs created for clients through service based learning. Dual listed with FCSC 4288. *Prerequisite:* graduate standing.

5890. Seminar in Food Science and Nutrition. 1. A seminar course on topics in food science and human nutrition. Cross listed with FDSC 5890. *Prerequisite:* graduate standing.

5900. Practicum in College Teaching. 1-3. (Max 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrollment in a graduate degree program.

5985. Development of Community Leadership. 2-3 (Max 98). Emphasizes basic core components of individual leadership: assessment of leadership skill and style; community based experiences for understanding of community and resources; group community development projects for student engagement with others and the community. Upon completion of course, students will understand various leadership styles and philosophies and articulate their personal leadership philosophy. Dual listed with FCSC 4985. *Prerequisites:* senior or post graduate equivalent status and consent of instructor.

Life Sciences Program

107 Aven Nelson Building,
(307) 766-4158

Web site: www.uwyo.edu/lifescience

Program Director: Jonathan Prather

The Life Sciences Program consists of all LIFE prefix courses. These courses support a wide range of life science majors and several non-life science majors across campus. The number of LIFE courses taken by students in each major is determined by the departments that offer the majors. The curriculum intends to provide science majors with both breadth and depth in the basic life sciences, and non-science majors with exposure to key concepts in biology and an understanding of the connections between science and society. The program courses also expose students to the fields of cell and molecular biology, genetics, ecology, and evolution, and they familiarize students with the diversity of life on the planet. Courses within the curriculum address four fundamental goals at a level appropriate for each course: 1) Acquisition, Application and Synthesis of Knowledge, 2) Communication Skills, 3) Critical Thinking and Problem Solving, and 4) Research Skills.

For information on LIFE course offerings, please refer to the Life Sciences Program entry in the College of Arts and Sciences.

Microbiology Program

5004 Agriculture Building, (307) 766-3139

FAX: (307) 766-3875

E-mail: gandrews@uwyo.edu

Program Director: Dr. Gerard Andrews

The bachelor of science degree program in microbiology is organized as an interdepartmental major involving the collaborative teaching, advising, and research expertise of more than 20 microbiology faculty from the Colleges of Agriculture, Arts and Sciences, and Health Sciences. The program is administered by a program director and a coordinating committee which represent each of the participating colleges. Students obtain their degree in the College of Agriculture and Natural Resources. Students should contact the program director or members of the coordinating committee directly for more information or formal academic advising within the program. Additional information about the microbiology program may be obtained at the following web site address: www.uwyo.edu/agcollege/micro/microhome.htm.

Students pursuing a major in microbiology must be advised by one of the following participating faculty members of the interdepartmental Microbiology Steering Committee:

GERRY ANDREWS, Veterinary Sciences
BERIT BANGOURA, Veterinary Sciences
BLENDAR BISHA, Animal Sciences
BRIDGET DECKER, Molecular Biology
JASON GIGLEY, Molecular Biology
MARK GOMELSKY, Molecular Biology
MYRNA MILLER, Veterinary Sciences
BRANT SHUMAKER, Veterinary Sciences
KERRY SONDEGROTH, Veterinary Sciences
HOLLY STEINKRAUS, Molecular Biology
LINDA VAN DIEPEN, ESM
DANIEL WALL, Molecular Biology
RACHEL WATSON, Chemistry
JOHN WILLFORD, Molecular Biology

Microbiology is the study of life forms too small to be observed without the aid of magnification; major groups of microbes include the bacteria, fungi (yeasts and molds), protozoa, and algae, as well as the viruses. In addition, related disciplines such as immunology and molecular biology are included because of their historical origins within microbiology.

As such, the science of microbiology is divided into numerous subspecialty areas that reflect not only the individual groups of microbes (e.g., bacteriology, virology, mycology, etc.), but also their significance in applied areas (e.g., medical microbiology/infectious diseases, microbial ecology, food microbiology, industrial microbiology, biotechnology, etc.) or in areas of basic science (e.g., molecular genetics). Throughout its history, microbiology has played a key role in the development of our understanding of basic biochemical and genetic processes, control of infectious diseases, production of increased and improved food supplies, and the production of numerous commercial products. With the development of molecular techniques to construct genetically engineered microbes, microbiologists will continue to make expanding contributions in these and other areas.

Because microbiology is a diverse science, individuals trained as microbiologists find exciting career opportunities in many areas of the basic and applied sciences. Typically, microbiologists are employed in five major sectors: private industry; clinical laboratories; government agencies; universities; and various other settings such as water treatment, food production/inspection facilities, and other public health-related areas. Recent manpower assessment studies at both the national and

regional levels have provided evidence for a continuing and expanding need for microbiologists such that successful undergraduate students completing this program may look forward to exciting careers. In addition, undergraduates trained in the microbiological sciences are well prepared for competitive application to graduate school programs and professional programs in human or veterinary medicine, optometry or dentistry.

The microbiology curriculum is organized to provide students with the maximum flexibility in meeting their university studies program requirements. In addition, the curriculum is designed to prepare graduates for the future by combining a firm foundation in the basic sciences with a central core of microbiology classes, followed by the opportunity for students to specialize in areas of microbiology suiting their individual interests via the selection of electives. Prior to graduation, microbiology majors must complete the basic requirements and all microbiology core course requirements as listed below. Finally, to assure breadth of exposure in microbiology, students must complete 6 semester hours of microbiology electives.

Basic Course Requirements for Microbiology Majors

Total credit hours.....	121
3000-level or above credits (university requirement)	42 hours
Completion of University Studies 2015 Program Requirements.....	30-36 hours

Basic sciences and quantitative reasoning

MATH 1450, or 1400 and 1405, or 2200	4-6
STAT 2050	4
LIFE 1010 and 2022 or 2023	8
LIFE 3050	4
CHEM 1020 and 1030	8
CHEM 2420 and 2440	8
PHYS 1110 and 1120	8
MOLB 3000	3
MOLB 3610 or 4600 and 4610.....	4-6

Microbiology Core Course Requirements

MICR/MOLB 2021 or 2240	4-5
MICR 4321 or MOLB 4320.....	4
PATB 2220	4
MOLB 4440	3
PATB/MOLB 4400	4
PATB 4710	3
MOLB 4460	3
PATB 4150, or MOLB 4050 (or MOLB 4051 or MOLB 4052).....	1(x2)
MICR Electives	6

Microbiology Electives

In addition to completing the required microbiology courses listed above, students must complete 6 hours of microbiology electives from any of the following lists.

Medical Microbiology

PATB 4001, Epidemiology	3
PATB 4110, Diseases of Food Animals and Horses	3
PATB 4120, Diseases of Wildlife.....	3
PATB 4130, Mammalian Pathobiology	3
PATB 4140, Toxicology.....	3
PATB 4200, Diagnostic Bacteriology.....	1
PATB 4240 Disease Ecology.....	3
PATB 4360, Parasitology.....	4
PATB 4500, Veterinary Parasitology.....	3
PATB 4220, Molecular Pathogenesis.....	3
PHCY 3450, Pathophysiology.....	4
ZOO 4110, HIV and AIDS.....	3

Molecular and Cell Biology

LIFE 3600, Cell Biology	4
MOLB 4260, Quantitative Microscopy.....	1
MOLB 4450, Developmental Genetics.....	3
MOLB 4670, Adv. Molecular Cell Biology...	3

Environmental and Applied Microbiology

BOT 4200, Plant/Microbe Interactions.....	3
BOT 4300, Mycology.....	4
BOT 4390, Fungal Physiology	3
MOLB 4540, Microbial Diversity and Ecology	4
SOIL 4140, Soil Microbiology.....	4
PLNT 3220, Plant Pathology	3
PLNT 4000, Plant Disease Control	3
FDSC 4090, Food Microbiology	3
FDSC 4100, Food Microbiology Lab.....	1

***Students pursuing the B.S. degree in microbiology who wish to pursue a dual major in both microbiology and molecular biology must satisfy the basic science/math and core/elective requirements in microbiology as well as those specified for the B.S. degree in molecular biology PLUS an additional **9 credits of electives in microbiology and/or molecular biology at the 4000/5000 level**

Microbiology (MICR)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

2021 [2210]. General Microbiology. 4. Introduces nature and diversity of microorganisms and their implications for all of biology. Covers comparative properties of eukaryotic and prokaryotic microbes, as well as their roles as disease agents, ecological agents and model systems for understanding of fundamental biological processes at the molecular level. Cross listed with MOLB 2021. *Prerequisites:* LIFE 1010, CHEM 1000 or equivalent.

2220. Pathogenic Microbiology. 3. This course serves as an introduction to bacterial pathogenesis and disease using taxonomy and categorical approaches. Material presented in the course includes maintenance, transmission, molecular mechanisms of virulence factors, pathogen-host interactions, disease process, and treatment and prevention of disease of pathogenic bacteria and fungus. Cross listed with PATB 2220. *Prerequisite:* MOLB/MICR 2021.

2240. Medical Microbiology. 4. Designed primarily for nursing and pre-pharmacy majors, introduces students to microbiology, including the diversity of prokaryotic and eucaryotic microbes, their structural and physiological properties, and their applied medical significance; also covers the basic principles of the immune system and emphasizes the communicable diseases of man caused by microbial pathogens. Cross listed with MOLB 2240. *Prerequisite:* LIFE 1010.

4001. Epidemiology (Diseases in Population). 3. Basic epidemiologic concepts and approaches to population problems in medicine, with examples from veterinary and human health. Covers a wide spectrum of topics and introduces practical applications of epidemiology. Dual listed with MICR 5001; cross listed with PATB 4001. *Prerequisite:* STAT 2050.

4090. Food Microbiology. 3. Discusses micro-organisms and theory of their growth and survival in relation to spoilage and preservation of foods and health hazards in foods. Cross listed with FDSC 4090. *Prerequisite:* MOLB/MICR 2021.

4100. Food Microbiology Lab. 1. Lab techniques used in food microbiology. Cross listed with FDSC 4100. *Prerequisite:* FDSC 4090 or 5090, taken concurrently.

4130. Mammalian Pathobiology. 3. Anatomical basis of disease in mammals. Emphasis on concepts of pathogenesis of disease, and the gross, microscopic and clinicopathological changes associated with lesions: cell injury and

death; cellular degeneration; disturbances of growth and circulation; neoplasia; inflammation; and recognition of gross and microscopic tissue changes. Background in immunology will be beneficial. Dual listed with MICR 5130; cross listed with PATB 4130. *Prerequisite:* C or better in LIFE 2022.

4140. Soil Microbiology. 4. Fundamental principles of soil microbiology and how they relate to microbial ecology, environmental contamination, agriculture and forestry. Dual listed with MICR 5140; cross listed with SOIL 4140. *Prerequisite:* SOIL 2010.

4200. Diagnostic Bacteriology. 1. Practical training with emphasis on diagnostic procedures used in a clinical microbiology laboratory. Students identify bacterial pathogens of animals and humans. Taught in a clinical setting utilizing selected clinical material. Techniques employed in the processing and identification of clinically significant bacteria are used and discussed. Safe laboratory practices for working with biohazards are presented. Cross listed with PATB 4200. *Prerequisites:* junior standing and a MICR course which included a laboratory.

4220. Molecular Mechanisms of Bacterial Pathogenesis. 3. Intended as a survey of the molecular mechanisms that have evolved in pathogenic bacterial species which result in disease. The broad-scoped objective is to assist students in gaining an understanding of principals and concepts as they apply to common themes of bacterial virulence acting on higher order host organisms. In-class review/discussion of scholarly manuscripts, historical to present day, is paramount in allowing students to gain a better appreciation and comprehension of biological principals and concepts through knowledge of experimental approaches. Cross listed with PATB 4220; dual listed with MICR 5220. *Prerequisites:* PATB/MICR 2220 and statistics (or epidemiology).

4321. Microbiology Capstone. 4. [(none) ▶COM3] Using a problem-based student learning model, students conceptualize, propose, perform and present a microbiology research study to address a real community problem. Students maintain a lab notebook, write an NSF-style research proposal, formulate hypotheses, engage in hands-on laboratory hypothesis testing and design and present a scientific poster. *Prerequisite:* MICR majors with junior or senior standing.

4360. Medical Entomology and Parasitology. 4. Emphasis on medically important arthropods, protozoa, and worms; clinical effects of infection epidemiology avoidance/control and identification/diagnosis. PATB/ENTO 4360. *Prerequisite* 8 hours of biological science.

4440. Microbial Genetics. 3. Discusses microbial genetic approaches to study cell function and provides a molecular foundation for understanding how genes work to elicit phenotypes. Cross listed with MOLB 4440. *Prerequisites:* MOLB 2021 and 3000 and LIFE 3050. (Normally offered spring semester).

4460. Microbial Physiology. 3. Studies life processes of microbes as mediated by their structures acting in consort, in response to changing environments. Cross listed with MOLB 4460. *Prerequisites:* Minimum grade of C- in MOLB/MICR 2021 or 2240 and MOLB 3610 or 4610. (Normally offered fall semester).

4500. Veterinary Entomology and Parasitology. 3. Biology, importance and control of arthropod, helminth and protozoan parasites of food and companion animals. Diagnosis and identification of live and preserved specimens. Cross listed with ENTO 4500. Cross listed with PATB/ENTO 4500. *Prerequisite:* 8 hours of biological science.

4540. Microbial Diversity and Ecology. 4. Introduces the diversity and ecology of soil microbes through an integrated lecture and laboratory course. Emphasis on molecular approaches to analyzing microbial diversity and evolution, and student-directed experimental design. Provides a continuum of realistic research experiences in molecular microbial ecology, from field work to evolutionary analysis of DNA sequence data. Cross listed with MOLB/SOIL 4540. Dual listed with MOLB/SOIL/ECOL 5540. *Prerequisite:* MOLB/MICR 2021.

4710. Medical Virology. 3. Human and animal viruses as biological entities. Methods of study, classification, replication strategies, diagnostic approaches, epidemiology and significance as disease agents. Cross listed with PATB 4710. *Prerequisite:* MICR/PATB 2220 or MOLB/MICR 2240.

5001. Epidemiology (Diseases in Population). 3. Basic epidemiologic concepts and approaches to population problems in medicine, with examples from veterinary and human health. Covers a wide spectrum of topics and introduces practical applications of epidemiology. Dual listed with MICR 4001; cross listed with PATB 5001. *Prerequisite:* STAT 2050.

5130. Mammalian Pathobiology. 3. Anatomical basis of disease in mammals. Emphasis on concepts of pathogenesis of disease, and the gross, microscopic and clinicopathological changes associated with lesions: cell injury and death; cellular degeneration; disturbances of growth and circulation; neoplasia; inflammation; and recognition of gross and microscopic tissue changes. Background in immunology

will be beneficial. Dual listed with MICR 4130; cross listed with PATB 5130. *Prerequisite:* C or better in LIFE 2022.

5140. Soil Microbiology. 4. Fundamental principles of soil microbiology and how they relate to microbial ecology, environmental contamination, agriculture and forestry. Dual listed with MICR 4140; cross listed with SOIL 5140. *Prerequisite:* SOIL 2010.

5220. Molecular Mechanisms of Bacterial Pathogenesis. 3. Intended as a survey of the molecular mechanisms that have evolved in pathogenic bacterial species which result in disease. The broad-scoped objective is to assist students in gaining an understanding of principals and concepts as they apply to common themes of bacterial virulence acting on higher order host organisms. In-class review/discussion of scholarly manuscripts, historical to present day, is paramount in allowing students to gain a better appreciation and comprehension of biological principals and concepts through knowledge of experimental approaches. Dual listed with MICR 4220; cross listed with PATB 4220/5220. *Prerequisites:* PATB/MICR 2220 and statistics (or epidemiology).

Department of Molecular Biology

203 Animal Science/Molecular Biology Bldg., (307) 766-3300

Web site: www.uwyo.edu/MolecBio/
Department Chair: Peter E. Thorsness

Professors

DAVID FAY, B.S. Tufts University 1988; Ph.D. Yale University 1995; Professor of Molecular Biology 2010, 2001.

MARK GOMELSKY, B.S. Moscow Institute of Chemical Technology 1986; M.S. 1988; Ph.D. Institute of Genetics and Selection of Industrial Microorganisms 1991; Professor of Molecular Biology 2011, 1999.

DONALD L. JARVIS, B.S. Idaho State University 1978; M.S. 1980; Ph.D. Baylor College of Medicine 1986; Professor of Molecular Biology 2000, 1998.

PETER E. THORSNESS, B.A. Colorado College 1982; Ph.D. University of California-Berkeley 1987; Professor of Molecular Biology 2002, 1991.

DANIEL WALL, B.A. Sonoma State University 1988; Ph.D. University of Utah 1994; Professor of Molecular Biology 2019, 2007.

CYNTHIA WEINIG, B.A. Brown University 1991; Ph.D. Indiana University; Professor of Botany and Molecular Biology 2013, 2007.

Associate Professors

GRANT BOWMAN, B.S. University of Rochester 1997; Ph.D. University of Chicago 2004; Associate Professor of Molecular Biology 2019, 2012.

JESSE C. GATLIN, B.S. University of Colorado-Boulder 1995; Ph.D. University of Colorado-Aurora 2005; Associate Professor of Molecular Biology 2016, 2010.

JASON GIGLEY, B.S. University of New Hampshire 1994; Ph.D. Dartmouth Medical School 2007; Associate Professor of Molecular Biology 2019, 2012.

PAMELA J. LANGER, B.S. Indiana University-Indiana 1973; Ph.D. Massachusetts Institute of Technology 1980; Associate Professor of Molecular Biology 1994, 1987.

DANIEL L. LEVY, B.S. California Institute of Technology 2000; Ph.D. University of California San Francisco 2006; Associate Professor of Molecular Biology 2016, 2011.

Assistant Professors

THOMAS BOOTHBY, B.S. Tulane University 2008; Ph.D. University of Maryland 2013; Assistant Professor of Molecular Biology, 2019.

EUNSOOK PARK, M.S. Seoul National University 2001; Ph.D. University of Tennessee, Knoxville 2010; Assistant Professor of Molecular Biology 2019.

TODD SCHOBORG, B.S. Murray State University 2008; Ph.D. University of Tennessee 2013; Assistant Professor of Molecular Biology, 2019.

Adjunct Professor

ALEXANDRE MATOV, M.S. Technical ANNE W. SYLVESTER, B.S. University of Washington 1980; M.S. 1982; Ph.D. 1987; Professor of Molecular Biology 2010, 2006.

Professors Emeritus

Dale Isaak, Randy Lewis, Nancy Petersen, Don Roth, Mark M. Stayton, Jordanka Zlatanova

Modern biology is based on a fundamental understanding of molecular processes. Recent advances in molecular biology have led to an explosion of knowledge about gene expression and the role gene products play in cell function. Undergraduate programs in molecular biology offer learning opportunities at the forefront of modern biology.

The molecular biology degree programs are designed to prepare students for the future by combining a foundation in basic sciences and humanities with a broad selection of courses in molecular biology, biochemistry, genetics and microbiology. Advanced undergraduates attend an outside speaker's program that includes some of the world's best-known

scientists. Modern, well-equipped teaching and research laboratories contribute significantly to the educational experience of a student. All junior- and senior-level undergraduates are encouraged to participate in research projects with individual faculty members. Involvement in an active research program provides the student with an additional dimension of learning beyond what is assimilated in courses. A student learns to plan experiments, solve technical problems and experience scientific advances first hand. An undergraduate research project also promotes close interaction between the undergraduate and graduate students, postdoctoral researchers, staff and faculty.

Many molecular biology majors continue their education beyond the bachelor's level by going to graduate school or to medical, dental or veterinary school. Some students choose to use their education to gain employment in biotechnology, clinical or basic research laboratories. Other career choices include teaching, medical technology, law and business.

To obtain a B.S. degree in molecular biology, a student, with the aid of a molecular biology adviser, designs a program of study that includes courses from the Molecular Biology Core Requirements and Electives listed below. Additional course lists are provided as an aid in developing an individualized program of study in key Interest Areas such as Biochemistry, Cell and Molecular Genetics, Computational Molecular Biology, Microbiology, and Preprofessional Health Sciences studies. Courses listed under the Interest Areas are optional and the student and adviser will design a unique curriculum suited to the student's personal interests. Flexibility in course selection also permits students to fulfill the various requirements for postgraduate and professional schools. Completion of a B.S. in Molecular Biology provides a student with the tools needed to open the door to exciting futures in science, medicine and agriculture.

We expect that our graduating students will have a strong foundation in basic science, biochemistry and molecular biology that will enable them to:

1. understand the basis of multiple molecular mechanisms central to gene expression;
2. utilize molecular and microbiological laboratory techniques in future jobs or programs and trouble-shoot experimental challenges;
3. apply for graduate programs in molecular biology, microbiology or other life sciences;

4. begin employment as a laboratory research assistant in academia or the medical or agricultural biotechnology industries;
5. utilize a background in biochemistry, cell and molecular biology to promote success in the basic science curriculum in medical or other health professional schools;
6. integrate a background in biochemistry, cell and molecular biology into career development in professions such as law, genetic counseling, or public health policy;
7. employ evidence-based scientific reasoning skills in evaluating the use of molecular genetics in the prevention, diagnosis and treatment of medical disorders.

Requirements for Molecular Biology Majors

General Requirements	Hours
Total credits (college requirement) 3000-level or above	120
(university requirement)	42
Fulfillment of University Studies Program (consult adviser)	
Fulfillment of molecular biology general science, core and elective requirements listed below	

MOLB Requirements	Hours
<i>1. General Science Requirement</i>	
LIFE 1010	4
MOLB 2021	4
LIFE 3050	4
CHEM 1020 and 1030	8
CHEM 2420 and 2440	8
PHYS 1110 and 1120	8
MATH 2200*	4
STAT 2050	4
Total	44

*The alternative math courses MATH 1450 or 1400 and 1405 may be substituted with adviser approval.

2. MOLB Core Requirement

MOLB 3000	3
MOLB 4600 and 4610	6
MOLB 4320	4
MOLB 4485	1
MOLB 4050 and 4051 or 4052	2
Total	16

3. MOLB Advanced Core Requirement

MOLB 4440 or 4450 or 4670	3
Total	3

4. MOLB Elective Requirement (10 hours)

Courses from the following list that were not used to fulfill the MOLB Advanced Core Requirement may be applied to the MOLB Elective Requirement; a maximum of 3 credits of MOLB 4010 may be counted toward the MOLB Elective Requirement.

MOLB 4010	1-3
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MOLB 4100	4
MOLB 4260	1
MOLB 4400	4
MOLB 4440	3
MOLB 4450	3
MOLB 4460	3
MOLB 4540	4
MOLB 4670	3

Molecular Biology Interest Areas

After discussing individual interests with a molecular biology adviser, a student should enroll in additional courses that will enhance preparation for a chosen career objective. Listed below are recommended courses that are not required but will further develop a student's skills and understanding in five Interest Areas.

Biochemistry	Hours
CHEM 2230	5
CHEM 3550 or 4507 and 4508	3-6
CHEM 4230	5
CHEM 4400	3
CHEM 4560	3
CHE 4100	3
COSC 1010 or 1030 or 1100	3-4
MOLB 4010	6
MOLB 4460	3

Cell and Molecular Genetics	Hours
MOLB 4010	6
MOLB 4260	1
MOLB 4440	3
MOLB 4450	3
MOLB 4670	3
ZOO 4280	3
ZOO 4340	4

Computational Molecular Biology Hours

COSC 1010 or 1030 or 1100	3-4
COSC 2030	4
IMGT 1400	3
IMGT 3400	3
MOLB 4010	6
BOT 4550	4
CHEM 4560	3
STAT 3050	3
STAT 4255	3
STAT 5380	4

Microbiology Hours

MICR 2220	4
MICR 4130	3
MICR 4220	3
MICR 4360	4
MOLB 4010	6
MOLB 4400	4
MOLB 4440	3
MOLB 4460	3
MOLB 4540	4
MICR 4710	3

Preprofessional Health Sciences	Hours
MOLB 4010	3
MOLB 4100	4
MOLB 4400	4
MOLB 4450	3
MOLB 4670	3
MICR 2220	4
MICR 4710	3
PHCY 3450	4
PSYC 1000	3
PSYC 2210 or 2340.....	3
SOC 1000	3
SOC 3550	3
ZOO 2040/2041	3-4
ZOO 3115	4
ZOO 4125	5
ZOO 4280	3
ZOO 4340	4

Recommended Course Sequence

In order to fulfill course prerequisites in a timely manner, the following sequence of courses relevant to the MOLB BS degree requirements is recommended. A complete sequence of recommended courses fulfilling all university and MOLB degree requirements is listed in the Molecular Biology 4-year plan, available on the web or by request from the department. In consultation with a student's advisor, electives should be selected to fulfill University Studies requirements and to enhance a student's educational background.

Note that this example course sequence does not include specified credits for undergraduate research, summer courses, or study abroad experiences. Many students opt to complete their undergraduate courses in five years in order to take full advantage of the educational and undergraduate research opportunities in the Department of Molecular Biology.

FRESHMAN YEAR: Fall	Hrs.
LIFE 1010	4
CHEM 1020	4
USP First-Year Seminar.....	3
MATH 2200	4

FRESHMAN YEAR: Spring	Hrs.
MOLB 2021	4
CHEM 1030	4
USP COM1	3
STAT 2050	4

SOPHOMORE YEAR: Fall	Hrs.
MOLB 3000	3
CHEM 2420	4
USP COM2	3

SOPHOMORE YEAR: Spring	Hrs.
CHEM 2440	4

JUNIOR YEAR: Fall	Hrs.
MOLB 4600	3
PHYS 1110	4
MOLB 4485	1
LIFE 3050	4

JUNIOR YEAR: Spring	Hrs.
MOLB 4610	3
PHYS 1120	4
MOLB 4320	4
MOLB 4000-level.....	3

SENIOR YEAR: Fall	Hrs.
MOLB 4000-level.....	6-7
MOLB 4050	1

SENIOR YEAR: Spring	Hrs.
MOLB 4000-level.....	3-6
MOLB 4051	1

Requirements for Undergraduate Minor in Molecular Biology

Students wishing to minor in molecular biology should discuss their plans with an adviser in the Department of Molecular Biology. Formal declaration of molecular biology as a minor requires 1) submission of a form that must be approved by the Department of Molecular Biology and the College of Agriculture and Natural Resources Dean's Office, 2) appointment of a minor adviser from the Department of Molecular Biology.

To receive a minor in molecular biology, a student must complete courses listed in the following areas:

Science Foundation course requirements	Hrs.
LIFE 1010	4
LIFE 3050	4
CHEM 1020 and 1030	8
CHEM 2300 or 2420 and 2440.....	4-8
MATH 2200 or 1450 or 1400 and 1405	4-6

MOLB course requirements	Hrs.
MOLB 2021	4
MOLB 3000	3
Lab course MOLB 4320 or 4010	3-4
MOLB 3610 and 5 additional MOLB credits or MOLB 4600 and 4610 and 3 additional MOLB credits (excluding MOLB 4010, 4050, 4051, 4052 and 4850).	

Graduate Study

The Department of Molecular Biology offers the Ph.D., M.S. and M.A. degrees for students who wish to do graduate work in molecular biology, in preparation for careers in academia, the biotechnology industry, medicine, or other professions. Prospective

graduate students should visit the Molecular Biology Departmental web site (www.uwyo.edu/molecbio/) or the Graduate Program in Molecular and Cellular Life Sciences web site (www.uwyo.edu/mcls/) for more information.

Program Specific Admission Requirements

A prospective student must apply to a Molecular Biology Department faculty member with whom they wish to work (www.uwyo.edu/molecbio/faculty-and-staff/). Once a mentor has been identified, the student should apply to the graduate program of choice.

Candidates for all molecular biology graduate programs must have attained minimum entrance requirements, as specified by:

(1) Department of Molecular Biology graduate admission requirements, posted at www.uwyo.edu/molecbio/, and

(2) University of Wyoming Graduate Student Regulations and policies, posted on the Office of the Registrar website: www.uwyo.edu/registrar/university_catalog/grad_students.html

Instructions for applying to the Molecular Biology Graduate Degree Programs are posted at www.uwyo.edu/molecbio/degree-programs/index.html.

Program Specific Degree Requirements

Throughout the degree program, a graduate student is guided and evaluated by the research adviser and graduate committee. Here we provide only general descriptions of degree programs. Details of coursework and other requirements for obtaining a Ph.D., M.S. or M.A. degree in Molecular Biology are specified in the Departmental Policies for the Graduate Programs, listed by date of program entrance on the departmental website (www.uwyo.edu/molecbio/).

Doctor of Philosophy in Molecular Biology (Ph.D.)

The Ph.D. is a research-intensive degree. The student conducts a guided research project in the laboratory into which they have been accepted. The faculty research adviser is responsible for financial support of the student. A student will conduct a research project that is expected to result in multiple publications in research journals as well as presentations in the department and at scientific meetings. Student performance is monitored by a dissertation committee that will evaluate a student's research proposal, preliminary examination, seminar presentations, written dissertation, final public seminar, and final oral defense

of the dissertation. In consultation with the faculty research adviser, a student may elect to be a teaching assistant. Students pursuing the Ph.D. degree in Molecular Biology usually complete their program in about five years.

Master of Science in Molecular Biology (M.S.)

An M.S. degree student will conduct a research project that is expected to result in publication in research journals as well as presentations in the department and at scientific meetings. Student performance is monitored by a thesis committee that will evaluate a student's research proposal, seminar presentations, written thesis, final public seminar, and final oral defense of the thesis. In consultation with the faculty research adviser, a student may elect to be a teaching assistant. A student should not have expectations of financial support, however funding may be negotiated on an individual basis and is at the discretion of the faculty research adviser. Students pursuing the M.S. degree in Molecular Biology usually complete their program in about two years.

Master of Arts in Molecular Biology (M.A.)

Students interested in graduate study but who intend to apply for a post-graduate professional program such as medical or law school, should consider an M.A. program of study. An M.A. degree candidate will negotiate with their faculty adviser to formulate an appropriate research project. Student performance is monitored by a thesis committee that will evaluate a student's written thesis, final public seminar, and final oral defense of the thesis. A student pursuing an M.A. degree should not have expectations of financial support. Students pursuing the M.A. degree in Molecular Biology usually complete their program in two academic semesters plus two summers.

Molecular Biology (MOLB)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀Q]).

1101. First-Year Seminar. 3. [(none)◀FYS] 2021 [2210]. General Microbiology. 4. Introduces nature and diversity of microorganisms and their implication for all of biology. Covers comparative properties of eukaryotic and prokaryotic microbes, as well as their roles as disease agents, ecological agents, and model systems for understanding of fundamental biological processes at the molecular level. Cross listed with MICR 2021. *Prerequisites:* A grade of C or better in LIFE 1010 and CHEM 1000 or 1020.

2240. Medical Microbiology. 4. Designed primarily for nursing and pre-pharmacy majors. Introduces microbiology, including the diversity of prokaryotic and eukaryotic microbes, their structural and physiological properties, and their applied medical significance. Covers the basic principles of the immune system and emphasizes the communicable diseases of man caused by microbial pathogens. Cross listed with MICR 2240. *Prerequisites:* LIFE 1010. (Normally offered spring semester.)

3000. Introduction to Molecular Biology. 3. An introduction to molecular biological processes governing cellular events is presented in the context of the structure of genomes, genes and chromosomes, DNA replication, gene expression, signal transduction pathways and the regulation of cellular processes in disease and development. Experimental methods and technologies will also be discussed. *Prerequisites:* LIFE 1010 and CHEM 1030; MOLB/MICR 2021 recommended. (Normally offered fall and summer semesters.)

3610. Principles of Biochemistry. 4. One-semester biochemistry course for life-, health- and physical-science students. Introduces a full range of biochemical concepts including discussion of major macromolecules, metabolism and molecular biology. *Prerequisites:* LIFE 1010 and a minimum grade of C- in CHEM 2300 or CHEM 2420. (Normally offered fall and some summer semesters)

4010. Laboratory Research in Molecular Biology. 1-3 (Max. 12). Undergraduate student will conduct a laboratory or computational research project under the guidance of a Molecular Biology Department faculty member, who will serve as the student's research adviser. *Prerequisites:* LIFE 1010 or concurrent enrollment, and consent of instructor.

4050. Student Seminar. 1 (Max. 4). Exposes students to current topics in molecular biosciences and examines primary journal literature with oral presentations and class discussions. Offered Satisfactory/Unsatisfactory only. *Prerequisites:* MOLB 3000 and 3610 or 4600.

4051 [4050]. Departmental Seminar. 1 (Max. 15). Attend a series of weekly seminars on a diverse set of research topics presented by visiting faculty or research scientists and will participate in a discussion following the seminar. Satisfactory/Unsatisfactory only. Dual listed with MOLB 5051. *Prerequisite:* MOLB 3000 or 3610 or 4600.

4052. [4050]. Summer Seminar. 1 (Max. 5). Consists of one week of lectures, presented by a renowned scientist from either academics or industry. The material presented is taken from

the research program of the speaker. Offered Satisfactory/Unsatisfactory only. Dual listed with MOLB 5052.

4100 [3980]. Clinical Biochemistry. 4. Integrated discussion of biochemical, molecular, and physiological principles underlying human medical disorders and biochemical and molecular genetics tests used in prevention, diagnosis and treatment. Weekly discussion sessions review basic concepts studied by students independently and class sessions include problem solving in an active learning format, lectures and other applied activities. *Prerequisite:* Minimum grade of C- in MOLB 3610 or 4600; course in physiology recommended (e.g. ZOO 3115). (Normally offered spring semester)

4260. Quantitative Microscopy. 1. Acquaints students with principles of light microscopy, use of fluorescent probes and image processing software. Students use phase contrast, fluorescent, and confocal microscopes learning to measure and compare size and intensity of images. Dual listed with MOLB 5260. *Prerequisites:* MOLB 4600 or LIFE 3600, and PHYS 1120.

4320. Investigations in Molecular Biology. 4. [(none)◀COM3] Research project of the type experienced by graduate students or research associates in academic or commercial settings. Student performance, engagement and understanding will be assessed through written assignments (literature reviews, lab reports), digital communication (electronic research notebook, data presentation) and oral communications (literature presentation, research effort report). *Prerequisite:* Minimum grade of C- in MOLB 3610 or MOLB 4600.

4400. Immunology. 4. Biology of immune system; cellular and molecular mechanisms; host resistance to infectious agents; as well as hypersensitivities, autoimmunity, tumor and tissue rejection. Includes laboratory for immunological techniques. Cross listed with PATB 4400. Dual listed with MOLB 5400. *Prerequisite:* MOLB/MICR 2021 or 2240 or PATB 2220, and a minimum grade of C- in MOLB 3000 or MOLB 3610. (Normally offered fall semester)

4440. Microbial Genetics. 3. Discusses microbial genetic approaches to study cell function and provides a molecular foundation for understanding how genes work to elicit phenotypes. Dual listed with MOLB 5440; Cross-listed with MICR 4440. *Prerequisites:* MOLB 2021 and 3000 and LIFE 3050. (Normally offered spring semester)

4450. Cell and Developmental Genetics. 3. Integrates the genetic control of cell regulation and animal development in both vertebrate and invertebrate model systems such as *Drosophila*, *C. elegans* and the mouse. Includes studies of

eukaryotic signal transduction, gene control, and current transgenic technologies. Dual listed with MOLB 5450. *Prerequisites:* MOLB 3000 and MOLB 4600 and LIFE 3050.

4460. Microbial Physiology and Metabolism. 3. Studies life processes of microbes as mediated by their structures acting in consort, in response to changing environments. Cross-listed with MICR 4460. Dual listed with MOLB 5460. *Prerequisites:* Minimum grade of C- in MOLB/MICR 2021 or 2240 and MOLB 3610 or 4610. (Normally offered fall semester)

4485. Computers in Biology. 1. Lectures and hands-on computational exercises in bioinformatics that prepare students to use a range of graphical and command-line tools to analyze genetic data efficiently at various scales. Exercises in several subdisciplines of bioinformatics are implemented in Linux on local workstations or remote servers. Dual listed with MOLB 5485. *Prerequisites:* Minimum grade of C- in MOLB 3000 or LIFE 3050. (Normally offered fall semester)

4540. Microbial Diversity and Ecology. 4. Introduces the diversity and ecology of soil microbes through an integrated lecture and laboratory course. Emphasis on molecular approaches to analyzing microbial diversity and evolution, and student-directed experimental design. Provides a continuum of realistic research experiences in molecular microbial ecology, from field work to evolutionary analysis of DNA sequence data. Cross listed with MICR/SOIL 4540. Dual listed with MOLB/SOIL/ECOL 5540. *Prerequisite:* MOLB 2021.

4600. Biochemistry 1: Bioenergetics and Metabolism. 3. Structure and function of major biomolecules, energy transduction, and central biochemical processes are discussed with an emphasis on regulatory controls in metabolism and cellular processes. Dual listed with MOLB 5600. *Prerequisites:* Minimum grade of C- in CHEM 2300 or CHEM 2420 and MOLB 3000 or MOLB 3610. (Normally offered fall semester)

4610. Biochemistry 2: Molecular Mechanisms. 3. Biochemical and molecular mechanisms underlying cell function, including gene expression and epigenetic regulation, RNA and protein modification and function, assembly of macromolecular complexes, signaling and regulation of the cell cycle, are discussed. Dual listed with MOLB 5610. *Prerequisite:* Minimum grade of C- in MOLB 3610 or MOLB 4600. (Normally offered spring semester)

4670. Advanced Molecular Cell Biology. 3. Key concepts in eukaryotic cell biology will be presented with a focus on cellular processes that form the basis for human diseases. Cel-

lular organization, dynamics, and signaling will be emphasized. Students will also explore principles of research design by critical reading and discussion of scientific literature. Dual listed with MOLB 5670. *Prerequisites:* MOLB 3000 and MOLB 3610 or MOLB 4600.

4850. Undergraduate Teaching Internship. 1 (Max. 4). Undergraduate student will assist in classroom or laboratory teaching under the guidance of an instructor in Molecular Biology. Offered Satisfactory/Unsatisfactory only. *Prerequisites:* junior standing and consent of instructor.

4990 Topics In: ___ 1-3 (Max. 6). Lectures, literature reviews and discussion of selected current topics in different areas of molecular biology. Please check class schedule for current offerings each semester. *Prerequisites:* MOLB 3000 or 3610 or 4600.

5010. Advanced Laboratory Research in Molecular Biology. 1-3 (Max. 18). Students in PhD, MS and MA programs in Molecular Biology and doctoral students in the Molecular and Cellular Life Sciences (MCLS) graduate program, work in laboratory or computational research projects under the guidance of a Molecular Biology faculty member. *Prerequisites:* graduate standing and consent of instructor.

5050. Advanced Student Seminar. 2 (Max. 8). Introduction of reading, analyzing, and discussing primary sources in scientific literature. Read primary research papers, give presentations with full participation in critical discussions of data and interpretations of all journal articles analyzed. Papers chosen for review are typically related to research of Molecular Biology Departmental Seminar Series speakers. Offered Satisfactory/Unsatisfactory only. *Prerequisites:* MOLB 3000 and 3610 or 4600.

5051. Department Seminar. 1 (Max. 15). Required attendance at a series of weekly seminars presented by visiting faculty on a diverse set of research topics. Undergraduates are able to use one credit hour to partially fulfill the seminar requirement. S/U only. Dual listed with MOLB 4051. *Prerequisite:* MOLB 3000 or 3610 or 4600.

5052. Summer Seminar. 1 (Max. 5). Consists of one week of lectures, presented by a renowned scientist from either academics or industry. The material presented is taken from the research program of the speaker. S/U Only. Dual listed with MOLB 4052.

5055. Molecular Monday. 1 (Max. 12). Students will present and hear formal presentations of research being conducted at the University of Wyoming in the molecular biosciences. Participation in question and answer periods following presentations is required,

as is the completion of an evaluation form for each presentation. *Prerequisite:* graduate standing.

5056. Current Topics in Cell Biology. 2 (Max. 18). Students present their ongoing laboratory research and receive feedback from lab group members. Principles of research design will be explored by critical reading and discussion of current topical literature. *Prerequisite:* graduate standing.

5057. Microbial and Synthetic Biol. 2 (Max. 18). Students will present current research in the fields of Molecular Microbiology and Synthetic Biology, which will be followed by a critical discussion moderated by the course instructors. Students will explore the principles of research design by critical reading and discussion of scientific literature. *Prerequisite:* graduate standing.

5058. Experimental Molec Genetics. 2 (Max. 18). Students will formally present their research on molecular biology projects and will actively participate in discussion of other student's presentations. Students will also select current topical research articles and present critical evaluations of those articles to the class. *Prerequisite:* graduate standing.

5260. Quantitative Microscopy. 1. Acquaints students with principles of light microscopy, use of fluorescent probes and image processing software. Students use phase contrast, fluorescent, and confocal microscopes learning to measure and compare size and intensity of images. Dual listed with MOLB 4260. *Prerequisite:* MOLB 4600 or LIFE 3600, and PHYS 1120.

5400. Immunology. 4. Biology of immune system; cellular and molecular mechanisms; host resistance to infectious agents; as well as hypersensitivities, autoimmunity, tumor and tissue rejection. Includes laboratory for immunological techniques. Cross listed with PATB 4400. Dual listed with MOLB 4400. *Prerequisite:* MOLB/MICR 2021 or 2240 or PATB 2220, and a minimum grade of C- in MOLB 3000 or MOLB 3610. (Normally offered fall semester)

5440. Microbial Genetics. 3. Discusses microbial genetic approaches to study cell function and provides a molecular foundation for understanding how genes work to elicit phenotypes. Dual listed with MOLB 4440. *Prerequisites:* MOLB 2021 and 3000 and LIFE 3050. (Normally offered spring semester)

5450. Cell and Developmental Genetics. 3. Integrates the genetic control of cell regulation and animal development in both vertebrate and invertebrate model systems such as *Drosophila*, *C elegans* and the mouse. Includes studies of eukaryotic signal transduction, gene

control, and current transgenic technologies. Dual listed with MOLB 4450. *Prerequisites:* MOLB 3000 and MOLB 4600 and LIFE 3050.

5460. Microbial Physiology and Metabolism I. 3. Studies life processes of microbes as mediated by their structures acting in consort, in response to changing environments. Dual listed with MOLB 4460. *Prerequisites:* Minimum grade of C- in MOLB/MICR 2021 or 2240 and MOLB 3610 or 4610. (Normally offered fall semester.)

5485. Computers in Biology. 1. Lectures and hands-on computational exercises in bioinformatics that prepare students to use a range of graphical and command-line tools to analyze genetic data efficiently at various scales. Exercises in several subdisciplines of bioinformatics are implemented in Linux on local workstations or remote servers. Dual listed with MOLB 4485. *Prerequisites:* Minimum grade of C- in MOLB 3000 or LIFE 3050. (Normally offered fall semester)

5520. Molecular and Cellular Life Sciences Laboratory Rotations. 3 (Max. 6). Laboratory research rotations for first year Molecular and Cellular Life Sciences (MCLS) students in the doctoral program. *Prerequisite:* Enrollment in the Molecular and Cellular Life Sciences (MCLS) program.

5521. Molecular and Cellular Life Sciences Cornerstone. 1. Introduction for students in the Molecular and Cellular Life Sciences program to graduate school and research. Exposes students to diverse faculty research programs and elements fundamental to successful graduate and scientific careers, including scientific publishing, grants, careers, intellectual property, and ethical expectations. Offered Satisfactory/Unsatisfactory only. *Prerequisite:* Enrollment in the Molecular and Cellular Life Sciences doctoral program. (Normally offered fall semester)

5540. Microbial Diversity and Ecology. 4. Introduces the diversity and ecology of soil microbes through an integrated lecture and laboratory course. Emphasis on molecular approaches to analyzing microbial diversity and evolution, and student-directed experimental design. Provides a continuum of realistic research experiences in molecular microbial ecology, from field work to evolutionary analysis of DNA sequence data. Cross listed with MOLB/MICR/SOIL 4540. Dual listed with SOIL/ECOL 5540. *Prerequisite:* MOLB 2021.

5600. Biochemistry 1: Bioenergetics and Metabolism. 3. Structure and function of major biomolecules, energy transduction, and central biochemical processes are discussed with an emphasis on regulatory controls in

metabolism and cellular processes. Dual listed with MOLB 4600. *Prerequisites:* consent of instructor. (Normally offered fall semester)

5610. Biochemistry 2: Molecular Mechanisms. 3. Biochemical and molecular mechanisms underlying cell function, including gene expression and epigenetic regulation, RNA and protein modification and function, assembly of macromolecular complexes, signaling and regulation of the cell cycle, are discussed. Dual listed with MOLB 4610. *Prerequisite:* consent of instructor. (Normally offered spring semester)

5630. Advanced Topics in Molecular Biology. 1-3 (Max. 6). Lectures, literature reviews and discussion of selected current topics in molecular biology. Check class schedule for current offerings each semester. *Prerequisites:* MOLB 3000 or 3610 or 4600.

5670. Advanced Molecular Cell Biology. 3. Key concepts in eukaryotic cell biology will be presented with a focus on cellular processes that form the basis for human diseases. Cellular organization, dynamics, and signaling will be emphasized. Students will also explore principles of research design by critical reading and discussion of scientific literature. Dual listed with MOLB 4670. *Prerequisites:* MOLB 3000 and MOLB 3610 or MOLB 4600.

5700. Principles of Biomedical Research. 3. This series of complementary workshops will provide opportunities to develop knowledge and skills in scientific methodology, data analysis, statistical interpretation and representation, scientific communication, research codes and ethics, entrepreneurship, and interpersonal conduct. Students will also learn about career options and develop individual goals and trajectories based on strengths and interests. *Prerequisite:* Graduate student status (biomedical fields preferred). Satisfactory/Unsatisfactory only. (Normally offered spring semester)

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisites:* graduate standing and consent of instructor.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1 - 12. (Max 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5980. Dissertation Research. 1-12 (Max. 48). Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate degree program.

5990. Internship. 1 - 12 (Max. 24). *Prerequisite:* graduate standing.

Department of Plant Sciences
Room 50 Agriculture Building
PHONE: (307) 766-3103
Website: www.uwyo.edu/plantsciences
Department Head: Andrew Kniss

Professors:

JIM HEITHOLT, B.S. Western Illinois University 1978; M.S. University of Missouri 1980; Ph.D. University of Kentucky 1984; Professor of Crop Physiology 2014.

M. ANOWARUL ISLAM, B.S. Bangladesh Agricultural University 1990; M.S. Institute of Postgraduate Studies in Agriculture, Bangladesh 1996; Ph.D. University of Sydney, Australia 2003; Professor of Forage Agronomy 2019, 2008.

ANDREW R. KNISS, B.S. University of Wyoming 2001; M.S. University of Nebraska-Lincoln 2003; Ph.D. University of Wyoming 2006; Professor of Weed Ecology and Management in Cropping Systems 2018, 2007.

Associate Professors:

RANDA JABBOUR, B.S. Rochester Institute of Technology 2003; Ph.D. Pennsylvania State University 2009; Associate Professor of Agroecology 2019, 2013.

BRIAN A. MEALOR, B.S. North Georgia College and State University 1999; M.S. University of Wyoming 2003; Ph.D. 2006; Director, Sheridan Research and Extension Center; Associate Professor of Rangeland Restoration and Weed Science 2015, 2009.

URSZULA NORTON, B.S. Warsaw Agricultural University 1988; M.S. 1990; M.S. Iowa State University 1995; Ph.D. University of Montana 2000; Associate Professor of Agroecology and Soil Science 2015, 2009.

Assistant Professors:

CARRIE EBERLE, B.S. University of Wisconsin-Madison 2005; Ph.D. University of Minnesota 2012; Assistant Professor of Agronomy and Cropping Systems 2016.

DEBALIN SARANGI, B.S. Bidhan Chandra Krishi Viswavidyalaya India 2010; M.S. Punjab Agricultural University India 2012; Ph.D. University of Nebraska-Lincoln 2016; Assistant Professor of Agronomy and Weed Science 2019.

WILLIAM STUMP, B.S. Purdue University 1981; M.S. Colorado State University 1984; B.F.A. 1991; Ph.D. 1997; Assistant Professor of Plant Pathology 2014.

DAN TEKIELA, B.S. University of Illinois 2011; Ph.D. Virginia Tech University 2016; Assistant Professor of Invasive Plant Ecology and Management 2016.

Academic Professionals:

CHRIS HILGERT, B.S. Oregon State University 2001; M.S. 2003; Extension Horticulture Specialist, Master Gardener Coordinator 2011.

KAREN PANTER, B.S. Colorado State University 1979; M.S. University of Nebraska 1981; Ph.D. Colorado State University 1985; Extension Horticulture Specialist 1998; Senior Extension Educator 2012.

Emeritus/Retired Faculty:

Rollin H. Abernethy, Jack Cecil, James Cook, Ron Delaney, Mark Ferrell, Alan Gray, Robin W. Groose, Bernie Kolp, James M. Krall, Stephen D. Miller, Thomas D. Whitson, David Wilson

Agroecology Major

The Department of Plant Sciences offers a Bachelor of Science degree in Agroecology jointly with the Ecosystem Science and Management Resources, and three minors. Minors offered by Plant Sciences include Agroecology, Horticulture, and Plant Protection. The minor in Horticulture includes courses in plant propagation, organic food production, greenhouse design and management, and introductory horticulture. The minor in Plant Protection includes courses in agronomy, plant genetics, plant pathology, and weed science. These minors allow students within many bachelors programs to obtain an added emphasis in areas that enjoy strong employment opportunities.

A B.S. degree in agroecology prepares students for careers in agriculture, natural resources, environmental and life sciences and for advanced graduate studies in specific subdisciplines within these areas. It is a broad, interdisciplinary, undergraduate curriculum that combines and integrates courses in the

crop, horticulture, disease, weeds, soil, and insect sciences and is supported by a science-based curriculum and general education. Flexibility is built into the agroecology curriculum to readily accommodate students seeking to pursue an emphasis or obtain a minor in a specific discipline. To that end the breadth of the curriculum is balanced with greater depth in biology, chemistry, crop science, entomology, environmental studies, natural resource management, soil science, plant pathology, weed science, horticulture, turf management, pre-veterinary medicine, rangeland ecology and watershed management, animal science, microbiology, and molecular biology. A liberal number of electives permits design of a program that best meets individual career and educational objectives. The agroecology program is well suited for students who possess a strong interest in, and an aptitude for, science, agriculture, the environment, life sciences, or natural resources.

The agroecology core curriculum is comprised of freshman through senior level courses that illustrate dynamic and complex interactions of plants, soils, and plant pests (diseases, insects, weeds) with the environment. Academic training is enhanced with experiential learning through research apprenticeships, internships, field studies, and special agroecology capstone courses. Special emphasis is given to development of critical thinking and communication skills, problem solving and application of science. It is an interdisciplinary program designed to prepare students for “real world” situations.

Agroecology B.S. degree recipients are prepared for careers with private and public institutions and agencies in such areas as: agricultural consulting, production or sales, research, product development, education, extension education, international programs, and scientific and technological support. These careers include but are not limited to: soil scientist, conservationist, entomologist, consultant, plant scientist, integrated pest management specialist, ecologist, research associate or technician, agronomist, biotechnician, and agroecologist. Degree recipients are also prepared for graduate education in biological and environmental sciences.

Course Requirements for Agroecology Majors

Agroecology	22
AECL 1000, 3030, 4990, SOIL 2010, 4140, and 4 hrs from a combination of AECL 4920, 4930 or 4960	

Supporting Science Biology/Genetics.....	25-26
ENTO 1000 or 1001 or ANSC 1010, and AGECE 1010 or 1020 and LIFE 1010, 2023, 3400, and CHEM 1000, 2300	
Math/Statistics	7
MATH 1400, STAT 2050	
Communications	3
COJO 2010	
Agriculture Science Electives.....	9
Select 9 hours of upper division courses from those with the following course prefixes: ANSC (Animal Science), BOT (Botany), ENTO (Entomology), MICR (Microbiology), MOLB (Molecular Biology), PLNT (Plant Sciences), REWM (Rangeland Ecology and Watershed Management), or SOIL (Soil Science).	
Supporting Electives.....	9
Select 9 hours of upper division courses from those with the following course prefixes: AGECE (Agricultural Economics), AECL (Agroecology), ANSC (Animal Science), BOT (Botany), CHEM (Chemistry), COJO (Communication and Journalism), ENR (Environment and Natural Resources), ENTO (Entomology), FDSC (Food Science), GEOG (Geography), GIST (Geospatial Information Science and Technology), LIFE (Life Sciences), MICR (Microbiology), MOLB (Molecular Biology), PATB (Pathobiology), PLNT (Plant Sciences), REWM (Rangeland Ecology and Watershed Management), SOIL (Soil Science), or ZOO (Zoology and Physiology).	
Additional University Studies.....	12
Electives (minimum).....	33
Total	120

Agroecology/Environment and Natural Resources Program (ENR, Plant Sciences, and Ecosystem Science and Management)

Students with an especially strong interest in the environment and natural resources may choose to pursue the B.S. in agroecology/ENR. This degree is offered in conjunction with the Haub School of Environment and Natural Resources. See the ENR Information and Advising Guide for details.

Agroecology Minor**(Plant Sciences & Ecosystem Science and Management)**

Minimum requirements..... 20-21
 AECL 1000; two of the following: SOIL 2010, LIFE 2023, AECL 3030; and 9 additional upper division hours from the following: ENTO, PLNT, and/or SOIL.

Plant Protection Minor**(Plant Sciences)**

Minimum requirements.....17
 AECL 1000, AECL 3030, and 10 additional hours from the following: PLNT 3220, 4000, 4070, and 4120.

Horticulture Minor**(Plant Sciences)**

Minimum requirements.....16
 PLNT 2025 and 2026, and 12 additional hours from the following: PLNT 3000, 3036, 3300, 4120, 4180, 4190, 4200, 4975.

Graduate Study

The Department of Plant Sciences offers curricula leading to the master of science and doctor of philosophy degrees in Plant Sciences. Courses within the department are offered in crop science, horticulture, plant pathology, weed science, and agronomy. Interdisciplinary coursework and research projects are common for Plant Sciences graduate students.

Program Specific Admission Requirements

In addition to university minimum requirements, a majority of the department faculty and department head must approve the admission. To be considered for admission, candidates must establish a faculty member willing to serve as advisor.

In order to apply, please submit the following via the University of Wyoming's online application system (<http://www.uwyo.edu/admissions/apply.html>): a statement of purpose that describes your professional objectives and scientific interests, a current Curriculum Vitae, current academic transcripts, TOEFL scores (if English is not your primary language), and three letters of recommendation. Our regular deadline for fall semester admission is February 15, although we will accept applications any time during the year (including for spring semester admission as well).

Please see the Graduate Admissions and Graduate Student Regulations and Policies entries in the front section of the UW Catalog for more information, or visit UW's Graduate Education website at <http://www.uwyo.edu/uwgrad/>.

Program Specific Graduate Assistantship Information

M.S. assistantships include a stipend, plus tuition and fee waiver, and health insurance. Ph.D. assistantships include a stipend, plus tuition and fee waiver, and health insurance. These assistantships are for the 9-month academic year, but summer support is typically available.

Program Specific Degree Requirements**Master of Science in Plant Sciences****Plan A (thesis)**

Requirements for the master of science degree include 26 hours of coursework beyond the bachelor's degree numbered 4000 or above, 4 hours of thesis research, a research proposal, original research, and oral defense of the thesis.

The M.S. degree is typically completed in two years. The student's coursework is selected to fit the student's individual needs by mutual consultation among the student, his/her major professor, and graduate committee.

Doctoral Program

The requirements for the doctor of philosophy degree include 60 hours of coursework beyond the bachelor's degree numbered 4000 or above, 12 hours of dissertation research, a research proposal, original research, written and oral preliminary exams to be taken when most or all coursework is completed, and an oral defense of the dissertation.

Dissertations may be in a modified journal article format but must meet university formatting requirements.

The student's coursework is selected to fit the student's individual needs by mutual consultation among the student, his/her major professor, and graduate committee.

The student is expected to participate in the usual activities of scientific research such as attending and presenting at research seminars and professional meetings and publishing his/her research.

Agroecology (AECL)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◆Q]).

1000 [CROP/BOT 2000]. Agroecology. 4. [SB,G◆PN] Introduces ecological interactions that affect food producing (agricultural) systems. Lectures and laboratory exercises study the various biological components and the science of sustainable agricultural production. Features differences between developed and developing countries. Explores crises and challenges facing agriculture and global society.

1101. First-Year Seminar. 3. [(none)◆FYS] 2010. Introduction to Soil Science. 3. [SE◆(none)] Introduces soil ecological processes and management in terrestrial environments. Discusses interaction of soil, biological, chemical, morphological, and physical properties with land management in wildland and agricultural ecosystems. Emphasis of the course is on plant response to soil conditions. Cross listed with SOIL 2010. *Prerequisite:* 4 hours of chemistry.

3030 [2030]. Ecological Web: Ecology of Plant Protection. 3. Introduces students to concurrent evolution of crop cultivation and organisms, both plant and animal, that attack them. Provides basic skills necessary to understand ecology and management of economic crop pests. *Prerequisites:* LIFE 1010 and AECL 1000. (Offered fall semester)

4120. Organic Food Production. 3. A complete review of the federal organic production guidelines, methods and applications for organic production facilities, alternative marketing principles, concepts of organic fertilizer use, organic pest control and concepts for using environmentally friendly methods to reduce chemical, petroleum and synthetic inputs for more sustainable crop and livestock agricultural systems. Cross listed with PLNT 4120. *Prerequisite:* 8 hours of LIFE and/or CHEM.

4130. Applied Remote Sensing for Agricultural Management. 3. Covers remote sensing concepts and applications related to croplands, rangelands, forests, and water. Students learn techniques for monitoring plant growth and vigor, monitoring rangelands, distinguishing invasive species, categorizing forest fires, and mapping water bodies. Students integrate remotely sensed data with other geospatial data. Cross listed with RNEW/GIST 4130. *Prerequisites:* QA course and 9 credit hours in student's major field and junior/senior standing.

4400. Invasive Plant Ecology. 3. Ecological impacts of invasive, non-indigenous plant species, the ecological, genetic and evolutionary hypotheses for invasiveness, as well as management strategies for invasive plant species. Dual listed with AECL 5400; cross listed with RNEW 4400. *Prerequisite:* LIFE 3400.

4920 [CROP 4600]. Topics in Agroecology: Research Apprenticeship. 1-2 (Max. 4). Laboratory and/or field research apprenticeship. Emphasizes individual student-faculty interactions on current topics in agroecology. *Prerequisite:* AECL core courses.

4930 [CROP/ENTO/SOIL 4903]. Internship in Agroecology. 1-3 (Max. 6). Provides students with realistic views of crop science, entomology or soil science through practical, as well as work-related, experiences. Provides positive educational experience to supplement formal academic course work. *Prerequisites:* sophomore standing or higher; 2.500 GPA.

4960 [PLPA 4000]. Agroecology Field Studies. 2. Various facets of the agroecosystem are covered by visits to agricultural research stations, agri-businesses, private farms, national monuments, historical sites and Federal Parks. Students are exposed to ongoing sustainable research projects and innovative sustainable farming operations where a variety of cropping systems are utilized. Students are usually exposed to archaeological remains of ancient American Indian farming systems. An 8 day trip. *Prerequisite:* AECL 1000. (Offered as needed)

4990. Agroecology Seminar. 3. [WC♦COM3] Capstone agroecology course for final integration of agroecology courses (AECL 2010, 3030, and LIFE 2023). Provides overall synthesis of these academic subjects following completion of a prescribed senior experience course (AECL 4920 or 4930). (Offered spring semester)

5400. Invasive Plant Ecology. 3. Ecological impacts of invasive, non-indigenous plant species, the ecological, genetic and evolutionary hypotheses for invasiveness, as well as management strategies for invasive plant species. Dual listed with AECL 4400; cross listed with RNEW 5400. *Prerequisite:* LIFE 3400.

Plant Sciences (PLNT)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

1101. First-Year Seminar. 3. [(none)♦FYS]

1150 [CROP 1150]. Pesticide Safety and Application. 1. Introduces various types and safe methods of pesticides application. Subsequent to completion, students may take the certification test administered by the Wyoming Department of Agriculture. Cross listed with ENTO 1150. Offered S/U only.

2025. Horticultural Science. 3. [SB♦PN] Propagation, growth, development and utilization of horticultural plants. Students gain an understanding of plant classification, anatomy, interactions with the environment, production and utilization. *Prerequisites:* AECL 1000 or LIFE 1010.

2026. Horticultural Sciences Laboratory. 1. [SB♦(none)] Offers hands-on experience in many areas of horticulture. Students learn basic horticultural plant structures and functions, propagation methods, growing media and fertilizers, landscaping, pruning, etc. *Prerequisites:* AECL 1000 or LIFE 1010. (Normally offered fall semester)

3000. Irrigated Agriculture. 3. Study of the complexity of plant/soil water relationships and its importance on irrigation. Soil and water relations, reference/crops evapotranspiration and management of the water balance. Principles of chemigation, computer modeling/monitoring included. Methods for irrigation scheduling and the importance of water use efficiency as a strategy for water conservation. Cross listed with SOIL 3000. *Prerequisites:* MATH 1400, SOIL 2010.

3036 [AECL 3036]. Grape Production. 3. Introduces students to the science of viticulture. Topics include grapevine origin and distribution, taxonomy, morphology and physiology, soil and climatic requirements, vineyard establishment, grapevine nutrition, cultural practices, harvesting and post-harvest management. Successful completion will enhance students' knowledge and understanding on grape production and management. *Prerequisite:* PLNT 2025.

3220 [PLPA 3220]. Plant Pathology. 3. Study of plant diseases, their causes, nature and control, as well as pathogen biology. Study of diseases caused by fungi, bacteria, viruses, nematodes, mycoplasma-like organisms, higher plants and abiotic factors on field and vegetable crops, as well as on landscape

plants. Gives students insight into the impact plant diseases have on humans. *Prerequisite:* AECL 1000 or LIFE 1010.

3300. Horticultural Plant Propagation. 3. Emphasis on sexual and asexual propagation of various plants including herbaceous and woody crops. Seed propagation discussions include anatomy, physiology, dormancy, and enhancing seed viability and germination. Asexual propagation discussions center on anatomy and physiology of cuttings, adventitious root formation, budding, grafting, and tissue culture. *Prerequisite:* PLNT 2025. (Normally offered spring semester of even-numbered years)

4000 [PLPA 4000]. Plant Disease Control. 3. Advanced study of plant diseases. Important diseases of field, forage and horticultural crops will be studied. Includes history and current distribution and uses of crops. Emphasis will be placed on pathogen biology and development of integrated disease management. Current and classic research papers on plant disease control will be discussed. Dual listed with PLNT 5000. *Prerequisite:* PLNT 3220. (Normally offered fall semester of even-numbered years)

4020. Sustainable Agriculture. 3. Focuses on the sustainability of agroecosystems and the human communities that maintain them in the context of regional, national and global food and fiber requirements. Topics include: the scale of agriculture, low-input systems, current energy and transportation challenges, markets, and integrated crop and livestock production. Dual listed with PLNT 5020. *Prerequisite:* 8 hours of Life Sciences.

4050. Plant Biotechnology. 3. Introduces students to the science and applications of plant cell, tissue and organ culture, and regeneration. Topics include in vitro techniques used for developing new genotypes. Successful completion will enhance knowledge and understanding of plant tissue culture techniques and their applications in crop improvement. Dual listed with PLNT 5050. *Prerequisites:* LIFE 2023 or equivalent.

4070 [CROP 4070]. Weed Science and Technology. 4. Management and physiological principles involved in control of economically important farm and range weeds. Dual listed with PLNT 5070. *Prerequisite:* AECL 1000, LIFE 1010. (Normally offered fall semester)

4120. Organic Food Production. 3. A complete review of the federal organic production guidelines, methods and applications for organic production facilities, alternative marketing principles, concepts of organic fer-

tilizer use, organic pest control and concepts for using environmentally friendly methods to reduce chemical, petroleum and synthetic inputs for more sustainable crop and livestock agricultural systems. Cross listed with AECL 4120. Dual listed with PLNT 5120. *Prerequisite:* 8 hours of LIFE and/or CHEM.

4180. Greenhouse Crop Production. 4. Production methods for a wide range of herbaceous plants including bedding plants, perennials, vegetables, flowering potted plants, and foliage plants. Emphasis is placed on current production techniques in controlled environments and in the field. Dual listed with PLNT 5180. *Prerequisite:* PLNT 3300. (Normally offered spring semester of odd-numbered years)

4190. Herbs, Spices and Medicinal Plants. 3. Includes the history and importance of herbs, spices, and medicinals; collection of these plants in the wild; botany; chemistry; greenhouse and field production; organic production; harvesting; drying; postharvest operations; legal aspects; and products. Dual listed with PLNT 5190. *Prerequisites:* 8 hrs. LIFE and/or CHEM.

4200. Greenhouse Design and Management. 3. Emphasis on greenhouse structural and functional design concepts of economy, efficiency and energy conservation. Primary emphasis is on the limitations and advantages of greenhouses in the Rocky Mountain region, including alternative energy concepts. The management and operational concerns associated with private, commercial, educational and public greenhouses will be included. Dual listed with PLNT 5200. *Prerequisites:* PLNT 2025 and a USP QA/Q course.

4220. Crop Yield Physiology. 3. Physiological processes underlying crop growth and development. The effect of crop management practices on physiology and yield will also be discussed. *Prerequisites:* AECL 1000; CHEM 1000.

4470 [CROP 4470]. Seed Science and Technology. 3. Presents aspects of seed biology and processing including development, physiology, ecology, germination, viability, dormancy, production, conditioning, storage, certification and marketing. Dual listed with PLNT 5470. *Prerequisite:* 8 hours of plant biology.

4520 [CROP 4520]. Plant Breeding. 3. Principles and methods for genetic improvement of all kinds of plants including agronomic, horticultural, forest and range species. Emphasizes fundamental concepts of quantitative genetics and integration of classical plant breeding with emergent biotechnology. *Prerequisites:* MATH 1000 or statistics course; LIFE 4000. (Normally offered fall semester of odd-numbered years)

4700 [CROP 2200, 3200; PLNT 3200]. Forage Crop Science. 3. The course focuses on major aspects of forage crop production and biology. Cultural practices, adaptation, sustainable agriculture and alternative use, seed production, harvest, livestock utilization and storage of forages. This course will have in-depth emphasis on characteristics of important grasses and legumes and utilization of forages for livestock production. Dual listed with PLNT 5700.

4790 [CROP 4700, 4790]. Topics: _____. 1-4 (Max. 10). Independent study. Dual listed with PLNT 5790. *Prerequisite:* senior standing.

4900. Undergraduate Teaching Practicum. 1-2 (Max. 4). Supervised participation of undergraduates in the teaching of laboratory sections offered by the Department of Plant Sciences. Provides opportunity for students to gain teaching experience in agroecology, horticulture, or life science. *Prerequisites:* AECL 1000 and junior or senior standing.

4975. Problems in Plant Science. 1-2 (Max. 4). Provides an opportunity for students to conduct supervised research on specific topics of interest and importance in crop breeding, genetics, physiology, pathology, ecology and pest management. *Prerequisites:* junior/senior standing with at least 10 hours of agroecology core requirements.

5000. Plant Disease Control. 3. Advanced study of plant diseases. Important diseases of field, forage and horticultural crops will be studied. Includes history and current distribution and uses of crops. Emphasis will be placed on pathogen biology and development of integrated disease management. Current and classic research papers on plant disease control will be discussed. Dual listed with PLNT 4000. *Prerequisite:* PLNT 3220.

5020. Sustainable Agriculture. 3. Focuses on the sustainability of agroecosystems and the human communities that maintain them in the context of regional, national and global food and fiber requirements. Topics include: the scale of agriculture, low-input systems, current energy and transportation challenges, markets, and integrated crop and livestock production. Dual listed with PLNT 4020. *Prerequisite:* 8 hours of Life Sciences.

5050. Plant Biotechnology. 3. Introduces students to the science and applications of plant cell, tissue and organ culture, and regeneration. Topics include in vitro techniques used for developing new genotypes. Successful completion will enhance knowledge and understanding of plant tissue culture techniques

and their applications in crop improvement. Dual listed with PLNT 4050. *Prerequisites:* LIFE 2023 or equivalent.

5070. Weed Science and Technology. 4. Management and physiological principles involved in control of economically important farm and range weeds. Dual listed with PLNT 4070. *Prerequisite:* AECL 1000, LIFE 1010.

5120. Organic Food Production. 3. A complete review of the federal organic production guidelines, methods and applications for organic production facilities, alternative marketing principles, concepts of organic fertilizer use, organic pest control and concepts for using environmentally friendly methods to reduce chemical, petroleum and synthetic inputs for more sustainable crop and livestock agricultural systems. Dual listed with PLNT 4120.

5180. Greenhouse Crop Production. 4. Production methods for a wide range of herbaceous plants including bedding plants, perennials, vegetables, flowering potted plants, and foliage plants. Emphasis is placed on current production techniques in controlled environments and in the field. Dual listed with PLNT 4180. *Prerequisite:* PLNT 3300.

5190. Herbs, Spices and Medicinal Plants. 3. Includes the history and importance of herbs, spices, and medicinals; collection of these plants in the wild; botany; chemistry; greenhouse and field production; organic production; harvesting; drying; postharvest operations; legal aspects; and products. Dual listed with PLNT 4190. *Prerequisites:* 8 hrs. LIFE and/or CHEM.

5200. Greenhouse Design and Management. 3. Emphasis on greenhouse structural and functional design concepts of economy, efficiency and energy conservation. Primary emphasis is on the limitations and advantages of greenhouses in the Rocky Mountain region, including alternative energy concepts. The management and operational concerns associated with private, commercial, educational and public greenhouses will be included. Dual listed with PLNT 4200.

5410. Advanced Crop Physiology and Management. 3. Review and interpretation of current crop management and physiology literature. *Prerequisite:* 6 hours of biochemistry or plant physiology.

5470. Seed Science and Technology. 3. Presents aspects of seed biology and processing including development, physiology, ecology, germination, viability, dormancy, production, conditioning, storage, certification and marketing. Dual listed with PLNT 4470. *Prerequisite:* 8 hours of plant biology.

5500. Clinical Plant Pathology. 2. Designed to give students practical experience in disease diagnosis. Students are exposed to a variety of current techniques used in the diagnosis and control of plant problems caused by abiotic and biotic factors. Primary emphasis is on the identification of biotic agents, including fungi, bacteria, nematodes and viruses. Students will gain experience and insight in the practical aspects of plant pathology. *Prerequisite:* PLNT 4000.

5600. Research in Crops. 1-4 (Max. 10). Investigation of research problems to include a written and oral presentation of results. *Prerequisite:* basic training in the field of problem selected.

5700. Forage Crop Science. 3. The course focuses on major aspects of forage crop production and biology. Cultural practices, adaptation, sustainable agriculture and alternative use, seed production, harvest, livestock utilization and storage of forages. This course will have in-depth emphasis on characteristics of important grasses and legumes and utilization of forages for livestock production. Dual listed with PLNT 4700.

5720. Plant Disease Problems. 1-3 (Max. 10). Biology, epidemiology, and control of specific crop, field and forage diseases. *Prerequisite:* PLNT 3220.

5790. Topics: _____ 1-4 (Max. 10). Independent study. Dual listed with PLNT 4790. *Prerequisite:* graduate standing.

5820. Graduate Seminar. 1 (Max. 6). Discussion in production, physiology, breeding and weed science. *Prerequisite:* basic training in plant sciences.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5980. Dissertation Research. 1-12 (Max. 48). Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate level degree program.

Department of Veterinary Sciences

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Department Head: William W. Laegreid

Professors:

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JONATHAN H. FOX, B.Sc., B.VSc. University of Liverpool, UK 1993; Ph.D. Virginia Tech 2002; Professor of Veterinary Sciences 2016, 2008.

WILLIAM W. LAEGREID, B.S. Washington State University 1980; M.S. Washington State University 1984; D.V.M. Washington State University 1985; Ph.D. Washington State University 1988; Professor, Head of the Department of Veterinary Sciences and Director of the Wyoming State Veterinary Laboratory 2012.

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Associate Professors:

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Assistant Professors:

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JENNIFER L. MALMBERG, B.S. Doane University 2004; M.A. Chadron State University 2013; Ph.D. Colorado State University 2018; Assistant Professor of Veterinary Sciences 2019.

KERRY SONDGEROTH, B.A. University of New Hampshire 1997; D.V.M. Colorado State University 2006; Ph.D. Washington State University 2013; Assistant Professor of Veterinary Sciences 2014.

Adjunct Professor:

GEOFFREY J. LETCHWORTH, B.S. Trinity College 1965; D.V.M. New York State College of Veterinary Medicine 1972; Ph.D. Cornell University 1980; Adjunct Professor of Veterinary Sciences 2001.

Professors Emeritus

E. Lee Belden, Francis D. Galey, Bill Jolley, Merl Raisbeck, Lynn Woodard

The Department of Veterinary Sciences and the Department of Animal Science have combined their efforts to offer B.S., M.S., and Ph.D. degrees in animal and veterinary science (see listing under this title). Several options within the major are available including preveterinary medicine and animal biology. Undergraduate course offerings of the Department of Veterinary Sciences are listed under the title of pathobiology. They were designed to familiarize students with the principles of animal disease and the basic biological and biomedical sciences.

The department operates the Wyoming State Veterinary Laboratory, an animal disease diagnostic laboratory (wyovet.uwyo.edu). This laboratory provides valuable hands-on experience for students interested in laboratory animal care, laboratory procedures, and research. Excellent faculty mentors are available for students interested in preveterinary medicine, microbiology, and animal biology.

Graduate Study

The Department of Veterinary Sciences offers advanced study leading to the master of science and doctor of philosophy in animal and veterinary science. Areas of emphasis include: pathology, molecular diagnostics, bacteriology, virology, parasitology, epidemiology, immunology, and toxicology of wild and domestic animals.

Program Specific Admission Requirements

Open to students with a bachelor of science degree who meet the requirements set forth in this Catalog.

Recommended prerequisites include: chemistry, biochemistry, animal anatomy and physiology, biology, microbiology, and introductory statistics.

Program Specific Degree Requirements

Master of Science

Only offered as Plan A

A minimum of 30 credit hours including 4 thesis hours must be earned in 4000-5999 level courses.

Two semesters of graduate seminar (PATB 5515) and STAT (5050) or their equivalents are required.

The program of study is arranged with the student's graduate committee.

Doctoral Program

A 72 hour program.

Students must meet the university minimum requirements.

Preferred Requirements

Competitive applicants for either degree program will have a GPA 3.250 or higher and high GRE scores (153 verbal, 149 quantitative, 302 total using best composite scores).

Pathobiology (PATB)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦♦Q]).

1001. Discovering Careers in Veterinary Medicine. 1. [I,L♦♦(none)] Career paths open to veterinarians are diverse including private practice, clinical specialties, basic/applied sciences like environmental/public health, preventive medicine, military service, microbiology and research. Additional topics: veterinary college application process, financing veterinary education, personal time /stress management of choosing a career in veterinary medicine and animal health.

1101. First-Year Seminar. 3. [(none)♦♦FYS]
2220. Pathogenic Microbiology. 3. This course serves as an introduction to bacterial pathogenesis and disease using taxonomy and categorical approaches. Material presented in the course includes maintenance, transmission, molecular mechanisms of virulence factors, pathogen-host interactions, disease process,

and treatment and prevention of disease of pathogenic bacteria and fungus. Cross listed with MICR 2220. *Prerequisite:* MICR 2210. (Offered spring semester)

2400. Host Defenses Against Infection. 3. Course content will address history of immunology in the context of infectious diseases, different pathogens and their interaction with higher-order life forms and an introduction of the immune system relevant to protect against invasive microorganisms. Course is appropriate for students majoring in Veterinary Sciences, Microbiology, or other Life Sciences fields. *Prerequisite:* MICR/MOLB 2021, or MICR/MOLB 2240.

4001. Epidemiology (Diseases in Population). 3. Basic epidemiologic concepts and approaches to population problems in medicine, with examples from veterinary and human health. Covers a wide spectrum of topics and introduces practical applications of epidemiology. Dual listed with PATB 5001; cross listed with MICR 4001. *Prerequisite:* STAT 2050 or STAT 2070.

4050. Problems in Animal Disease. 1-4 (Max. 6). Offers opportunity for supervised investigation of animal disease problems involving techniques of bacteriology, mycology, virology, gross pathology, histopathology and/or toxicology. *Prerequisites:* 12 semester hours of biological science and consent of instructor; MOLB 2021 is recommended for most students.

4110. Diseases of Food Animals. 3. Acquaints students with diseases of cattle, sheep, swine and poultry. Dual listed with PATB 5110. *Prerequisite:* LIFE 2022. (Offered fall semester)

4111. Equine Health and Disease. 3. To familiarize students with identification, prevention and treatment of diseases in horses through proper health management techniques. Dual listed with PATB 5111. Cross listed with ANSC 4111. *Prerequisite:* ANSC 1030.

4130. Mammalian Pathobiology. 3. [(none)♦♦COM3] Anatomical basis of disease in mammals. Emphasis on concepts of pathogenesis of disease, and the gross, microscopic and clinicopathological changes associated with lesions: cell injury and death; cellular degeneration; disturbances of growth and circulation; neoplasia; inflammation; and recognition of gross and microscopic tissue changes. Background in immunology will be beneficial. Dual listed with PATB 5130; cross listed with MICR 4130. *Prerequisite:* C or better in LIFE 2022. (Normally offered spring semester)

4140. Principles of Toxicology. 3. Toxicology is the study of poisons, their mechanisms of action and their effects on various organisms including man and domestic animals. Designed to provide students in the life and environmental sciences with an understanding of the principles of toxicology as they apply to animal and human health, food safety and environmental studies. Dual listed with PATB 5140. *Prerequisite:* 9 hours of biological science (e.g., physiology), 4 hours chemistry, 3 hours biochemistry. (Normally offered fall semester of even-numbered years)

4150. Seminar. 1 (Max. 4). Preparation and oral presentation of papers on veterinary sciences topics. S/U Only. *Prerequisites:* 8 hours of biology and consent of instructor.

4170 [4120]. Diseases of Wildlife. 3. Introduction to wildlife diseases of the Rocky Mountain region and North America. Emphasis on infectious, parasitic, traumatic, toxic, and other disease agents with coverage of mechanisms of disease, epidemiology, and disease impacts on wildlife populations and species. Significant discussion of zoonotic diseases and diseases at the wildlife/domestic animal interface. Dual listed with PATB 5170. *Prerequisite:* 12 hours of biological or zoological sciences. (Offered spring semester of even-numbered years)

4220. Molecular Mechanisms of Bacterial Pathogenesis. 3. Intended as a survey of the molecular mechanisms that have evolved in pathogenic bacterial species which result in disease. The broad-scoped objective is to assist students in gaining an understanding of principals and concepts as they apply to common themes of bacterial virulence acting on higher order host organisms. In-class review/discussion of scholarly manuscripts, historical to present day, is paramount in allowing students to gain a better appreciation and comprehension of biological principals and concepts through knowledge of experimental approaches. Cross listed with MICR 4220; dual listed with PATB 5220. *Prerequisites:* PATB/MICR 2220 and statistics (or epidemiology).

4240. Disease Ecology. 3. Introduction to 1) how interactions among species, ecosystems, human systems, and abiotic components of the environment affect patterns and processes of disease, and 2) considerations for coevolution of hosts and pathogens, conservation biology, models used to understand disease dynamics, and approaches to manage and control disease in animals, plants, and humans. Dual listed with PATB 5240. Cross listed with ENR 4240. *Prerequisites:* LIFE 2022 or 2023 and STAT 2050 or 2070.

4320. Problems in Parasitology. 1-3 (Max. 5). Individual laboratory, library or field study of parasites and their host relations. *Prerequisites:* 8 semester hours of biological sciences or 3 semester hours of parasitology and consent of instructor.

4400. Immunology. 4. Biology of immune system; cellular and molecular mechanisms; host resistance to infectious agents; as well as hypersensitivities, autoimmunity, tumor and tissue rejection. Includes laboratory for immunological techniques. Cross listed with MOLB 4400. Dual listed with PATB 5400. *Prerequisites:* MOLB/MICR 2021 or 2240 or PATB 2220, and a minimum grade of C- in MOLB 3000 or MOLB 3610. (Normally offered spring semester)

4500. Veterinary Parasitology. 4. Biology, importance, diagnosis and control of helminth and protozoan parasites of wild and domestic animals. Arthropod vectors and/or intermediate hosts of helminth & protozoan parasites are included. Diagnostic procedures and identification familiarity with agents are emphasized in lab. *Prerequisite:* 8 hours of biological science. (Offered fall semester of even-numbered years)

4710. Medical Virology. 3. Human and animal viruses as biological entities. Methods of study, classification, replication strategies, diagnostic approaches, epidemiology and significance as disease agents. Dual listed with PATB 5710. Cross listed with MICR 4710. *Prerequisite:* MOLB 2240. (Normally offered fall semester)

5001. Epidemiology (Diseases in Population). 3. Basic epidemiologic concepts and approaches to population problems in medicine, with examples from veterinary and human health. Covers a wide spectrum of topics and introduces practical applications of epidemiology. Dual listed with PATB 4001; cross listed with MICR 5001. *Prerequisite:* STAT 2050.

5110. Diseases of Food Animals. 3. Acquaints students with diseases of cattle, sheep, swine and poultry. Dual listed with PATB 4110. *Prerequisite:* LIFE 2022. (Offered fall semester)

5111. Equine Health and Disease. 3. To familiarize students with identification, prevention and treatment of diseases in horses through proper health management techniques. Dual listed with PATB 4111. Cross listed with ANSC 5111. *Prerequisite:* ANSC 1030.

5120. Topics in Pathobiology. 1-4 (Max. 8). Lectures in current pathobiology topics derived from the expertise of the lecturer. *Prerequisite:* 12 hours of biological sciences and consent of instructor.

5130. Mammalian Pathobiology. 3. Anatomical basis of disease in mammals. Emphasis on concepts of pathogenesis of disease, and the gross, microscopic and clinicopathological changes associated with lesions: cell injury and death; cellular degeneration; disturbances of growth and circulation; neoplasia; inflammation; and recognition of gross and microscopic tissue changes. Background in immunology will be beneficial. Dual listed with PATB 4130. *Prerequisites:* C or better in LIFE 2022.

5140. Principles of Toxicology. 3. Toxicology is the study of poisons, their mechanisms of action, and their effects on various organisms including man and domestic animals. Designed to provide students in the life and environmental sciences with an understanding of the principles of toxicology as they apply to animal and human health, food safety and environmental studies. Dual listed with PATB 4140. *Prerequisite:* 9 hrs. biological science (eg. physiology), 4 hrs. chemistry, 3 hrs. biochemistry.

5170. Diseases of Wildlife. 3. Introduction to wildlife diseases of the Rocky Mountain region and North America. Emphasis on infectious, parasitic, traumatic, toxic, and other disease agents with coverage of mechanisms of disease, epidemiology, and disease impacts on wildlife populations and species. Significant discussion of zoonotic diseases and diseases at the wildlife/domestic animal interface. Dual listed with PATB 4170. *Prerequisites:* 12 hours of biological or zoological sciences.

5220. Molecular Mechanisms of Bacterial Pathogenesis. 3. Intended as a survey of the molecular mechanisms that have evolved in pathogenic bacterial species which result in disease. The broad-scoped objective is to assist students in gaining an understanding of principals and concepts as they apply to common themes of bacterial virulence acting on higher order host organisms. In-class review/discussion of scholarly manuscripts, historical to present day, is paramount in allowing students to gain a better appreciation and comprehension of biological principals and concepts through knowledge of experimental approaches. Dual listed with PATB 4220; cross listed with MICR 5220. *Prerequisites:* PATB/MICR 2220 and statistics (or epidemiology).

5240. Disease Ecology. 3. Introduction to 1) how interactions among species, ecosystems, human systems, and abiotic components of the environment affect patterns and processes of disease, and 2) considerations for coevolution of hosts and pathogens, conservation biology, models used to understand disease dynamics,

and approaches to manage and control disease in animals, plants, and humans. Dual listed with PATB 4240. Cross listed with ENR 5240.

5400. Immunology. 4. Biology of the immune system; cellular and molecular mechanisms; host resistance to infectious agents; as well as hypersensitivities, autoimmunity, tumor and tissue rejection. Includes laboratory for immunological techniques. Students are required to complete a term paper and make a presentation. Dual listed with PATB 4400; cross listed with MOLB 5400. *Prerequisites:* MOLB/MICR 2021 or 2240 or PATB 2220, and a minimum grade of C- in MOLB 3000 or MOLB 3610.

5500. Veterinary Parasitology. 4. Biology, importance, diagnosis and control of helminth and protozoan parasites of wild and domestic animals. Arthropod vectors and/or intermediate hosts of helminth & protozoan parasites are included. Diagnostic procedures and identification familiarity with agents are emphasized in lab. *Prerequisite:* 8 hours of Biological Science.

5505. Investigations in Pathobiology. 1-4 (Max. 8). Research involvement in pathobiology to learn laboratory methods, scientific literature, research design and data analysis and presentation. *Prerequisite:* graduate standing and/or consent of instructor and 16 hours of biological sciences.

5510. Introductory Virology. 3. Prokaryotic and eukaryotic viruses as infectious agents and models for modern molecular biology. Examines concepts and principles of pathogenesis, host response and the regulation of virus-host interactions. Genome organization, structure and replication will be examined within the context of the co-evolution of virus and host. Cross listed with MOLB 5510. *Prerequisite:* MOLB 3610 or 4600 plus 4610.

5515. Advanced Seminar in Pathobiology. 1 (Max. 4). Preparation and presentation of research topics in pathobiology with participation in discussions. *Prerequisite:* graduate standing and/or consent of instructor and 16 hours of biological sciences.

5710. Medical Virology. 3. Human and animal viruses as biological entities. Methods of study, classification, replication strategies, diagnostic approaches, epidemiology and significance as disease agents. Dual listed with PATB 4710.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5980. Dissertation Research. 1-12 (Max. 48). Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate level degree program.

Aims and Objectives

The College of Arts and Sciences (A&S) is committed to providing a balanced education that matches cultural breadth with disciplinary depth. Students in the College of Arts and Sciences learn to address complex contemporary problems and to place them in their wider social, historical and ethical contexts. To achieve these goals, degree programs require students to develop expertise in a particular field, gain critical understanding of major areas of human knowledge and select from required courses and free electives to prepare for the challenges of the new century.

A successful student in any of the departments and programs in the College of Arts and Sciences will have an excellent foundation for professional success, graduate study, and a passion for lifelong learning.

Through hands-on research and creative projects (either on faculty projects or independently with faculty guidance and mentoring), fieldwork, internships, and study abroad, students integrate and bring coherence to their classroom learning.

Student Responsibilities

To graduate from the College of Arts and Sciences, students must satisfy all university, college, and major requirements for a given degree. These requirements apply whether the work is taken within the college or transferred from anywhere else within or outside the university (please refer to section below "Acceptance of Transfer Credit").

The college holds students responsible for knowing degree and major requirements and for completing the necessary courses. Students are also expected to know the regulations that govern the academic standards needed to continue study at the university. Students should be aware that changing majors and/or colleges may result in delays in meeting degree requirements and that requirements themselves sometimes change (see "Graduation: Requirements and Procedures" section of this *Catalog*).

Academic Advising

To help plan a program of study, students are assigned an academic adviser by the department/program of their major. Students undecided about a major are advised in the UW Advising, Career, and Exploratory Studies office (222 Knight Hall).

Students should consult regularly with their academic adviser not only for course scheduling, but also to discuss educational and career goals. Faculty and professional advisers can connect students to the many college and university resources to assist undergraduate study. Instructors are also willing to discuss concerns students may have regarding specific courses.

Changing/Declaring a Major or Minor

When ready to declare or change a major, minor, or dual/concurrent major in a department or program in the college, the appropriate form is available from the Office of the Registrar (167 Knight Hall) or the Registrar's Web page. Approval is required from the appropriate department heads/program directors. Departments/programs will assign advisors at the time of signing their approval on the form.

Programs of Study

Undergraduate Degrees

A variety of specialized concentrations are offered within many of the following degree programs. Take a look at the department sections in this *Catalog* that follow this section or the departments' Web sites. Additionally, there are several inter-college or interdisciplinary degrees/majors such as Earth System Science and the affiliated major in Environment and Natural Resources that draw courses from several disciplines. See more detailed descriptions in this *Catalog* or the University of Wyoming home page at www.uwyo.edu, click on the A-Z Directory.

Bachelor of Arts

African American and Diaspora Studies
American Studies
Anthropology
Art
Art Education
Art History
Chemistry
Communication
Criminal Justice

English
French
Gender and Women's Studies
Geology and Earth Sciences
German
History
International Studies
Journalism
Mathematics
Music
Native American and
Indigenous Studies
Philosophy
Physics
Political Science
Religious Studies
Sociology
Spanish
Statistics
Theatre and Dance

Bachelor of Science

Astronomy/Astrophysics
Biology
Botany
Chemistry
Chemistry (ACS approved)
Communication
Environmental Geology/Geohydrology
Geography
Geology
Journalism
Mathematics
Physics
Physiology
Political Science
Psychology
Sociology
Statistics
Wildlife and Fisheries Biology and
Management
Zoology

Bachelor of Fine Arts

Art
Theatre and Dance

Bachelor of Music

Music Education
Music Performance

Graduate Degrees

Master of Arts

American Studies (*interdisciplinary*)
Anthropology
Communication
English

History
 International Studies (*interdisciplinary*)
 Mathematics
 Philosophy
 Political Science
 Psychology
 Spanish

Master of Science

Botany
 Chemistry
 Geology
 Geophysics
 Mathematics
 Natural Science (*interdisciplinary*)
 Physics
 Psychology
 Reproductive Biology
 Statistics
 Zoology and Physiology

Master of Arts in Teaching

History
 Mathematics

Master of Fine Arts in Creative Writing**Master of Music (In Performance)****Master of Music Education****Master of Public Administration****Master of Science in Teaching**

Chemistry
 Mathematics
 Natural Science (*interdisciplinary*)
 Physics

Doctor of Philosophy

Anthropology
 Botany
 Chemistry
 Geology
 Geophysics
 Mathematics
 Physics
 Psychology
 Reproductive Biology
 Statistics
 Zoology and Physiology

Minors in Arts and Sciences

The College of Arts and Sciences offers all university students systematic studies leading to recognized academic minors. Minors are available in all academic programs in the college and in a number of interdisciplinary areas.

A&S minors have two aims: to encourage students to create a focus for their course work outside their major by coordinating their elective studies; and to enhance chances of employment or graduate admission with a formally recognized field of study.

Minors consist of course requirements ranging from 18-24 credit hours of study, typically including significant work at the junior and senior level. A&S departments and programs offering minors and interdisciplinary degrees may have further conditions and restrictions regarding requirements in the minor. To be counted toward a minor, courses must be completed with a grade of C or better.

Students desiring a minor must notify the department in which the minor is offered. Forms for declaring a minor are available in the Office of the Registrar (167 Knight Hall) or on the Registrar's Web page. The department of the minor will assign an adviser.

For a description of the minors in A&S, see department offices or Web sites.

Minors available in the College of Arts and Sciences include:

African American and Diaspora Studies
 Aging Studies
 American Studies
 Anthropology
 Art Department
 Art History
 Ceramics
 Drawing
 Graphic Design
 Metalsmithing
 Museum Studies
 Painting
 Photography
 Printmaking
 Sculpture
 Biology
 Botany
 Chemistry
 Communication and Journalism
 Communication
 Journalism
 Marketing Communication
 Public Relations
 Creative Writing
 Criminal Justice Department
 Criminal Justice
 Prelaw
 English Department
 Literary Studies
 Professional Writing
 Gender and Women's Studies Department
 Gender and Women's Studies
 Queer Studies

Geography
 Geology/Geophysics
 Geology
 History

International Studies Department

Asian Studies
 European Studies
 International Studies

Latina/o Studies

Mathematics

Modern and Classical Languages Department

Chinese
 Classical Civilization
 French
 German
 Japanese
 Latin
 Spanish

Music

Native American and

Indigenous Studies

Paleoenvironmental Studies

(*interdisciplinary*)

Philosophy Department

Environmental Values
 Ethics
 Philosophy

Physics/Astronomy Department

Astronomy
 Physics

Political Science Department

American Politics
 International Relations and
 Comparative Government
 Political Theory
 Public Law

Psychology

Religious Studies

Remote Sensing

Sociology

Statistics

Theatre and Dance Department

Dance
 Theatre

Wildlife and Fisheries Biology
 and Management

Zoology/Physiology Department

Animal and Human Physiology
 Neuroscience
 Zoology

**College Degree Requirements-
The 2015 A&S Core
Bachelor of Arts or Science Programs**

Beginning fall 2015, new university and college general education curricula, the 2015 University Studies Program (USP) and the 2015 A&S Core, were implemented. Refer to the USP section of this *Catalog* for details

regarding University Studies requirements. Students who matriculate for the first time at UW or a Wyoming community college in fall 2015 or after are required to follow both the new USP and A&S Core. Students transferring from a Wyoming community college with an associate's degree and the Wyoming Core completed between May 2013 and fall 2015, may continue to complete the 2003 USP and 2003 A&S Core requirements (if there has been no interruption in their enrollment for a year or more). Students who matriculated at UW or a Wyoming community college prior to fall 2015 and choose the 2015 USP must also complete the 2015 A&S Core requirements. For additional information please refer to the sections in this *Catalog* that describe the university graduation requirements, the 2015 University Studies Program, and the policies for reenrolling at UW after an absence of a year or more.

I. College credit hour requirements

A. Minimum total semester hours 120

B. Upper-division credit requirements (42). Thirty of the 42 hours must be earned from UW. Courses must be taken for a letter grade unless offered for S/U only. This is an all-university requirement for all degree programs and may come from the courses that fulfill the USP, the A&S Core, the major, the minor, and electives.

C. Major field of study (30-60). Credit hours in excess of 60 in the major subject may not be used to satisfy the requirement of 120 hours for graduation. Credits in AS internship, independent study or special topics courses (AS 2400, 2490, 4400, 4500, 4510, 4900, and 4975) may not be used to fulfill these outside the major requirements. At least 30 hours of C grade or better must be earned in the major subject (the major may require more). Courses in the major must be taken for a letter grade unless offered for S/U only.

D. A&S Core requirements (6). Courses must be taken for a letter grade unless offered for S/U only.

All other university and college regulations apply. See "Graduation: Requirements and Procedures" section of this *Catalog* for more information. Graduate level "Enrichment" courses do not count toward the requirements for a bachelor's degree.

II. 2015 A&S Core Curriculum

Graduates of the College of Arts and Sciences are expected to be liberally educated, to have the knowledge and skills to deal with the unexpected, and to see opportunities from multiple perspectives. To develop these abilities, the college faculty implemented the A&S Core.

The approved courses for the following requirements are searchable within WyoRecords under the Browse Classes feature.

- 1. U.S. Diversity (ASD).** This requirement allows students to explore the complexity of cultural identities in the U.S. and interdependence of the cultures. Students will gain an understanding of the influences of categories such as race, class, ethnicity, gender, disability, sexual orientation, religion, and age on American behaviors, institutions, values, and beliefs.
- 2. Global Awareness (ASG).** Because citizens ever more frequently encounter behaviors and practices based on beliefs, conditions, and assumptions different from their own, they need to understand the nature and function of culture. Our students should have an awareness of the multiple links that affect the living conditions and range of action of peoples of the world, including international systems of commerce, art, science, technology, politics, communication, belief, and justice, among other.

College Degree Requirements Prior to Fall 2015 for Continuing and Reenrolling Students

A&S Core requirements for a student continuing a degree program in effect at the time of matriculation at UW are found in the relevant previous *Catalog*. Contact the A&S Advising Center, Ross 6, 766-4013, asadvice@uwyo.edu.

Students who re-enter the university after an absence of a year or more should refer to other sections of this *Catalog* for university policies and procedures. Unless approved otherwise, reenrolling students, after a year's absence, are required to follow the University Studies and A&S Core requirements in effect the semester of their re-enrollment. However, all majors in A&S who have yet to complete the A&S Core, regardless of their initial enrollment, must refer to the current list of approved courses.

Checksheets and lists of courses that satisfy A&S college core requirements are available on the Web at www.uwyo.edu/as or in the A&S Advising Center, Ross 6, 766-4013, asadvice@uwyo.edu.

Departments and programs in the College of Arts and Sciences may require reenrolling students to complete requirements in the major that meet the current expectations of the discipline.

Transfer Students and Acceptance of Transfer Credit

The College of Arts and Sciences and its departments reserve the right to grant transfer credit toward the bachelor's degree only for those courses where a grade of C or better was earned. Students transferring credits from a university or college outside Wyoming with questions about how courses taken elsewhere fulfill the A&S Core may contact the A&S Advising Center, Ross 6, 766-4013, asadvice@uwyo.edu.

Courses Taken for S/U Credit

Students may include up to 20 semester credit hours in free electives with a grade of S as part of the total hours required by the College of Arts and Sciences for graduation. However, no S/U hours may be used to satisfy university and college core general education requirements or major requirements, including the required 42 upper-division credit hours unless the course is offered for S/U grading only.

Students registering in courses for S/U grades are subject to all general regulations.

Concurrent Majors

Students may pursue two or more majors simultaneously. With careful planning, A&S students may be able to use all or most of the free elective hours for requirements in the other majors. Refer also to the section, "Graduation: Requirements and Procedures" in this *Catalog*.

The A&S Core must be met only once by students whose primary major is in the College of Arts and Sciences. Students whose degree programs are in other UW colleges are welcome to earn a concurrent major in A&S. These students do not have to meet the A&S Core requirements. The student earns one degree with one diploma.

Students pursuing a concurrent major must contact both departments involved for assignments to advisers.

Dual Degrees

Students may simultaneously pursue degrees in the same or more than one UW college. In addition to requirements described in the section “Graduation: Requirements and Procedures” in this *Catalog*, students in another UW college who wish to earn a degree from A&S must also complete the A&S Core. A&S students working on dual degrees in the A&S College need to meet the A&S Core just once. A diploma is awarded for each degree.

Each additional degree requires 30 more credit hours added to the 120 credits to the primary degree. Of these 30 credits, 12 have to be at the 3XXX-4XXX levels.

Second Bachelor’s Degrees

For students seeking a second bachelor’s degree in the College of Arts and Sciences whose **first degree is from another university**, the minimum requirements include:

- 30 semester hours earned from the University of Wyoming, 12 of which must be upper division (3XXX-4XXX level) or graduate level (credit by examination does not count as UW hours).
- Completion of the U.S. and Wyoming Constitutions requirement (V courses in the University Studies Program course list in this *Catalog*).
- If the first degree is from an institution where English is not the predominant language, the COM1 and COM2 requirements of the University Studies Program must be completed successfully.
- Students must also meet the 2015 A&S Core requirements.

For students whose **first degree is from UW**:

- The additional required 30 hours (12 of these at the 3XXX-4XXX) are added to the degree requiring the least number of hours. For example, for a first degree A&S requires 120 hours. So the total credits a UW student would have to complete for the second bachelor’s degree is a minimum of 150 credits. Since the University requires a total of 42 upper division hours for a degree, for the second degree from A&S, a UW student would need to earn a total of 54 hours at the 3XXX-4XXX level. For more information, please see the Second Bachelor’s Degree entry in the section, “Graduation: Requirements and Procedures” in this *Catalog*.

- Students whose **first degree is from another UW college** must meet the 2015 A&S Core requirements.
- In situations in which a student is subsequently required to take coursework from another collegiate institution to fulfill major and overall hour requirements for a second degree from the university, the student’s department can ask the Office of the Registrar to load selected courses into the student’s record.

Concurrent Major in Environment and Natural Resources

A student majoring in any A&S department/program may earn a double major by completing the courses required for the Environment and Natural Resource (ENR) program in addition to the requirements in their A&S major and the College A&S Core. The School of ENR Web site, <http://www.uwyo.edu/enr> has detailed information, or contact the School at (307) 766-5080.

Preprofessional Studies

The College of Arts and Sciences prepares students to enter professional schools through preprofessional programs of study described below.

Prelaw Study. Students usually need a bachelor’s degree prior to beginning the study of law. There is no prescribed course of undergraduate study and no restrictions as to the field in which the degree is earned. However, to prepare for this competitive profession, prelaw students are advised to select courses that help to develop those talents and skills essential to the study and practice of law. Logical and critical thinking, conflict evaluation/resolution and effective verbal/nonverbal communication skills are essential. Additionally, students should understand the political, economic, social and cultural institutions and values that characterize human society. Rigorous courses in any discipline increase abilities in these areas. Regardless of the prelaw major, courses in the broad liberal arts--the sciences, social sciences, fine arts and humanities--increase understanding of the public’s diverse interests and backgrounds.

Prelaw students do not have to declare a major at the time of first enrollment if they wish to explore options. Students who are undeclared in the College of Arts & Sciences are assigned advisers in the Advising, Career, and Exploratory Studies office until they decide upon a degree program. Please note that a prelaw minor is available.

In addition to an adviser in the major, prelaw students may contact the designated UW prelaw adviser for assistance in developing a program of study, for career counseling and for guidance in applying to law schools. Contact the A&S Advising Center, Ross 6, 766-4013, asadvice@uwyo.edu for information.

Detailed information about applying to law schools, the Law School Admissions Test (LSAT) and preparation materials, and links to other web sites are at www.LSAC.org.

Library Preprofessional Study. Librarians are information professionals who research, organize, and classify materials so the public can access information. Not only do they work with printed materials, but all the technological advances in digital media such as electronic databases and eBooks. Some librarians focus on teaching the public, scholars, and students how to access and use these materials, while others concentrate on collecting and maintaining these diverse resources. Librarianship offers many career opportunities to people of different academic backgrounds, interests, and talents. Most public, academic, and special libraries require a Master’s degree in library science (MLS).

The degree programs and minors in the College of Arts and Sciences offer the variety of academic preparation expected by accredited library schools in the country. Most of the graduate schools in library science require a bachelor’s degree, a good undergraduate record, and a reading knowledge of a foreign language for admission. The best undergraduate preparation includes a wide range of courses in the sciences, social sciences, and humanities along with a strong concentration in one subject area. The choice of a major will be determined by the student’s academic interest and professional objective. The general education that the University Studies and the A&S Core require provide the well-rounded background graduate schools expect of their MLS candidates.

Additional information about library schools, their requirements, and programs as well as career opportunities may be obtained from the reference desk at Coe Library and the Center for Advising and Career Services. The U.S. Bureau of Labor Statistics “Occupational Outlook Handbook” at www.bls.gov/ooh/ has detailed descriptions of the varied work of librarians, working conditions, employment outlook, and sources for additional information.

Premedical, Predental and Preoptometry Study. Students with the most promise and the best undergraduate preparation have

the competitive advantage in being admitted to these professional programs. These schools are favorably impressed by a broad educational background, including a substantial number of both non-science and science courses; therefore, students are well advised to look beyond the minimum requirements.

Students may select any major in which they are interested. In addition to completing all university, college and departmental requirements, students must include in their curriculum the basic professional school requirements such as courses in biology, chemistry, math, and physics. Professional schools have other specific requirements and students should learn about any additional recommendations from those professional schools in which they are interested. For assistance, contact the Pre-Professional Health Advising office in the College of Health Sciences, 110 Health Sciences, (307) 766-3878, or hsadvise@uwyo.edu.

Common majors in the College of A & S for these preprofessional programs include chemistry, biology, botany, psychology, physiology, and zoology. However, there are preprofessional students in programs as diverse as theatre and dance and anthropology. Students need not declare a major immediately upon first enrollment. Advisers in individual departments can discuss options or if students wish to remain undeclared, they are advised in the UW Advising, Career, and Exploratory Studies office.

Preprofessional assistance is available in the Departments of Chemistry, Physics, Psychology, and Zoology/physiology. The pre-professional advisers in the College of Health Sciences have current information regarding professional school admission requirements, entrance examinations, programs in Western Interstate Commission on Higher Education (WICHE), Wyoming Medical Contract Program WWAMI (affiliated with the University of Washington School of Medicine) and financial assistance for professional education. The honor society for students enrolled in preprofessional studies, Alpha Epsilon Delta, is also administered in the College of Health Sciences. The Web site, <http://www.uwyo.edu/preprof/> includes additional information.

Internships

Many departments in the College of Arts and Sciences offer internships for academic credit, and some provide monetary compensation. Academic internships provide practical, hands-on experience in a professional job set-

ting as a complement to classroom instruction. An internship can provide students with both insight and preparation for future jobs. All internships require a strong background in writing, organizational ability and analytic skills. Junior or senior standing is recommended.

Special Courses (AS)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB↔Q]).

2000 [ENGL 2110]. Study Abroad. 1-18 (Max. 18). Students may register through the University of Wyoming for up to two semesters of academic work abroad with the approval of the academic adviser, head of the major department and coordinator of the Study Abroad Program.

2400. Lower-Division Internship in _____. 1-12 (Max. 12). Allows students to gain hands-on experience that will help to bridge the gap between the theory of academia and the practicality of the work world. Specific arrangements must be made in advance to identify the academic component of the internship and the grading criteria. Planning will involve the internship agency, the student's academic adviser and the associate dean of the college. *Prerequisites:* sophomore standing and the approval of the adviser, head of the major department and an associate dean of A&S.

2490. Special Topics in _____. 1-3 (Max. 6). Courses of broad general appeal and an inter-departmental flavor will be offered from time to time under this title. Permits utilization of unusual faculty expertise and provides highly-specialized and particularly pertinent, timely subject matter. See current class schedule for topics. *Prerequisite:* sophomore standing.

4400. Upper-Division Internship in _____. 1-12 (Max. 12). Permits students to contribute in the areas of their expertise and gain hands-on experience that will help to bridge the gap between academia and the real world of work. Specific arrangements must be made in advance to identify the academic component of the internship and the grading criteria. Such planning will involve the internship agency, the student's academic adviser and the associate dean of the college. *Prerequisites:* approval of adviser, head of the major department and the college advising coordinator.

4900. Special Topics in _____. 1-3 (Max. 6). Courses of broad general appeal and an inter-departmental flavor will be offered from time to time under this title. Permits utilization of unusual faculty expertise and provides highly-specialized and particularly pertinent, timely

subject matter. See current class schedule for topics. *Prerequisite:* junior standing. (Offered based on sufficient demand and resources)

4975. Independent Study. 1-3 (Max. 6). Offers the advanced student the opportunity to pursue an individualized topic of interest with the assistance and direction of an instructor. *Prerequisites:* junior/senior standing and consent of instructor.

The School of Culture, Gender, and Social Justice

African American and Diaspora Studies

108 Ross Hall, (307) 766-2481

Director: Dr. Ulrich Adelt

Web site: www.uwyo.edu/aads

Professors:

JACQUELYN BRIDGEMAN, B.A. Stanford University 1996; J.D. University of Chicago 1999; Professor of Law 2008, 2002.

DARRELL D. JACKSON, B.A. College of William and Mary 1987; J.D. George Mason University School of Law 1990; Ph.D. University of Colorado School of Education 2011; Professor of Law 2018, 2013.

TRACEY OWENS PATTON, B.A. Colorado State University 1993; M.A. 1996; Ph.D. University of Utah 2000; Professor of Communication and Journalism 2012, 2003.

Associate Professor:

ULRICH ADELT, M.A. University of Hamburg, Germany 2000; Ph.D. University of Iowa 2007; Associate Professor of American Studies 2015, 2009.

Assistant Professor:

FREDRICK D. DIXON, B.A. Purdue University 1993; M.A. Northeastern Illinois University 2003; Ph.D. University of Illinois Urbana-Champaign 2018; Assistant Professor of African American and Diaspora Studies 2019.

Associate Academic Professional

Lecturer:

MARY L. KELLER, B.A. Williams College 1987; M.A. Syracuse University 1992; Ph.D. 2002.

Lecturers:

JASMINE AUSTIN, B.A. University of Mary Hardin-Baylor 2013; M.A. University of Wyoming.

JASCHA HERDT, B.A. University of Wyoming; M.A. 2011.

The African American and Diaspora Studies Program, through an interdisciplinary course of study, examines the experiences of African Americans in the United States, in the context of Africa and its Diaspora in Europe and the Americas.

Undergraduate Studies

The population of Black America has nearly doubled in Wyoming since the year 2000. As the population becomes more diverse it is important to provide students with a background in multicultural relations so that they are prepared for the global workforce. We intend to provide students with the necessary knowledge to prepare them to participate in an increasingly interconnected world. Therefore, African American and Diaspora Studies offers a bachelor of arts (B.A.) and an undergraduate minor in African American and Diaspora Studies.

Students may access a copy of the undergraduate major and minor check sheets at www.uwyo.edu/aads/major-minor/index.html.

African American and Diaspora Studies Major

The B.A. in African American and Diaspora Studies consists of 35 credit hours:

- 15 credit hours of core course requirements: AAST 1000, AAST 2240, AAST 2360, AAST 3130, AAST 4975
- 3 credit hours of a lower division (1000- or 2000- level) AAST course (excludes core courses)
- 6 credit hours of upper division (3000- or 4000-level) AAST courses - internships are highly recommended
- 3 credit hours of a lower division or upper division AAST course (excludes core courses)
- 8 credit hours of a single foreign language

African American and Diaspora Studies Minor

The minor in African American and Diaspora Studies consists of 21 credit hours:

- 9 credit hours of core course requirements
- 9 credit hours of electives (excludes core courses)
- 3 credit hours of senior thesis seminar (AAST 4975, Capstone)

Thematic tracks in the major or minor are optional:

- History
- Culture & Aesthetics
- Politics & Law
- Rhetoric & English
- Religion & Philosophy
- Media Studies

At present, no program for graduate degrees in African American and Diaspora Studies is offered; however, some courses may be counted at the graduate level.

African American and Diaspora Studies (AAST)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1000. Introduction to African American Studies. 3. [D◀▶(none)] Surveys African presence in America. Selected teachings are designed to give the student a concise understanding of the heritage of African people in America.

1030. Social Justice in the 21st Century. 3. [I,D◀▶(none)] Appropriate for students interested in diversity and social justice. Topics covered through an interdisciplinary study of people and society range from identity, critical thinking, empowerment, role models, stereotyping, institutional discrimination, and tolerance. The key lynchpin is active participation in the development and maintenance of just communities. Cross listed with NAIS/AMST/WMST/LTST 1030. Enrollment preference will be given to We The People FIG students.

1101. First-Year Seminar. 3. [(none)◀▶FYS]

2240. Introduction to African Studies. 3. [WB◀▶COM2] Confronts African stereotypes by exploring the continent's complex history and current affairs, with the help of different disciplinary perspectives, such as economics, political science, and anthropology. Equipped with the basics, students will be primed to tackle more advanced courses on Africa. Cross listed with INST 2240.

2350. Introduction to African American Literature. 3. [WB,D◀▶(none)] Provides an introduction to the major works of the African American literary tradition. Covering a wide range of fiction, poetry, drama and autobiography, the course introduces students to some of the most exciting works of literature ever to appear in America. Cross listed with ENGL 2350. *Prerequisite:* WA/COM1.

2360. African American History. 3. [CH,D◀▶COM2] Surveys African-American history in America, particularly emphasizing issues of

identity, class, and progress as well as exploring African-Americans' quest for full participation in American life. Cross listed with HIST 2360.

2450. Traditional African Religion. 3. [CH,G◀▶COM2] Surveys traditional religions of Africa, both ancient and contemporary. Cross listed with RELI 2450.

2990. Topics:_____ 1-3 or 3. Accommodates seminar series and/or course offerings including those by interdisciplinary teams and visiting faculty in African American & Diaspora Studies not covered by program courses.

3000. African American Studies in Music. 3. [(none)◀▶H] Surveys African American music from its origins in Africa to current, popular jazz, rock, soul and rap forms.

3010. The African American Aesthetic. 3. Examines interrelationship of the creative process with cultural and philosophical motifs, as well as the spiritual and the artistic amongst African people on the continent and Diaspora. *Prerequisite:* AAST 1000 or any AAST 2000-level course.

3130. Global Impact of African Cultures. 3. Examines concepts of culture and value systems as applied to Africa and African-derived cultures and the impact on civilizations around the globe. Using the lens of the Diaspora, this course examines aspects of African culture on the African continent along with the traditions, experiences, socialization, and histories that continue for dispersed peoples of African descent. *Prerequisite:* AAST 1000 or any AAST 2000-level course.

3260. African Spirits in the New World. 3. [CH,G◀▶H] Begins with Yoruba roots in Africa travels with the African Diaspora focusing on spirit possession in Haitian Vodou, Cuban Santeria, Jamaican Revival Zion, Jamaican Rastafarianism, Brazilian Candomblé, and "Black Church" in the United States using ethnography and postcolonial theory of religious studies. Cross listed with RELI 3260. *Prerequisites:* AAST 1000 or any AAST 2000 level course or RELI 1000.

3670. African Diaspora. 3. [CS,G◀▶(none)] Examines process through which aspects of African culture have endured in Diaspora. Analyzes social relations between Diaspora Africans and non-African populations in N. and S. America, the Caribbean, Britain, Asia and the Mediterranean. Discusses cultural hybridization as a product of culture contact. Cross listed with HIST 3670. *Prerequisite:* AAST 1000, any AAST 2000-level course, or AAST/HIST 2360.

3933. African Philosophy. 3. [(none)◀▶H] Examines the work of philosophers of Africa, of African descent and others who deal with the African diaspora. Topics include the nature

of African philosophy and the African American struggle, African colonialism, philosophy, political philosophy and gender, traditional African thought. Restricted to junior or senior class standing. Cross listed with INST/PHIL 3933. *Prerequisite:* A prior course in AAST, INST or PHIL.

4000. Black Freedom Movement, 1955–Present. 3. [CH,D◀(none)] Presents the struggle of African Americans for self-definition, self-development, and self-determination from the inception of the modern civil rights movements to the contemporary period. *Prerequisite:* 3 hours of AAST courses.

4020. The Black West. 3. [CH,D◀(none)] This course explores the historical experiences and contributions of people of African descent to the American West from their earliest recorded presence in the 16th Century through the present. Cross listed with HIST 4020. *Prerequisites:* AAST 1000, any AAST 2000-level course, junior/senior standing, or three hours of any level of HIST course.

4050. Development, Africa, and Culture. 3. Focuses on the complex and checkered relationships between Western-inspired development and African cultures. Striking a balance among ethnographic case studies, theoretical lenses, and practical implications, understand what Euro-American efforts at foreign development, including contemporary globalization, look like from an African perspective. Provides an understanding of African expectations of development and developers. Dual listed with AAST 5050; cross listed with INST 4050. *Prerequisites:* junior standing and instructor consultation.

4100. African American Religious Culture. 3. [WC,D◀COM3] Mid-level writing-intensive seminar. Comparative study of African American religious celebration, primarily in the context of Afro-Christianity, but touching on Islam, Candomble, “Voodoo,” Santeria, and Rastafarianism. Cross listed with RELI 4100. *Prerequisite:* WB and one of the following: AAST 1000 or any AAST 2000-level course or RELI 1000.

4160. African American Rhetoric. 3. [CH,D◀COM3] African American discourse and its relationship to equality and participation. Through examination of various media, music, speeches, and art this course uses the struggle of African Americans as an instructive exemplar, to come to terms with the philosophical concepts, political issues, moral complexities, and discursive characteristics of African American Rhetoric. Dual listed with AAST 5160; cross listed with COJO 4160. *Prerequisites:* 9 credit hours in AAST or COJO.

4233. Race, Gender, Ethnicity in the Media. 3. [WC,D◀COM3] Examine the role mass media plays in the Black community and other racial, ethnic, gendered, and socioeconomic communities. Students will develop a critical understanding of the way the mass media uses stereotypes and prejudice to influence society’s views about ethnic minorities and women in contemporary United States society. Cross-listed with COJO 4233 and WMST 4233; dual-listed with AAST 5233.

Prerequisites: 3 credit hours in AAST, COJO, or WMST, WB/COM2, and junior standing.
4250 [4200]. The Harlem Renaissance. 3. [D◀(none)] Examines the florescence of African American creativity, centered in Harlem, New York, between the end of World War I and the onset of the Great Depression. This movement had a tremendous impact on African American culture in and outside of the U.S., including Africa and the Caribbean. Dual listed with AMST 5250; cross listed with AMST 4200. *Prerequisites:* AAST 1000, AMST 2010, AMST 2110, any AAST 2000-level course, junior or senior standing, or nine credit hours in any level AMST course.

4260. [4985] Rhetoric and Social Justice. 3. [D◀COM3] Analyzes concepts of ableism, anti-Semitism, heterosexism, racism, sexism, and socioeconomic class through a critical/social construction framework. It attempts to develop a “working” definition of these concepts by analyzing historical and current conceptualizations and identifying marginalization and disenfranchisement as it is woven in the fabric of American society. Dual listed with AAST 5260; cross listed with COJO 4260. *Prerequisites:* Minimum of 9 credit hours in AAST or COJO and junior standing. (Offered spring semester of even-numbered years)

4450. African American Novel. 3. Considers aesthetic dimension and cultural matrix of novels written by Black Americans. Cross list with ENGL 4450. *Prerequisites:* AAST 1000, any AAST 2000 level course, junior/senior standing, six hours of 2000-level literature courses in ENGL.

4455. Slavery and Freedom. 1-4 (Max. 8). [D◀(none)] Students engage in an in-depth study of the literary voices that emerged from the history of enslavement in the Americas from colonial times through the end of Reconstruction in 1877. Dual listed with AAST 5455; cross listed with ENGL 4455. *Prerequisites:* AAST 1000, any AAST 2000-level course, and junior/senior standing, or six credit hours of literature courses in ENGL.

4675. U.S. Women of Color. 3. [D◀(none)] Examines in comparative perspective the social conditions that shape the experiences of

Chicanas/Latinas in the U.S. Students gain an understanding of how the intersection of race, class, gender, and sexuality shape the lived experiences of U.S. women of color through ideological, economic, and political forces. Cross listed with LTST/WMST 4675. *Prerequisite:* junior standing and/or a combination of 3-6 hours of any level of LTST, WMST, or AAST coursework.

4970. Internship in AAST. 1-12. Designed for students to utilize the knowledge and skills obtained in their program of study to be applied at an organization or institution. Students will provide a job description, sign an internship contract, keep daily work journals, provide work samples, submit a paper, and include a final evaluation by their Internship supervisor. *Prerequisite:* 9 hours in AAST courses.

4975. Independent Research. 1-3 (Max. 6). Independent study in African American Studies. *Prerequisites:* AAST 1000 and consent of instructor.

4990. Topics: _____ . 3 (Max. 12). In-depth study of a topic not offered as regular course. *Prerequisite:* COM1.

5050. Development, Africa, and Culture. 3. Focuses on the complex and checkered relationships between Western-inspired development and African cultures. Striking a balance among ethnographic case studies, theoretical lenses, and practical implications, understand what Euro-American efforts at foreign development, including contemporary globalization, look like from an African perspective. Provides an understanding of African expectations of development and developers. Dual listed with AAST 4050; cross listed with INST 5050. *Prerequisites:* junior standing and instructor consultation.

5060. NGOs, Development, and Culture. 3. Non-governmental organizations (NGOs) have grown exponentially in number and are often viewed as the new and best vehicle for international development. By focusing on international non-governmental organizations (INGOs), in the contexts of Western aid to post-colonial societies and the role they play in the international aid system, the course explores INGOs from historical, global, and cultural perspectives. Cross listed with INST 5060. *Prerequisites:* junior standing and instructor permission.

5160. African American Rhetoric. 3. African American discourse and its relationship to equality and participation. Through examination of various media, music, speeches, and art this course uses the struggle of African Americans as an instructive exemplar, to come to terms with the philosophical concepts, political issues, moral complexities, and dis-

cursive characteristics of African American Rhetoric. Dual listed with AAST 4160; cross listed with COJO 5160. *Prerequisites:* 9 credit hours in AAST or COJO.

5190. Dimensions of Racism. 3. Explores the effects of racism on African people in America using an African centered framework. We will look at the ways racism intersects with sexism, classism, and heterosexism/homophobia within the African community both in America and throughout the Diaspora. *Prerequisites:* AAST 1000, any AAST 2000-level course, junior or senior standing, or nine credit hours in any level COJO course.

5250. The Harlem Renaissance. 3. Examines the florescence of African American creativity, centered in Harlem, New York, between the end of World War I and the onset of the Great Depression. This movement had a tremendous impact on African American culture in and outside of the U.S., including Africa and the Caribbean. Dual listed with AMST 4250; cross listed with AMST 4200. *Prerequisites:* AAST 1000, AMST 2010, AMST 2110, any AAST 2000-level course, junior or senior standing, or nine credit hours in any level AMST course.

5233. Race, Gender, Ethnicity in the Media. 3. Examine the role mass media plays in the Black community and other racial, ethnic, gendered, and socioeconomic communities. Students will develop a critical understanding of the way the mass media uses stereotypes and prejudice to influence society's views about ethnic minorities and women in contemporary United States society. Cross-listed with COJO 5233 and WMST 5233; dual-listed with AAST 4233. *Prerequisites:* 3 credit hours in AAST, COJO, or WMST, WB/COM2, and junior standing.

5260. [5985] Rhetoric and Social Justice. 3. Analyzes concepts of ableism, anti-Semitism, heterosexism, racism, sexism, and socioeconomic class through a critical/social construction framework. It attempts to develop a "working" definition of these concepts by analyzing historical and current conceptualizations and identifying marginalization and disenfranchisement as it is woven in the fabric of American society. Dual listed with AAST 4260; cross listed with COJO 5260. *Prerequisites:* graduate standing. (Offered spring semester of even-numbered years)

5455. Slavery and Freedom. 1-4 (Max. 8). Students engage in an in-depth study of the literary voices that emerged from the history of enslavement in the Americas from colonial times through the end of Reconstruction in 1877. Dual listed with AAST 4455; cross listed with ENGL 5455. *Prerequisite:* graduate

status or 12 hours of 3000-4000 level work. **5560. Black Popular Culture. 3.** Approaches African American popular culture from theoretical perspectives which include black feminist, postcolonial, and poststructuralist analyses. Cross listed with AMST 5560. *Prerequisites:* graduate standing; instructor consent for undergraduate students.

Native American and Indigenous Studies

Main Office: 117 Native American Education, Research and Culture Center, (307) 766-6520

Director's Office: Native American Center, (307) 766-6520

Web site: www.uwyo.edu/nais/

Director: Dr. Christopher Caskey Russell

Professor:

ANGELA JAIME, B.A. California State University, Sacramento; M.A. San Francisco State; Ph.D. Purdue University; Professor of Native American and Indigenous Studies 2019, 2004.

Assistant Professor:

JESSICA F. NELSON, B.A. University of Michigan 2006; M.A. University of Arizona 2011; Ph.D. 2018; Assistant Professor of Native American and Indigenous Studies 2019.

Assistant Lecturer:

ROBYN LOPEZ, A.A. Central Wyoming College 2004; B.A. University of Wyoming 2007; M.A. University of Hawai'i at Mānoa; Assistant Lecturer of Native American and Indigenous Studies 2019.

Adjunct Faculty:

(See *Catalog section following name for academic credentials.*)

Pamela Innes, Anthropology

Jeffrey Means, History

Christopher Caskey Russell, English

The Native American and Indigenous Studies offers an academic major at the undergraduate level and a minor at both the undergraduate and graduate level. This interdepartmental course of study examines Native North American cultural and social life, as well as Indigenous cultural and social life globally, including economic, political, and educational systems. Historical and contemporary perspectives of American Indian and global Indigenous experiences are included in this program.

Students may choose a NAIS studies minor to complement a major field of study. Related disciplines include American studies, anthropology, art, ethnic studies, geography, history,

law, music, philosophy, political science, and sociology. A minor in Native American and Indigenous Studies provides excellent preparation for teachers, researchers, social workers, healthcare providers, resource managers, economic developers, and legal practitioners.

NAIS Undergraduate Minor

Students graduating with an undergraduate minor degree in NAIS will be able to: 1) Explain the concept of tribal sovereignty and how tribal sovereignty is both restricted and acknowledged by the federal trust relationship and by relationships with states; 2) Understand the development of modern tribal governments and their functions and importance in contemporary society; 3) Understand and appreciate the roles of history, culture, and politics in the development of tribal world views, world views that relate to modern life and contemporary issues of concern for Native American and Indigenous peoples; 4) Identify historical, cultural, and political diversity and significance in Native oral traditions and written literatures; 5) Recognize stereotypes about Native American and Indigenous peoples and explain why these stereotypes were created and why they are sustained in modern society; and 6) Understand from the perspective of American Indian peoples, historical experiences and contemporary issues in North America.

Minor Requirements

The minor in Native American and Indigenous Studies requires 18 credit hours. Twelve credit hours must come from the following courses, three credit hours must be in either NAIS 1001 or 1350.

- NAIS 1001, Foundations in American Indian Studies
- NAIS 1350, American Indians in Contemporary Society
- NAIS 2210, North American Indians
- NAIS 2290, History of North American Indians
- NAIS 2340, Native American Culture and Literature

Plus six hours of NAIS elective courses.

NAIS Undergraduate Major

In addition to the skills acquired by students who earn an undergraduate minor degree in Native American and Indigenous Studies, students working toward a B.A. in Native American and Indigenous Studies (NAIS) will study tribal governance, literature, history, environment and natural resource management, Native ways of knowing, and indigenous languages. Inherent in this degree's

curriculum and related activities is the expectation that students and faculty will assume an active role in working with and for Indigenous communities. NAIS requires it majors to earn a grade of C or better in all courses taken to fulfill the major.

Major Requirements

9 credit hours of Foundation Courses

Choose from the following:

NAIS 1001, 1350, 2210, or
2290 Core Courses

6 credit hours of elective courses

15 credit hours are required beyond the 9 credits of chosen Foundation Courses:

NAIS 3300
NAIS 4100
NAIS 2340, 2345, 3100, or NAIS 4460
NAIS 3000, 4000, or 4466
NAIS 3200 or 4340
NAIS 3400, 4110, 4200, or 4740

Capstone Internship (4 credit hours)

NAIS 4020 - Internship active participation in and service to an Indigenous community in the U.S. or elsewhere. Internship guidelines.

Indigenous Languages (8 credit hours)

NAIS 1000, 2010, 3010, 4020

42 credit hours total

NAIS Graduate Minor

A graduate minor in Native American and Indigenous Studies is comprised of 12 hours with at least 6 hours at the 5000 level. It is expected that each graduate minor student and his/her graduate committee, at least one member of whom will be from NAIS, will determine the specific courses to be taken. It is recommended that one of the four classes selected be a 3 credit NAIS 5000 Independent Study. This class will provide a research experience in the discipline of Native American and Indigenous studies that may support a master's thesis or doctoral dissertation. The research expectation in NAIS can be satisfied by the 3 credit hour Independent Study and/or by the thesis or doctoral dissertation.

Students graduating with a graduate minor degree in Native American and Indigenous studies will be able to: 1) Make apparent in masters'-level research the interdisciplinary connections between Native American and Indigenous studies and the primary field of graduate study; 2) Integrate American Indian studies research methods with the research methods used in the primary field of graduate study; and 3) Demonstrate in writing the ability to understand a variety of subjects from a tribal perspective.

Teachers of American Indian Children (TIAC) (teaching) Endorsement/UW Certification

Through Distance Education, a Teachers of American Indian Children (TAIC) Endorsement / Graduate Certificate can be earned. This non-degree graduate program certifies that those who complete its five specialized courses possess the attitudes, knowledge, and competence necessary to effectively teach American Indian Children. Upon completion, students receive official recognition of their achievement on their transcripts and an official certificate. Visit the Distance Education Degrees and Programs Website www.uwo.edu/distance/ for more information. All courses are cross-listed with NAIS and EDCL.

An interdepartmental Native American and Indigenous Studies Advisory Committee guides the program's development. The director advises students selecting the NAIS studies major or minor.

Complete information about the Native American and Indigenous Studies undergraduate major, undergraduate minor, and graduate minor is available in the NAIS Program office and on the program Website.

Native American and Indigenous Studies (NAIS)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1001. Foundations in American Indian Studies. 3. [CS,D◀▶(none)] Explains the development of American Indian studies and will show how a variety of disciplines continue to inform this field and interact to facilitate the exploration of its major topics of concern, including Native histories, cultures, and contemporary lives.

1010. Beginning Indigenous Language. 4. Fundamentals of grammar, conversation, composition, and reading. Satisfactory/unsatisfactory only.

1030. Social Justice in the 21st Century. 3. [I,D◀▶(none)] Appropriate for students interested in diversity and social justice. Topics covered through an interdisciplinary study of people and society range from identity, critical thinking, empowerment, role models, stereotyping, institutional discrimination, and tolerance. The key lynchpin is active participation in the development and maintenance of just communities. Cross listed with AAST/

AMST/WMST/LTST 1030. Enrollment preference will be given to "We The People" FIG students.

1350. American Indians in Contemporary Society. 3. [CS,D◀▶(none)] Examines social and cultural issues and concerns of American Indians both on and off the reservations. Additionally, the status of American Indian people within the dominant society and culture will be explored. Cross listed with SOC 1350.

2010. Intermediate Indigenous Language. 4. Second level fundamentals of grammar, conversation, composition, and reading. Satisfactory/unsatisfactory only. *Prerequisites:* NAIS 1010.

2060. Topics. 1-4 (Max. 6). Popular and current topics in American Indian studies.

2210. North American Indians. 3. [CS, D◀▶(none)] Comparative consideration of North American Indian culture areas at European contact period. Cross listed with ANTH 2210.

2290. History of North American Indians. 3. [CH,D◀▶(none)] Studies American Indian history through 500 years and across the continent. Considers Indian political, social, and economic continuity and change. Focuses on how Indian peoples experienced and responded to times of dramatic change. Cross listed with HIST 2290.

2340. Native American Culture and Literature. 3. [CH,D◀▶(none)] Broad cultural study of Native Americans, past and present. Emphasizes folklore and literature. Cross listed with ENGL 2340. *Prerequisite:* WA course.

2345. American Indians in Hollywood Film. 3. [CH,D◀▶(none)] Examines the ways Hollywood films have constructed various forms of racial identity for American Indians. Cross listed with ENGL 2345. *Prerequisite:* WA.

3000. Plains Culture and History. 3. [D◀▶(none)] An ethnohistorical study of those Native peoples inhabiting the Plains region of the U.S. from prehistory to the present. Cross listed with HIST 3000. *Prerequisite:* 6 hours of HIST or NAIS.

3010. Proficient Indigenous Language. 4. Emphasizes the development of listening, speaking, reading, and writing so as to help students function effectively in the tribal cultural context of which the language is a part. Satisfactory/unsatisfactory only. *Prerequisite:* NAIS 2010.

3100. Tribal Literatures of the Great Plains. 3. [WC,D◀▶(none)] Familiarizes students with American Indian literatures of the Great Plains. The Great Plains region is the locus of much historical and contemporary significance in regard to American Indian cultures. The literature of Great Plains Indians allows stu-

dents to confront and reexamine the national narratives surrounding American Indians. Cross listed with ENGL 3100. *Prerequisite:* 6 hours of NAIS or ENGL.

3200. Indigenous Peoples and the Environment. 3. Understand the historical, political, and socio-economic forces that have shaped the relationships of Indigenous peoples to their environments, and be able to discern the similarities and dissimilarities of Indigenous issues across international borders. The course may include a study abroad component. *Prerequisites:* 6 hours NAIS credit.

3300. Federal Indian Law. 3. Survey of law that applies to individual Indians and tribal governments. In particular, explores the legal relationships among, and relative jurisdictions of federal, tribal, and state governments. Specific topics include civil and criminal jurisdiction, taxation, family law, hunting and fishing, and gaming regulations. *Prerequisite:* NAIS 1001 or 1350.

3400. Traditional Ecological Knowledge. 3. [CS,D◀(none)] Description of the interaction between economy, religion, language and the ecosystem for select Indigenous peoples and discussion of the pedagogical methods for preserving their ecological knowledge. An examination of the conflict between contemporary society's demands and preserving traditional society's heritage. Cross listed with GEOG 3400. *Prerequisite:* one course in American Indian culture.

4000. Indians of Wyoming. 3. [D◀(none)] Examines Native American culture in Wyoming from pre-history to the 21st century. Analyzes social, political, and economic developments of Native peoples of Wyoming before, during, and after contact with Europeans. Discusses interaction between these diverse societies and explores the changing relationships between Indians and Euro-Americans through the periods after contact. Cross listed with HIST 4000. *Prerequisite:* 9 hours of HIST or NAIS.

4010. Advanced Indigenous Language. 4. Stresses the usage of language through composition, conversation, oral presentation, and grammar review. Satisfactory/unsatisfactory only. *Prerequisites:* NAIS 3010.

4020. Internship. 1-12 (Max. 12). Requires active participation and service to an Indigenous community or organization in US or elsewhere. A written agreement among the student, the NAIS director or NAIS faculty mentor, and an on-site supervisor is required. NAIS Majors must take at least four credit hours. *Prerequisite:* 9 hours of NAIS courses.

4100. Tribal Government. 3. Examines traditional systems of tribal governance; the establishment of contemporary tribal governments; stakeholders and their goals; factors influencing tribal government operations, including the federal trust relationship, plenary power, tribal federal and tribal-state relations; powers of tribal governments; and the future of tribal governments. *Prerequisite:* 6 hours of NAIS courses, including NAIS 1001, and/or NAIS 1350.

4110. Educational Foundations in American Indian Education. 3. [D◀(none)] Examines cultural, geographical, linguistic, spiritual, political, and societal factors before, during, and after colonization of the Americas. Definitions and day-to-day realities of terms like ethnocentrism, cultural relativism, assimilation, acculturation, and institutional racism. Development of insights into positive teacher-pupil-community relationships that honor culture and language differences and enhance achievement. Dual listed with NAIS 5110; cross listed with EDCE 4110. *Prerequisite:* NAIS 1001 and 15 credit hours of NAIS or EDST.

4200. Indigenous Communities Abroad: International Travel. 4. Devoted to study/travel related to Indigenous peoples abroad. The specific topic will be determined each time the class is offered. Two weeks of international travel will follow sixteen hours of on-campus instruction. *Prerequisites:* 6 credits in NAIS.

4340. Natural Resource Management on Western Reservations. 3. Examines natural resource management techniques on western reservations. Focus is on the management and planning of water, grazing, extractive industries, and forestry. Fieldwork on the Wind River Indian Reservation is included. Cross listed with GEOG 4340. *Prerequisite:* 6 hours of 2000-level NAIS courses.

4360. American Indian Women. 3. Explores the lives of American Indian women in a variety of contexts through time. Complexity and diversity of Indian women's experiences throughout history are emphasized. Concerns Indian women's lives within the reality of European American colonization and its consequences for Indian peoples. Dual listed with NAIS 5360; cross listed with WMST/SOC 4360. *Prerequisite:* 6 hours of 2000-level NAIS courses.

4460. American Indian Literature. 3. [WC◀(none)] Advanced critical study of the history of American Indian literature, emphasizing the authors' views of social change. Cross listed with ENGL 4460. *Prerequisite:* 6 hours of 2000-level literature courses.

4462. American Indian History to 1783. 3. [(none)◀H] Surveys the history of American Indians from the period before contact to the end of the American Revolution. Examines the various contacts between American Indians and Europeans and considers what the American Revolution meant to the continent's Native peoples. Dual listed with NAIS 5462; cross listed with HIST 4462. *Prerequisite:* 9 hours of HIST or NAIS.

4463. American Indian History 1783-1890. 3. [(none)◀H] Surveys the history of American Indians during the era of westward expansion. Examines the impact of American westward movement and also the manifold changes that accompanied Indians moving west. Cross listed with HIST 4463. *Prerequisite:* 9 hours of HIST or NAIS.

4464. American Indians in the Twentieth Century. 3. Surveys the history of American Indians during the 20th century. Examines the development of new cultural, social, and political forms that help create an American Indian identity. Dual listed with NAIS 5464; cross listed with HIST 4464. *Prerequisite:* 9 hours of HIST or NAIS.

4466. American Indian Ethnohistory. 3. Surveys ethnohistorical methods and concepts and provides students concrete opportunities to use these methodologies in writing exercises. American Indian ethnohistory explores Native American experiences within their own cultural contexts. Dual listed with NAIS 5466; cross listed with HIST 4466. *Prerequisite:* 9 hours of HIST, NAIS, or ANTH.

4468. American Indians in the North American West. 3. One of the defining features of the North American West is the presence of American Indians. Through the discussion of varied readings and primary document research, the history of American Indians in the West is examined, with particular emphasis on the Great Plains and California. Cross listed with HIST 4468. *Prerequisite:* 9 hours of HIST or NAIS.

4740. Native American Languages and Cultures. 3. Demonstrates the interrelationship of language and culture in several Native American communities. Examines anthropological and linguistic theories regarding language spread and the peopling of North America, narrative performance, translation, and the connection between linguistic structures and cultural features. Cross listed with ANTH 4740. *Prerequisite:* ANTH 2000 or consent of instructor.

4975. Independent Study. 1-4 (Max. 8). Directed, independent study in American Indian issues with American Indian Studies affiliated

faculty. Students must initiate a project with an appropriate faculty member and have it approved by the program director. Prerequisite: consent of instructor and 6 hours of NAIS.

4990. Special Topics. 1-4 (Max. 9). Current research topics presented by regular and visiting faculty. Prerequisite: 3 hours of NAIS courses.

5000. Independent Study. 1-4 (Max. 4). Conference course to permit students opportunity for directed and independent study in American Indian issues. Prerequisite: graduate standing and consent of instructor.

5110. Foundations of American Indian Education. 3. Examines cultural, geographical, linguistic, spiritual, political, and societal factors before, during, and after colonization of the Americas. Definitions and day-to-day realities of terms like ethnocentrism, cultural relativism, assimilation, acculturation, and institutional racism. Development of insights into positive teacher-pupil-community relationships that honor culture and language differences and enhance achievement. Dual listed with NAIS 4110; cross listed with EDCI 5110. Prerequisite: NAIS 1001 and 15 credit hours of NAIS or EDST.

5121. History and Philosophy of American Indian Education. 3. Addresses the history of Indian education in the U.S. and Canada and examines missionary initiatives, government programs, and tribal efforts. Review of documentary accounts of Native education, review autobiographical accounts of Native teachers and children. Develop insight necessary for development of appropriate teaching methods and materials. Cross listed with EDCI 5121. Prerequisite: post-Baccalaureate status.

5130. Cultural Foundations of American Indian Education. 3. In-depth study and analysis of the educational experiences of American Indians, focusing on contemporary educational issues and experiences, examining the impacts of cultural orientations, stereotypes, bias, and other issues on the educational attainment of American Indian students. Critique instructional practices and programs developed addressing the needs of American Indian students. Cross Listed with EDCI 5130. Prerequisite: post-Baccalaureate status.

5141. Instructional Methods of American Indian Education. 3. Addresses culturally responsive methodologies for teaching American Indian students, reviews documentary accounts of Native education and autobiographical accounts of Native teachers and children, develops appreciation of the complexity and difficulties of Native education. Insight neces-

sary for development of appropriate teaching methods and materials. Cross listed with EDCI 5141. Prerequisite: post-Baccalaureate status.

5360. American Indian Women. 3. Explores the lives of American Indian women in a variety of contexts through time. The complexity and diversity of Indian women's experiences throughout history are emphasized. Concerns Indian women's lives within the reality of European American colonization and its consequences for Indian peoples. Dual listed with NAIS 4360; cross-listed with WMST/SOC 5360. Prerequisite: 6 hours of 2000-level NAIS courses.

5462. American Indian History to 1783. 3. Surveys the history of American Indians from the period before contact to the end of the American Revolution. Examines the various contacts between American Indians and Europeans and considers what the American Revolution meant to the continent's Native peoples. Dual listed with NAIS 4462; cross listed with HIST 5462. Prerequisite: graduate standing.

5464. American Indian History in the 20th Century. 3. Surveys the history of American Indians during the 20th century. Examines the development of new cultural, social, and political forms that help create an American Indian identity. Dual listed with NAIS 4464; cross listed with HIST 5464. Prerequisite: graduate standing.

5466. American Indian Ethnohistory. 3. Surveys ethnohistorical methods and concepts and provides students concrete opportunities to use these methodologies in writing exercises. American Indian ethnohistory explores Native American experiences within their own cultural contexts. Dual listed with NAIS 4466. Prerequisite: graduate standing.

Gender and Women's Studies

108 Ross Hall, (307) 766-2733

FAX: (307) 766-2555

Web site: www.uwyo.edu/gwst

Director: Jacquelyn Bridgeman

Professors:

CATHERINE CONNOLLY, B.S. State University College at Buffalo 1984; M.A. State University of New York at Buffalo 1989; J.D. 1991; Ph.D. 1992; Professor of Sociology and Women's Studies 2004, 1998, 1992.

COLLEEN DENNEY, B.A. Louisiana State University 1981; M.A. 1983; Ph.D. University of Minnesota 1990; Professor of Art 2005, 1990; Professor of Gender and Women's Studies 2009.

Assistant Professor:

BARBARA ELLEN LOGAN, B.A. Queens College CUNY 1986; Ph.D. University of California Santa Cruz 2002; Assistant Professor of Gender and Women's Studies 2018, 2011.

Assistant Lecturer:

ALISON HARKIN, B.A. Trinity College at the University of Toronto 1981; M.A. Athabasca University 2010; Assistant Lecturer of Gender and Women's Studies 2019.

Professor Emeriti:

Susan McKay (Distinguished Professor Emeritus in Gender and Women's Studies)

Adjunct Faculty:

(see department section following name for academic credentials)

Ulrich Adelt, African American and Diaspora Studies, American Studies

Stephanie Anderson, Political Science

Judith Antell, Emeritus, Native American and Indigenous Studies

Cecelia Aragon, Latina/o Studies, Theatre and Dance

Christine Boggs, Distance Education

Christin Covello, Gender and Women's Studies

Susan C. Frye, English

Teena Gabrielson, Political Science

Susanna Goodin, Philosophy

Janice Harris, Emeritus, English

Cynthia Hartung, Psychology

Isadora Helfgott, History

Jeanne Holland, English

Angela Jaime, Native American and Indigenous Studies

Michelle Jarman, WIND

Frieda E. Knobloch, American Studies

Renee Laegreid, History

Noah Novogrodsky, Law

Tracey Patton, African American and Diaspora Studies, Communication and Journalism

Tucker Readdy, Kinesiology and Health

Chian Jones Ritten, Agricultural and Applied Economics

Nancy Shea, Gender and Women's Studies

Nathaniel Smith, Gender and Women's Studies

Lilia Soto, American Studies, Latina/o Studies

Grant Walsh-Haines, Gender and Women's Studies
Rachel Watson, Chemistry, Director, Queer Studies

Advisory Committee:

Stephanie Anderson (Political Science)
 Cecelia Aragon (Latina/o Studies, Theatre and Dance)
 Christine Boggs (Distance Education)
 Alison Harkin (Gender and Women's Studies)
 Cynthia Hartung (Psychology)
 Isadora Helfgott (History)
 Angela Jaime (Educational Studies)
 Michelle Jarman (WIND)
 Renee Laegreid (History)
 Chian Jones Ritten (Agricultural and Applied Economics)

The Gender and Women's Studies Program offers an interdisciplinary course of study that examines the relevance of sex, gender and sexuality in history, societies, and cultures. Students may earn a major, minor, or graduate minor in Gender and Women's Studies, or a minor or graduate minor in Queer Studies. A faculty advisor is assigned to the student upon declaration of a major or minor.

Students graduating with a degree in Gender and Women's Studies will have skills to succeed in a variety of settings indicated by their ability to:

1. conduct interdisciplinary feminist analysis.
2. examine and critique ideological assumptions underlying social institutions and systems of representation, including but not limited to assumptions regarding gender, race, class, nationality, disability, age, and sexual orientation.
3. comprehend the impact of gender on individuals' historical and contemporary agency, and how the ability to express agency has shaped people's lives in various geographical settings.

Major requirements

For the gender and women's studies major, the student must complete 30 credit hours of gender and women's studies courses. All courses must be completed with a grade of "C" or better.

Core Courses (9 credit hours)

1. Introductory Course: (3 credits)
 Choose ONE from:
 - a. WMST 1080: Intro to Women's Studies or
 - b. WMST 2000: Intro to GLBTQ/NS Studies or
 - c. WMST 1900: Women & Leadership
2. Theory/Methods Courses (6 credits)
 - a. WMST 3710: Gender & Humanities or WMST 2500: Gender & Society or WMST 4210: Feminist Research Methods; and
 - b. WMST 4700: Feminist Theories

Free Electives: 21 credit hours.

Students may choose from our full complement of courses to complete their major requirements.

We encourage students to take courses that are history-based, global, and those that address sexuality, ethnicity, and identity. Students have the option to do 21 hours in one of the following areas, in one or more areas, or create an independent path under consultation with the advisor. Possible areas of emphasis include:

Culture and Representation; Science, the Body and Sexualities; Social Policy and Social Justice; Independent Path. (see advisor for list of offerings)

As part of their 21 free elective hours students, with a minimum GPA of 3.300, have the option of pursuing internships (WMST 4970).

Gender and Women's Studies with Honors

Honors in Gender and Women's Studies recognizes academically ambitious students who have excelled in their undergraduate careers, and who are ready for graduate school and/or employment in the public or private spheres. Requirements include an overall minimum GPA of 3.500 and the completion of WMST 4965, Senior Honors Project. Students in UW Honors Program, McNair Scholars Program, or other departments that require completion of an independent research project may dovetail their honors work in GWST with those programs.

For students beginning in Fall 2015, Honors in Gender and Women's Studies requires the completion of 3 semesters of foreign language or sign language, or a concentration in quantitative analysis and research methods, including statistics.

Minor Requirements

For the Gender and Women's Studies minor, students must complete 18 hours of WMST course work including one of the following core courses: WMST 1080, 1900, 2000, 3500, 3710, 4210 or 4700. A minimum of 12 hours of credit in the minor must be exclusive of hours earned in the student's major. Nine of the required hours must be 3000-level or above. All classes for the minor must be completed with a grade of "C" or better.

Minor in Queer Studies

The Queer Studies minor requires the completion of 18 hours of classes, including WMST 2000-Intro to LGBTQ/NS and nine or more credits at the 3000-level or above. Each semester, students, in consultation with a queer studies advisor, will choose elective courses. A capstone project or internship is required but can be variable and determined in consultation with an advisor.

An interdisciplinary, independent Queer Studies advisory committee advises the program on curriculum, scheduling and coordination. A faculty advisor is assigned to the student on declaration of the minor.

The advisory board for the minor includes:

Ulrich Adelt, American Studies
 Christine Boggs, Outreach School
 Cathy Connolly, Gender and Women's Studies
 Susanna Goodin, Philosophy
 Kirsten Havig, Social Work
 Barbara E. Logan, History and Gender and Women's Studies
 Noah Novogrodsky, Law
 Eric Teman, Professional Studies
 Rachel Watson, director,
 Molecular Biology

Graduate Study

Students interested in a graduate minor in Gender and Women's Studies or Queer Studies should contact the Director of the Program for enrollment.

Minor in Gender and Women's Studies

A total of 12 hours of course work is required, including nine hours at the 5000-level and including WMST 5710, Feminist Theoretical Perspectives. When practical, students should include a GWST faculty member on their thesis, dissertation or Plan B committees. Students in professional programs without a culminating research project (or those whose graduate work is outside of GWST) can meet this requirement through alternative means.

Minor in Queer Studies

A graduate minor in Queer Studies requires the completion of 12 hours, including AMST/WMST 5430, Queer Study, a minimum of 6 hours at the 5000+ level, and a capstone experience or independent study. For committee-based degree programs with QS content it is expected that the student will include one committee member from QS.

Gender and Women's Studies (WMST)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

1030. Social Justice in the 21st Century.

3. [I,D♦(none)] Appropriate for students interested in diversity and social justice. Topics covered through an interdisciplinary study of people and society range from identity, critical thinking, empowerment, role models, stereotyping, institutional discrimination, and tolerance. The key lynchpin is active participation in the development and maintenance of just communities. Cross listed with LTST/AAS/AMST/NAIS 1030. Enrollment preference will be given to We The People FIG students.

1080. Introduction to Women's Studies.

3. [CH,D♦H] Introduction to key issues in women's studies. Topical examination of women's participation in, and relationship to, institutions of society, such as family and school, as well as processes and activities, such as work, art, literature and politics in historical and cross-cultural analysis. Cross listed with ENGL 1080.

1101. First-Year Seminar. 3. [(none)♦FYS]**1900 [4510]. Women and Leadership. 3.**

[O,L♦(none)] Students examine theoretical, historical and cultural aspects of leadership, values in leadership, gender differences in leadership styles, and practical applications of leadership skills through oral communication and information literacy. Individual and collaborative work is expected. Cross listed with SOWK 1900.

2000. Introduction to LGBTQ/NS Studies. 2. [C,D♦H]

Lesbian, Gay, Bisexual, Transgender, Queer and New Sexuality Studies (LGBTQ/NS) explores the interdisciplinary study of sexuality and its importance to the organization of social relations and social institutions. Primary among its concerns is the study of the lives, the politics, and the creative work of sexual minorities.

2060. Topics in Women's Studies. 1-4 (Max.

6). Popular and current topics in women's studies.

2070. Gender and Religion. 3. Aims to help students understand how religion constructs and reinforces gender roles in religion and society. Looks at traditional gender roles in Christianity and the transformation they have undergone in the past century or so. Cross listed with RELI 2070.

2389. History of Women in the American West. 3. [D♦(none)]

Surveys the roots of society's marginal historical depiction of women in the American West from the colonial period through the twentieth century. From the perspective of race, class, ethnicity, and gender, the course focuses on the development of a multi-dimensional understanding of women's roles using an interdisciplinary approach. Cross listed with HIST 2389.

2420 [2500]. Women and Politics. 3.

Describes and compares status and political activity of women in America with those of women in other societies in order to explore causes, methods and results of political involvement by women. Cross listed with POLS 2420. *Prerequisite:* POLS 1000 or consent of instructor.

2500 [3500]. Gender and Society. 3.

[WB♦COM2] Examines the social construction of gender using interdisciplinary methods of analysis. The readings and assignments emphasize the importance of denaturalizing the gender stereotypes and norms that impact women's and men's lives. Intersections between gender, race, class, age, and sexual orientation are examined within their cultural contexts. This course will prepare students for advanced work in Gender and Women's Studies. *Prerequisite:* WMST 1080 or cross listed equivalent.

2700. Gender and Disability. 3. [D♦H]

Disability studies draws upon critical theory to investigate disability as a discursive construction. Investigates how intersecting conceptions of disability and gender have shaped cultural meanings and the social positioning of specific groups, especially women with disabilities. Topics include non-normative embodiment, issues of representation and subjectivity, and the politics of health, sexuality, and care. Cross listed with WIND 2700.

3050. Cultures of Nature in the United States. 3.

Uses artistic, philosophical, historical and literary material to investigate how ideas about and representations of nature have changed over time in the U.S. Culminates in an examination of a wide range of contemporary environmental ideas within this broad historical and cultural context. Cross listed with ENR/AMST 3050. *Prerequisite:* 2000-level course in one of the following departments:

AMST, American history, American literature, or a 2000-level course approved for the ENR program.

3200. Perspectives in Chicana Studies 3.

[D♦(none)] An interdisciplinary introduction to the study of the history, culture, gender relations, and contemporary political, economic status of Chicanas/Mexican American women. Examines the origins, development of Chicana studies as a major emphasis in Chicano/Chicana studies. Cross listed with LTST 3200. *Prerequisite:* LTST 1100.

3300. Psychology of Gender. 3.

In this course, we will examine a variety of psychological theories and research on the experiences and behaviors of men and women. We will study attitudes about gender, theories of gender development, and research about similarities and differences between men and women. Cross listed with PSYC 3300. *Prerequisite:* A grade of C or better in PSYC 1000.

3400. Popular Music and Sexualities. 3.

[CH,D♦(none)] Looks at ways in which popular music has intersected with sexual and gendered identities as a means and expression of both oppression and liberation. Cross listed with AMST 3400. *Prerequisite:* WA.

3610. Non-Western Women Writers. 3.

Examines literature written by women in non-western cultures. The geographical region, time period, and genres of literature may vary by semester. Analyzes representations of such topics as family, marriage, sexuality, community, and colonialism as expressed in fiction, drama, literary non-fiction, and/or poetry. *Prerequisites:* ENGL 1010 or WMST 1080; junior standing.

3710. Gender and Humanities. 3.

[CH♦COM2] Explores how men and women are imaged differently, studying the influence of representation on gender (including representations in literature, film, art, popular culture, and/or performance). Sharpens students' ability to analyze texts and images and investigate those texts' messages about gender, sexuality, ethnicity and class. Cross listed with ENGL/ART 3710. *Prerequisite:* WMST 1080 or ENGL 1010. (Offered once a year)

3800. Chicanas/os in Contemporary Society. 3. [CS,D♦(none)]

Focuses on three major movements within the Chicana/o community; labor, nationalism, and feminism. Students will assess these three movements to determine what role they have played in transforming the social conditions and political identity of the Chicana/o and Latina/o population in the US. Cross listed with AMST/LTST 3800. *Prerequisites:* LTST 1100 or WMST 1080 or AMST 2010.

4050. Minority Sexual/Gender Identity Issues in Education. 3. How youth of minority sexual and gender identities have been educated: the challenges they experience in U.S. K-16 schools, the risk factors related to academic success (health, safety, and emotional well being), and strategies to create safe, caring, and inclusive learning environments for all youth. Dual listed with WMST 5050; cross listed with EDCI 4050. *Prerequisites:* completion of WA and WMST 2000 with C or better.

4100. U.S. Latina/o Theater. 3. [CA,D◀(none)] Designed to provide an overview of United States Latina/o Theater. Through a variety of delivery methods, students are instructed on the various categories that directly impact U.S. Latina/o Theater such as political theatre, gay/lesbian theatre, border issues, race, class, gender, and sexuality. Cross listed with LTST 4100. Dual listed with WMST 5100. *Prerequisite:* 6 hours of LTST or WMST.

4175 [4940]. Gender, Women, and Health. 3. [CS,G◀(none)] Focuses on issues of gender, women and health, including the effects of gender bias in medical research and health care practices and policies. Health care issues of specific concern to women, both nationally and internationally will be examined. Dual listed with WMST 5175; cross listed with INST 4175. *Prerequisite:* upper-division standing, lower division social or psychological science course. (Offered every other year)

4200. Gender and Race in the Economy. 3. [D◀(none)] Focuses on the role gender and race play in the economy; specifically the way that gender and race affect economic outcomes for individuals in the United States. Cross listed with AGECE 4200. Dual listed with WMST 5200. *Prerequisites:* AGECE 1020 or equivalent, or SOC 1000, or WMST 1080, and WB.

4210. Feminist Research Methods. 3. Introduces students to feminist methods of research problem formulation, data acquisition, analysis, and presentation of research findings regarding topics related to sex, gender and sexuality. Requires students to participate in research projects. Dual listed with WMST 5210. *Prerequisites:* Nine hours of WMST or permission of the instructor.

4233. Race, Gender, Ethnicity in the Media. 3. [WC,D◀COM3] Examine the role mass media plays in the Black community and other racial, ethnic, gendered, and socioeconomic communities. Students will develop a critical understanding of the way the mass media uses stereotypes and prejudice to influence society's views about ethnic minorities and women in contemporary United States society. Cross-listed with AAST 4233 and

COJO 4233; dual-listed with WMST 5233. *Prerequisites:* 3 credit hours in AAST, COJO, or WMST, WB/COM2, and junior standing.

4240. Global Sex Work and Trafficking. 3. [G◀(none)] Drawing upon case studies from Africa, Asia, the Americas and Europe, this course explores the gendered intersections of power and privilege through the lens of sex work, broadly defined as the exchange of intimacy for something of value, and trafficking, defined as coerced forms of sex work. Dual listed with WMST 5240; cross listed with INST 4240. *Prerequisite:* 3-6 hours of WMST or INST.

4300. The Politics of Sexuality. 3. Addresses issue of how sexuality has become gendered with different meanings for both males and females as to reproductive behavior, especially how women's bodies are defined in sexual terms. *Prerequisite:* WMST 1080, 3500 or 3710. (Offered every other year)

4330. European Gender and Women's History. 3. The experiences of women and the history of gender from the Renaissance through the 19th century. Focuses on the changing notions of the masculine and the feminine through such historical episodes as the Reformation, the Enlightenment, the French Revolution and the Industrial Revolution. Dual listed with WMST 5330. Cross listed with HIST 4330. *Prerequisite:* HIST 1110 or 2110.

4335. Women and Islam. 3. Examines women's lives in Islamic societies from the seventh century to the present in the Middle East and throughout the world. Themes include women's position in Islamic law, society and culture, Western images of Muslim women, veiling and Islamist movements, theoretical readings on power, gender and agency. Cross listed with HIST 4335 and RELI 4335; dual listed with WMST 5335. *Prerequisite:* 9 hours of HIST, WMST, INST, or RELI.

4360. American Indian Women. 3. Explores the lives of American Indian women in a variety of contexts through time. The complexity and diversity of Indian women's experiences throughout history are emphasized. Much of the class concerns Indian women's lives within the reality of European American colonization and its consequences for Indian peoples. Cross listed with NAIS/SOC 4360. *Prerequisite:* 6 hours of 2000-level NAIS classes.

4430. Queer Theory. 3. [(none)◀H] Introduces students to the intellectual lens used to evaluate the messages regarding gender and sexuality of many institutions and the way in which some actual experiences fall out of line with those norms. Dual listed with WMST 5430; cross listed with AMST 4430. *Prerequisite:* Consent of instructor.

4450. Ecofeminism. 3. Focus is on issues of gender, women and ecology. Ecofeminist thinkers argue that there is no liberation for women and no solution to the ecological crisis without a fundamental shift in relationships of domination. Uniting the two movements results in a radical reshaping of modern socio-economic relations. Dual listed with WMST 5450. *Prerequisite:* 6 hours in WMST, PHIL, and/or ENR.

4500. Special Topics in Women's Studies. 1-4 (Max. 12). Presents current research issues by visiting and regular faculty. *Prerequisite:* WMST 1080, 3500, 3710 or consent of instructor.

4540. Women, Crime and the Law. 3. Addresses status of women as offenders and as victims in society and in the criminal justice system. Considers special role of women as professionals in the criminal justice system. Cross listed with CRMJ 4540. *Prerequisite:* ENGL/WMST 1080, WMST/SOC 3500, or CRMJ/SOC 2400. (Offered every other year)

4580. Gender, Global Change, and Development. 3. [CS,G◀(none)] Examines the global intersections of gender and public policy through its analysis of five central themes: [1] international development discourse in practice; [2] feminized labor and migration; [3] women's unequal access to resources (including land ownership and education); [4] agricultural production and sustainability; [5] health, reproduction and mothering. Dual listed with WMST 5580; cross listed with INST 4580. *Prerequisite:* 3-6 hours of WMST or INST courses. (Offered once a year)

4590. Women of India. 3. [G◀(none)] Introduces students to concepts that influence the daily lives of contemporary women from India. Organized around two themes: how women have made history in India, and how today's women are performing, confronting and modifying cultural traditions. *Prerequisites:* WA and a CS or CH course.

4650. Women, Gender & Migration. 3. From an international context and perspective, this course examines the gendered transformations immigrant women experience. Gender, theories of international migration, assimilation, race, ethnicity, and identity transformation serve as categories of analysis. From a cross-discipline comparative approach, we focus on women's lives to examine differences and similarities to complicate notions of immigration. Cross listed with AMST/LTST/INST 4650. Dual listed with WMST 5650. *Prerequisites:* Junior standing and 6 hours of AMST, LTST, INST, and/or WMST coursework or instructor approval.

4675. U.S. Women of Color. 3. [D♦(none)] Examines in comparative perspective the social conditions that shape the experiences of Chicanas/Latinas in the U.S. Students gain an understanding of how the intersection of race, class, gender, and sexuality shape the lived experiences of U.S. women of color through ideological, economic, and political forces. Cross listed with AAST/LTST 4675. *Prerequisite:* junior standing and/or a combination of 3-6 hours of any level of LTST, WMST, or AAST coursework.

4700. Feminist Theories. 3. [WC♦COM3] Surveys contemporary feminist theories and places those theories within the framework of social, literary, and artistic criticism. Uses feminist theories to address questions such as nature of meaning in literature and artistic forms; construction of science; and identity of the individual as these phenomena are affected by gender construction. *Prerequisite:* 12 hours of women's studies. (Offered once a year)

4780. History of Women Artists. 3. Studies documented influence of women as subjects, makers and receivers of art. Emphasizes careers and works of women over a wide range of times and places and under a variety of social circumstances. Greatly emphasizes developments in the twentieth century. Cross listed with ART 4780; dual listed with WMST 5780. *Prerequisites:* ART 2010 or ART 2020 or 3 hours of Women's Studies courses; and WB.

4830. Victorian Women's Lives: Their Art, Literature and Culture. 3. [CA♦(none)] An interdisciplinary approach to the study of women's issues in art, using literary, cultural and sociological texts to enlarge the art historical basis. Topics include "domestic goddess," class issues, racial questions, working women, prostitution, education, marriage and divorce. Cross listed with ART/ENGL 4830, dual listed with WMST 5830. *Prerequisite:* Either ART 2020 or WMST/ENGL 1080. (Offered every other year)

4960. Women's Bodies, Women's Minds. 3. [CS♦(none)] Explores women's physiologic and psychologic development and the influences of patriarchal society upon the interpretation of what constitutes normalcy across the female life cycle. Historical, cultural and contemporary attitudes of the health care system and women's perspectives on menstruation, childbearing, breastfeeding and menopause will be analyzed. *Prerequisite:* upper division status. (Offered every other year)

4965 [4980]. Senior Honors Project. 3. The student consults with the director/faculty supervisor to identify a topic and (a) produces a 30-40 page research paper or (b) a shorter 15-20 page paper plus a creative or service

learning component, showing originality, firm knowledge of the discipline(s), and solid research skills, with a thesis defense as culmination. *Prerequisites:* WMST 4700, or concurrent enrollment with instructor consent, and a 3.500 GPA.

4970 [4000]. Internship. 3 (Max. 12). Students gain practical experience in the application of principles learned in women's studies courses. Students will work with the director of women's studies internships to select a site; will intern approximately ten hours per week in the host organization; and will complete written assignments which reflect the student's work. Offered S/U only. *Prerequisites:* 12 semester hours of WMST coursework, 3.300 GPA and consent of instructor.

4975 [4970]. Independent Studies. 1-4 (Max. 9). Offers the advanced student the opportunity to pursue a topic of interest with the assistance and direction of an instructor in women's studies. *Prerequisite:* 6 hours in women's studies or consent of instructor.

5000. Special Topics. 1-4 (Max. 8). Presents findings from current research and new areas of inquiry into women's studies at the graduate level, by present and visiting faculty. *Prerequisite:* 18 hours of undergraduate women's studies.

5050. Minority Sexual/Gender Identity Issues in Education. 3. How youth of minority sexual and gender identities have been educated: the challenges they experience in U.S. K-16 schools, the risk factors related to academic success (health, safety, and emotional well being), and strategies to create safe, caring, and inclusive learning environments for all youth. Dual listed with WMST 4050; cross listed with EDCI 5050. *Prerequisites:* completion of WA and WMST 2000 with C or better; graduate standing; completion/concurrent enrollment in ADED 5260 or instructor approval.

5100. U.S. Latina/o Theater. 3. [CA,D♦(none)] Designed to provide an overview of United States Latina/o Theater. Through a variety of delivery methods, students are instructed on the various categories that directly impact U.S. Latina/o Theater such as political theatre, gay/lesbian theatre, border issues, race, class, gender, and sexuality. Cross listed with LTST 5100. Dual listed with WMST 4100. *Prerequisite:* 6 hours of LTST or WMST.

5175. Gender, Women & Health. 3. Focuses on issues of gender, women and health, including the effects of gender bias in medical research and health care practices and policies. Health care issues of specific concern to women, both nationally and internationally are examined. *Prerequisites:* upper-division standing, lower division social or psychological science course. Dual listed with WMST 4175.

5200. Gender and Race in the Economy. 3. Focuses on the role gender and race play in the economy; specifically the way that gender and race affect economic outcomes for individuals in the United States. Cross listed with AGECEC 5200. Dual listed with WMST 4200. *Prerequisites:* AGECEC 1020 or equivalent, or SOC 1000, or WMST 1080, and WB.

5210. Feminist Research Methods. 3. Introduces students to feminist methods of research problem formulation, data acquisition, analysis, and presentation of research findings regarding topics related to sex, gender and sexuality. Requires students to participate in research projects. Dual listed with WMST 4210. *Prerequisites:* Nine hours of WMST or permission of the instructor.

5233. Race, Gender, Ethnicity in the Media. 3. Examine the role mass media plays in the Black community and other racial, ethnic, gendered, and socioeconomic communities. Students will develop a critical understanding of the way the mass media uses stereotypes and prejudice to influence society's views about ethnic minorities and women in contemporary United States society. Cross-listed with AAST 5233 and COJO 5233; dual-listed with WMST 4233. *Prerequisites:* 3 credit hours in AAST, COJO, or WMST, WB/COM2, and junior standing.

5240. Global Sex Work and Trafficking. 3. Drawing upon case studies from Africa, Asia, the Americas and Europe, this course explores the gendered intersections of power and privilege through the lens of sex work, broadly defined as the exchange of intimacy for something of value, and trafficking, defined as coerced forms of sex work. Dual listed with WMST 4240; cross listed with INST 5240. *Prerequisite:* 3-6 hours of WMST or INST.

5330. European Gender History. 3. The experiences of women and the history of gender from the Renaissance through the nineteenth century. Focuses on the changing notions of the masculine and the feminine through such historical episodes as the Reformation, the Enlightenment, the French Revolution and the Industrial Revolution. Dual listed with WMST 4330. *Prerequisite:* HIST 1110 or 2110.

5335. Women and Islam. 3. Examines women's lives in Islamic societies from the seventh century to the present in the Middle East and throughout the world. Themes include women's position in Islamic law, society and culture, Western images of Muslim women, veiling and Islamist movements, theoretical readings on power, gender and agency. Dual listed with WMST 4335. *Prerequisite:* graduate standing.

5360. American Indian Women. 3. Explores the lives of American Indian women in a variety of contexts through time. The complexity and diversity of Indian women's experiences throughout history are emphasized. Much of the class concerns Indian women's lives within the reality of European American colonization and its consequences for Indian peoples. Dual listed with WMST 4360; cross listed with SOC 5360. *Prerequisite:* 6 hours of NAIS 2000-level classes.

5430. Queer Theory. 3. Introduces students to the intellectual lens used to evaluate the messages regarding gender and sexuality of many institutions and the way in which some actual experiences fall out of line with those norms. Dual listed with WMST 4430; cross listed with AMST 5430. *Prerequisite:* Consent of instructor.

5450. Ecofeminism. 3. Focus is on issues of gender, women and ecology. Ecofeminist thinkers argue that there is no liberation for women and no solution to the ecological crisis without a fundamental shift in relationships of domination. Uniting the two movements results in a radical reshaping of modern socio-economic relations. Dual listed with WMST 4450. *Prerequisite:* six credits from women's studies, philosophy, and/or ENR.

5500. Readings in Women's Studies. 3. An interdisciplinary course at graduate level focusing on feminist criticism and theory, which draws on current debates in feminist analysis from the general areas of history, literature and social science, to inform students of reformulations of research and unresolved issues. Identical to HIST 5500. *Prerequisite:* graduate standing.

5580. Gender, Global Change, and Development. 3. Examines the global intersections of gender and public policy through its analysis of five central themes: [1] international development discourse in practice; [2] feminized labor and migration; [3] women's unequal access to resources (including land ownership and education); [4] agricultural production and sustainability; [5] health, reproduction and mothering. Dual listed with WMST 4580; cross listed with INST 5580. *Prerequisite:* 3-6 hours of WMST or INST courses. (Offered once a year)

5590. Women of India. 3. Introduces students to concepts that influence the daily lives of contemporary women from India. Organized around two themes: how women have made history in India, and how today's women are performing, confronting and modifying cultural traditions. *Prerequisites:* USP WA class and a CS or CH class.

5650. Women, Gender & Migration. 3. From an international context and perspective, this course examines the gendered transformations immigrant women experience. Gender, theories of international migration, assimilation, race, ethnicity, and identity transformation serve as categories of analysis. From a cross-discipline comparative approach, we focus on women's lives to examine differences and similarities to complicate notions of immigration. Cross listed with AMST/LTST/INST 5650. Dual listed with WMST 4650. *Prerequisites:* Junior standing and 6 hours of AMST, LTST, INST, and/or WMST coursework or instructor approval.

5710. Feminist Theoretical Perspectives. 3. Intensive introduction to the epistemology and application of a wide range of trans-historical, trans-cultural, and trans-national feminist theories. Students will be asked to apply self-selected feminist theories to their own thesis work and graduate fields, as well as to current examples of sex, gender, gender performance, and gendered coding in American media. *Prerequisite:* graduate standing.

5780. History of Women Artists. 3. Studies documented influence of women as subjects, makers and receivers of art. Emphasizes careers and works of women over a wide range of times and places and under a variety of social circumstances. Greatly emphasizes developments in the twentieth century. Dual listed with WMST 4780. *Prerequisites:* ART 2010 or ART 2020 or 3 hours of Women's Studies courses; and WB.

5830. Victorian Women's Lives: Their Art, Literature, and Culture. 3. An interdisciplinary approach to the study of women's issues in art, using literary, cultural and sociological texts to enlarge the art historical basis. Topics include "domestic goddess," class issues, racial questions, working women, prostitution, education, marriage and divorce. Dual listed with WMST 4830; cross listed with ENGL 5830. *Prerequisite:* ART 2020 or ENGL/WMST 1080.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Students are expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5970. Independent Studies. 1-4 (Max. 8). Allows the graduate student to pursue studies in gender issues with the supervision of an instructor from the Women's Studies faculty. *Prerequisite:* graduate standing.

5990. Internship. 1-12 (Max. 12). *Prerequisite:* graduate standing.

Latina/o Studies

108 Ross Hall, (307) 766-4127

Web site: uwyo.edu/ltst

Director: Dr. Lilia Soto

Professor:

CECILIA ARAGON, B.S. McMurry University Texas 1991; M.A. University of New Mexico 1996; Ph.D. Arizona State University 2003; Professor of Theatre and Dance and Latina/o Studies 2017, 2005.

Associate Professor:

LILIA SOTO, B.A. University of California, San Diego 2000; M.A. University of California, Berkeley 2003; Ph.D. 2008; Associate Professor of American Studies and Latina/o Studies 2017, 2010.

Visiting Assistant Professor:

MARGARITA PIGNATARO, B.A. Florida State University; M.A. Arizona State University, Ph.D.; Visiting Assistant Professor of Latina/o Studies 2018.

Adjunct Faculty:

Jennifer Macias, Adrian Molina, Dewey Gallegos, Estella Soto, Macros Martinez

Faculty and Staff Affiliates:

Jacqueline Shinker, Geography
Mark Guiberson, Communication Disorders
Carolyn Larson, History
Conxita Domènch, Spanish Literature
Joy Landeira, Spanish
Irene Checa-Garcia, Spanish Linguistics
Rachel Sanchez, Office of the Registrar

State-Wide Advisory Board:

Connie Coca
Ana Cuprill
Linda Devine
Floyd Esquibel
Mary Elizabeth Galvan
Chris Navarro
Milton Ontiveros
Ann Redman

The Latina/o Studies program, through an interdisciplinary and comparative approach examines the history, cultures, language and contemporary experiences of Mexicans, Mexican-Americans and other Latinos/as in Wyoming, and the United States.

Learning Outcomes

Latina/o Studies courses emphasize perspectives that are historical and contemporary, theoretical and practical, as well as critical and aesthetic. These perspectives help to develop an understanding of oppression and resistance, at the individual, institutional, and ideological levels.

Upon completion of the University of Wyoming Latina/o Studies minor curriculum, students will have an awareness and appreciation for the Latina/o experience. Particularly as the Latina/o experience is expressed in the following concepts and principles of organic insight, relational awareness, historical perspective, power for social change, intersectionality, and aesthetics.

1. *Organic Insight* - The development of a contextual framework for understanding one's own and others' experiences in relation to the Latina/o experience.

2. *Relational Awareness* - The development of a theoretical framework for understanding how institutional social structures impact individuals, families, and communities, and in turn, how individuals, families, and communities impact social structures through resistance, social agency, and change.

3. *Historical Perspective* - The development of a critical historical viewpoint for understanding how struggles around social, economic, and political forces have shaped the traditional and contemporary Latina/o Diaspora.

4. *Power for Social Change* - The development of a critical consciousness, which is necessary for a social praxis that combats oppressive racist ideologies and social structures that perpetuate individual and institutional inequalities.

5. *Intersectionality* - Gaining an awareness of the intersection of race, ethnicity, class, gender, and sexual orientation as it plays out organically, relationally, historically, and politically.

6. *Latina/o Aesthetics* - The development of an appreciation and awareness of the aesthetics evident in Latina/o art, music, theatre, literature, and other artistic expressive forms and styles.

Latina/o Studies Minor

Latina/o Studies offers an undergraduate minor. The minor in Latina/o Studies requires 18 credit hours. Two of those courses (6 hours) must include the required foundation courses, and the remaining courses (12 hours) can be selected from the other areas of studies listed below.

Minor Requirements:

3 hours of Foundation Course

LTST 1300.....3

3 hours of History or Social Science

LTST 2370 or.....3

LTST 2385 or.....3

LTST 3800.....3

3 hours of Culture, Arts, and Humanities

LTST 2360 or.....3

LTST 3560 or.....3

LTST 4100 or.....3

LTST 44703

3 hours of Gender, Race, Class, and Sexuality

LTST 1030 or.....3

LTST 3200 or.....3

LTST 4650 or.....3

LTST 4675.....3

6 hours of Electives (or any courses listed above not yet taken)

LTST 2060 or.....3

LTST 3080 or.....3

LTST 4485 or.....3

LTST 4495 or.....3

LTST 4496 or.....3

LTST 4525 or.....3

LTST 4975 or.....1-3

LTST 4990.....1-3

Latina/o Studies (LTST)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◆Q]).

1030 [CHST 1030]. Social Justice in the 21st Century. 3. [I,D◆(none)] Appropriate for students interested in diversity and social justice. Topics covered through an interdisciplinary study of people and society range from identity, critical thinking, empowerment, role models, stereotyping, institutional discrimination, and tolerance. The key lynchpin is active participation in the development and maintenance of just communities. Cross listed with WMST/NAIS/AAST/AMST 1030. Enrollment preference will be given to We The People FIG students.

1100 [CHST 1100]. Introduction to Chicano Studies. 3. [CS,D◆(none)] Provides a basic understanding of the historical, social, and cultural context of the Mexican American Chicano people. Examines the major theoretical and conceptual frameworks which explain the Mexican American Chicano experience. Examines the comparative relations with other groups and major social and policy issues. Provides an introduction to the conduct of research in field.

1101 [CHST 1101]. First-Year Seminar. 3. [(none)◆FYS]

1300 [CHST 1300]. Introduction to Latina/o Studies. 3. [(none)◆H] The U.S. Latina/o immigrant experience is a particular focus of this course, including its role in the incorporation of Latinos into U.S. society. Through readings, presentations, class discussion, videos, and other activities, students examine historical and contemporary issues affecting Latinos including but not limited to immigration, language, identity, national origin, education, politics, employment, and economic mobility.

2060 [CHST 2060]. Special Topics in..... 3. Special topics course through which regular or visiting faculty can present progress regarding specialized or new topics.

2360 [CHST 2360]. Mexican American Literature. 3. [CH,D◆H] Discusses literary reflections of Chicanismo. Studies literature of the Hispanic Southwest, Mexican American folklore and the Chicano and post-Chicano movement. Cross listed with ENGL 2360. *Prerequisite:* WA.

2370 [CHST 2370]. Chicano History : Origins to 1900. 3. [CS,D◆H] General survey that traces the geographic distribution and historical processes that have shaped the life experiences, socio-economic development and cultural contributions of peoples of Mexican descent in the United States from their indigenous and Hispanic origins to the end of the 19th century. Cross list with GEOG 2370/ HIST 2370.

2385 [CHST 2385]. Chicano History: 1900 to Present. 3. [(none)◆H] General survey of the history of the Mexican American Chicano people in the United States. Examines the origins and development of Mexican Americans, Chicanos through the major historical processes which have shaped their experience. Major themes include multicultural, multi-ethnic context, origins; changing identity, comparative relations to other social, ethnic groups, culture, social structure, politics, economy, immigration, and the influence of United States-Mexico relations. Cross listed with HIST 2385.

3080 [CHST 3080]. Spanish Language in the USA. 3. [(none)◆H] This course studies the Spanish language in its social context as a language of the United States, through concepts such as: social and individual bilingualism, Spanglish, dialects, language contact, borrowings, code switching, language policy, or language ideology. Cross listed with SPAN 3080. *Prerequisite:* SPAN 3050 or SPAN 3060 or instructor's consent.

3200 [CHST 3200]. Perspectives in Chicana Studies 3. [D◀▶H] An interdisciplinary introduction to the study of the history, culture, gender relations, and contemporary political, economic status of Chicanas/Mexican American women. Examines the origins, development of Chicana studies as a major emphasis in Chicano/Chicana studies. Cross listed with WMST 3200. *Prerequisite:* LTST 1100 or junior standing.

3560 [CHST 3560]. Chicano Community Organizations. 3. Introduction to the origins, development and contemporary status of community organizations and service agencies in the Mexican American community in general and in the Wyoming and Rocky Mountain regions. *Prerequisite:* LTST 1100.

3800 [CHST 3800]. Chicanas/os in Contemporary Society. 3. [CS,D◀▶(none)] Focuses on three major movements within the Chicana/o community; labor, nationalism, and feminism. Students will assess these three movements to determine what role they have played in transforming the social conditions and political identity of the Chicana/o and Latina/o population in the US. Cross listed with AMST/WMST 3800. *Prerequisites:* LTST 1100 or WMST 1080 or AMST 2010.

4100 [CHST 4100]. U.S. Latina/o Theater. 3. [CA,D◀▶(none)] Designed to provide an overview of United States Latina/o Theater. Through a variety of delivery methods, students are instructed on the various categories that directly impact U.S. Latina/o Theater such as political theatre, gay/lesbian theatre, border issues, race, class, gender, and sexuality. Cross listed with WMST 4100. Dual listed with LTST 5100. *Prerequisite:* 6 hours of LTST or WMST.

4470 [CHST 4470]. Studies in Chicano Folklore. 3. [CH,D◀▶H] Provides a survey of the origins, development and contemporary folklore of the Mexican American Chicano people of the United States with comparative relation to Mexico and other groups in the United States. Cross listed with ENGL 4470. *Prerequisites:* LTST 1100 and WA.

4485 [CHST 4485]. U.S. Latino Diaspora. 3. Combines classroom activities and a week-long stay abroad in examining the historical creation and contemporary spread of the Latino Diaspora from the Caribbean to the Yucatan and beyond. U.S. Latina/o history, multiculturalism, pan-Latino identity, assimilation, migration trends and natives responses are stressed. Cross listed with HIST/INST 4485. *Prerequisite:* 9 hours of LTST, HIST, and/or INST related coursework.

4496 [CHST 4496]. History of Mexico. 3. Intensive course in Mexican development. Emphasizes the 20th century, especially the Mexican Revolution of 1910, showing how this nation transformed itself into a modern nation-state. Includes diplomatic relations with the U.S., incorporation of Indians, church-state relations, uses of land and other natural resources, role of the military and growth of Mexican nationalism. Cross listed with HIST 4496. *Prerequisite:* 9 hours of HIST or INST. (Normally offered fall semester)

4650 [CHST 4650]. Women, Gender & Migration. 3. From an international context and perspective, this course examines the gendered transformations immigrant women experience. Gender, theories of international migration, assimilation, race, ethnicity, and identity transformation serve as categories of analysis. From a cross-discipline comparative approach, we focus on women's lives to examine differences and similarities to complicate notions of immigration. Cross listed with AMST/INST/WMST 4650. Dual listed with LTST 5650. *Prerequisites:* Junior standing and 6 hours of AMST, LTST, INST, and/or WMST coursework or instructor approval.

4675 [CHST 4675]. U.S. Women of Color. 3. [D◀▶(none)] Examines in comparative perspective the social conditions that shape the experiences of Chicanas/Latinas in the U.S. Students gain an understanding of how the intersection of race, class, gender, and sexuality shape the lived experiences of U.S. women of color through ideological, economic, and political forces. Cross listed with AAST/WMST 4675. *Prerequisite:* junior standing and/or a combination of 3-6 hours of any level of LTST, WMST, or AAST coursework.

4975 [CHST 4975]. Independent Studies. 1-3 (Max 6). Independent study in Chicano studies research. *Prerequisite:* junior standing.

4990 [CHST 4990]. Topics in Chicano Studies. 1-3 (Max 6). A special topics course through which regular and visiting faculty can explore regarding specialized or new research topics regarding Chicano studies. *Prerequisite:* junior standing.

5100 [CHST 5100]. U.S. Latina/o Theater. 3. [CA,D◀▶(none)] Designed to provide an overview of United States Latina/o Theater. Through a variety of delivery methods, students are instructed on the various categories that directly impact U.S. Latina/o Theater such as political theatre, gay/lesbian theatre, border issues, race, class, gender, and sexuality. Cross listed with WMST 5100. Dual listed with LTST 4100. *Prerequisite:* 6 hours of LTST or WMST.

5650 [CHST 5650]. Women, Gender & Migration. 3. From an international context and perspective, this course examines the gendered transformations immigrant women experience. Gender, theories of international migration, assimilation, race, ethnicity, and identity transformation serve as categories of analysis. From a cross-discipline comparative approach, we focus on women's lives to examine differences and similarities to complicate notions of immigration. Cross listed with AMST/INST/WMST 5650. Dual listed with LTST 4650. *Prerequisites:* Junior standing and 6 hours of AMST, LTST, INST, and/or WMST coursework or instructor approval.

Anthropology

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(307) 766-5136

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Web site: www.uwyo.edu/anthropology

Department Chair: Todd Surovell

Professors:

JAMES AHERN, B.A. Beloit College 1991; M.A. Northern Illinois University 1993; Ph.D. University of Michigan 1998; Professor of Anthropology 2014, 2000.

MICHAEL E. HARKIN, B.A. University of North Carolina 1980; M.A. University of Chicago 1984; Ph.D. 1988; Professor of Anthropology 2003, 1993.

ROBERT L. KELLY, B.A. Cornell University 1978; M.A. University of New Mexico 1980; Ph.D. University of Michigan 1985; Professor of Anthropology 1997.

MARCEL KORNFELD, B.A. University of New Mexico 1974; M.A. University of Wyoming 1982; Ph.D. University of Massachusetts-Amherst 1994; Professor of Anthropology 2008, 1996.

MARY LOU LARSON, B.A. University of Wyoming 1976; M.A. University of California-Santa Barbara 1982; Ph.D. 1990; Professor of Anthropology 2007, 1996.

TODD SUROVELL, B.S. University of Wisconsin-Madison 1995; M.A. University of Arizona 1998; Ph.D. 2003; Professor of Anthropology 2015, 2003.

Associate Professors:

PAMELA INNES, B.A. Bryn Mawr College 1986; M.A. University of Oklahoma 1992; Ph.D. 1997; Associate Professor of Anthropology 2007, 2001.

MELISSA S. MURPHY, B.A. Haverford College 1994; Ph.D. University of Pennsylvania 2004; Associate Professor of Anthropology 2014, 2008.

JASON TOOHEY, B.A. University of California Santa Barbara 1995; M.A. California State University Northridge 2000; Ph.D. University of California Santa Barbara 2009; Associate Professor of Anthropology 2017, 2011.

Assistant Professors:

BRIANADOERING, B.A. Barnard College, Columbia University, 2012; M.A. University of Michigan 2016; Ph.D. 2020, Assistant Professor of Anthropology 2020.

ALEXANDRA KELLY, B.A. University of Chicago 2004; M.A. 2005; Ph.D. Stanford University 2014; Assistant Professor of History and Anthropology 2014.

JESSICA NELSON, B.A. University of Michigan 2006; M.A. University of Arizona 2011; Ph.D. 2018; Assistant Professor of School of Culture, Gender, and Social Justice 2019.

Adjunct Faculty:

Adams, Arksey, Clauter, Janković, Karavanić, Kitchell, Lynch, Malloy, Miller, Nicholson, Olujić, Page, Peterson, Pierce, Raguž, Rapson, Rockwell, Walker, Watson

Academic Professional Research Scientist:

Rick Weathermon

Professors Emeriti:

George C. Frison, George W. Gill, Lin A. Poyer, Charles A. Reher, Audrey C. Shalinsky

The department of Anthropology promotes the understanding of humankind from an integrated, holistic approach which examines past, present and future trends in cultural, biological and linguistic diversity and uniformity. Though the department serves undergraduate and graduate majors who will become professional anthropologists or will pursue other related careers, it also provides information to a large number of non-majors and to the larger community regarding cross-cultural issues. Furthermore, because of its commitment to the four field approach including biological anthropology, archaeology, cultural anthropology and linguistic anthropology, the department fosters among its students an awareness of the interrelatedness of scientific concepts, methods and theories, and the humanistic foundation of scientific inquiry. The Department of Anthropology prepares its students both to understand the cultural resources of Wyoming and to participate as informed citizens in an increasingly complex global community.

Undergraduate Major

The Anthropology B.A. program has the following learning outcomes:

1. students demonstrate knowledge about the four fields of anthropology and their interrelationship,

2. students participate in a research experience and understand its process, and
3. students demonstrate ability to analyze and synthesize in relation to anthropological issues or theories.

In addition to university and college requirements listed in this *Catalog*, anthropology majors must complete two semesters of foreign language. ANTH 1100 and ANTH 1300 cannot be used to fulfill the USP PN requirement. Specific requirements for a B.A. in anthropology are ANTH 1100, 1200, 1300, and 2000. Students must complete ANTH 3300 or ANTH 3310. ANTH 3300 and ANTH 3310 require an additional 1 hour of ANTH 4975. Also required are an additional 21 credits of upper division anthropology for a total of 25 upper division (3000+) credits within the major, including at least one course from three different subfields (cultural anthropology, linguistic anthropology, biological anthropology, and archaeology). Courses that can be used to fulfill upper division cultural anthropology are ANTH 4023, 4300, 4310, 4320, 4325, 4330, 4340, 4350, 4380, 4020 (with instructor's consent). Courses that can be used to fulfill upper division linguistic anthropology are ANTH 4024, 4740, 4765, 4775, 4785, 4795, 4020 (with instructor's consent). Courses that can be used to fulfill upper division biological anthropology are ANTH 4022, 4210, 4215, 4220, 4230, 4255, 4260, 4020 (with instructor's consent). Courses that can be used to fulfill upper division archaeology are ANTH 4021, 4110, 4115, 4120, 4125, 4130, 4145, 4150, 4160, 4170, 4175, 4020 (with instructor's consent), or six credits of archaeological field school (ANTH 4140 or 5180). It is recommended that anthropology majors take ANTH 1101 to fulfill the First-Year Seminar requirement, but it is not required that students take this particular First-Year course. It is also recommended but not required that students complete a course in statistics (STAT 2050 or 2070) and a third semester of foreign language. Courses required by the department for the major and minor must be completed with a grade of C- or better.

At the completion of the Bachelor of Arts degree in Anthropology, students will be able to demonstrate knowledge about the four subfields of anthropology and their interrelationships; they will have participated in a research experience and understand its process; and, they will demonstrate ability to analyze and synthesize in relation to anthropological issues or theories.

Undergraduate Minors

The Anthropology undergraduate minor has the following learning outcomes:

1. students learn sufficient subfield information to complement a variety of disciplines,
2. students learn basic methods of the discipline, and
3. students learn basic theories/ types of subfield explanation.

The minor for non-anthropology majors requires two of the introductory courses: ANTH 1100, 1200, 1300, 2000, and 11-12 hours of electives from 2000, 3000, or 4000-level anthropology courses with no more than 3 hours at the 2000-level. See the anthropology web site for more details.

Teacher Education

Anthropology courses may be used to complete part of the requirements for teacher certification in social studies.

Graduate Study

The department offers programs of study leading to Master of Arts and Doctor of Philosophy degrees in Anthropology. Check Anthropology department web pages for any updates.

Program Specific Admission Requirements

Master's Program

The Anthropology M.A. program has the following learning outcomes:

1. students will be able to explain the content of the "four fields" of anthropology and their interrelationship in written and oral formats,
2. students will have experience in original research, and
3. students will develop skills which foster professionalism as related to their chosen field.

Deadline for application is February 15 for the following fall.

See graduate admission requirements.

Submit letter of intent, resume, transcripts, and an optional writing sample as digital documents to the UW online application system. A minimum of three letters of recommendation are required; a standardized recommendation form is provided through the application system.

In the letter of intent, students should describe their research interests, career goals, and how Wyoming's program will help them achieve these goals.

The Department of Anthropology requires that at least two of the recommendation letters be from academic supervisors or instructors.

Students must present evidence of a satisfactory background in anthropology, which should include coursework in all four subfields of Anthropology (socio/cultural, bio/physical, archaeology, and linguistics). Deficiencies in anthropology may require remediation. Students must have three semesters of a single foreign language or equivalent, and one semester of statistics. In those instances in which the undergraduate background of the student is deficient, the department reserves the right to prescribe course work that would correct such deficiencies.

The M.A. program is designed to be completed in two full years of graduate study. Appropriate allowance will be made for part-time students.

Students who graduate with a Master of Arts degree will be able to explain the content of the four fields of Anthropology and their interrelationship in written and oral formats; they will have an experience in original research; and, they will develop skills which foster professionalism in their chosen fields.

Doctoral Program

The Anthropology Ph.D. program has the following learning outcomes:

1. students will have professional and specialized training so they can move into careers in academic or non-academic tracks,
2. students will have a dissertation research experience that results in professional publication(s), thereby contributing to the expansion of knowledge, and
3. students will have practical experience that will promote their movement into professional careers in a reasonable amount of time.

Deadline for application is December 1 for the following fall.

See graduate admission requirements.

Submit letter of intent, resume, transcripts, and an optional writing sample as digital documents to the UW online application system. A minimum of three letters of recommendation are required; a standardized recommendation form is provided through the application system.

In the letter of intent, students should identify whom they would like as their faculty adviser and describe their research interests, career goals, and how Wyoming's program will help them achieve these goals.

Students with a master's degree may apply directly to the Ph.D. program.

Students with a bachelor's degree may apply to the Ph.D. program. If admitted, students are expected to complete the master's degree requirements following the Plan A or Plan B option before formal admission to the Ph.D. program. At the thesis defense or hearing for the Plan B paper, the student will receive a no pass, pass-terminate at the master's degree, or a pass-admit to the Ph.D. program.

Students admitted to the department's M.A. program are not guaranteed admission to the Ph.D. program.

For admission to the Ph.D. program with the Bachelor's degree, students must have course work in the four subfields of anthropology, three semesters of a single foreign language, and statistical competency at either the B.A. or M.A. level. If these are not satisfied, the student's faculty adviser in coordination with the student's graduate committee assigns remedial work as appropriate.

Students who graduate with a Ph.D. in Anthropology will have specialized and professional training so they can move into academic or non-academic tracks; they will have a dissertation experience that results in professional publications; and they will have professional experiences that facilitate their move into careers in a reasonable amount of time.

Program Specific Graduate Assistantships

Doctoral students generally receive two years of assistantships. First semester, first year M.A. students are generally not awarded assistantships; however, the department occasionally does make exceptions. M.A. students are eligible to apply for assistantships beginning in the second semester.

Assistantships are awarded through a departmental application process. An application form, cover letter, and resume are required.

Information and deadlines may be obtained in the department office.

Failure to complete steps in the M.A. program by established deadline (e.g., advisor selection, proposal presentation, etc.) means the student is not eligible for an assistantship. Failure of the Ph.D. preliminary exam means the student is not eligible for an assistantship.

Program Specific Degree Requirements

Master's Program Plan A (thesis)

See university minimum requirements.

Completion, with a grade of "B" or better of a four core-course sequence. This sequence will consist of ANTH 5010, 20th Century Anthropological Theory; ANTH 5015, Archaeological Theory and Method; ANTH 5020, Biological Anthropology; and ANTH 5030, Linguistic Anthropology.

First semester (fall): Students will submit form to the graduate advisor and department head identifying their thesis advisor BEFORE the graduate assistant allocation meeting (mid-late November).

Second semester (spring): Students will work with their advisor to select their committee, which must be formed and on-file in the department office by the end of the semester. During the core classes' final exam periods, students give a presentation to departmental faculty which outlines the general ideas for their proposed thesis.

Third semester (fall): Working closely with their advisor and committee, students complete a detailed prospectus and gain approval from thesis committee for MA thesis topic.

Fourth semester (spring): Thesis is completed and is approved by thesis committee.

Any M.A. student receiving a grade of C or less in two core classes will be expelled from the program.

Second semester research presentations are assessed by all department faculty in attendance at the presentation and evaluations will be given to the student's advisors. It is expected that students will work closely with their advisors to rectify any problems before they complete their thesis prospectus in the third semester.

If not completed prior to admission; three semesters of a single foreign language and one statistics course must be completed.

Plan B (non-thesis)

See university minimum requirements.

All requirements for a Plan A except thesis, if not completed prior to admission; three semesters of a single foreign language and one statistics course must be completed.

Doctoral Program

See university minimum requirements.

After completion of an M.A. program in anthropology.

A minimum of six content courses (18 hours) chosen by the student in conjunction with the student's committee. These courses are normally completed in the first two years of the Ph.D. program. In addition to anthropology courses, the other 4000/5000-level courses outside of the department may be required by the committee or chosen by the student in consultation with their committee.

Two additional courses in their first or second year: ANTH 5880, Professionalism in Anthropology and the two-semester sequence of ANTH 5890, Teaching Anthropology (3 hours total).

Teaching experience, including stand-alone courses, after completion of the first semester of Teaching and Learning (ANTH 5890), as well as teaching assistance to UW faculty members.

Participation in an approved internship experience (6-24 credit hours). Students pursue internships in state and federal agencies, museums, contract archaeology organizations, and other organizations that offer potential career experience.

Committee meeting and successful completion of a dissertation proposal.

Preliminary exams take place after the completion of 18 hours of content courses. ANTH 5880, and Teaching and Learning in Anthropology (ANTH 5890, or other as designated), normally before the end of the second year. If a student does not receive a passing grade on the preliminary exam, it can be repeated once. Failure to pass the preliminary examination the second time results in termination from the anthropology program.

International experience is highly recommended but not required, e.g. pre-dissertation summer fieldwork.

Student maintains a portfolio which documents teaching, internship, and research experience.

Students are encouraged to present papers at professional conferences and submit articles for publication throughout their tenure as a student. After admission to candidacy, the student is expected to research, write, and defend a dissertation based on original research (up to 48 credit hours). Students may either submit a single dissertation or a series of integrated publishable articles (30-40 pages each). The

student's committee must approve this choice and decide on the number, length and content of the articles at the same time, usually at the committee hearing prior to the preliminary exams. For the final submission of the dissertation, the student must also complete an introduction and conclusion to contextualize and synthesize the integrated articles.

Anthropology (ANTH)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1100. Introduction to Biological Anthropology. 4. [SB◀▶PN] Basic concepts relating to the origin, evolution and biological nature of the human species.

1101. First-Year Seminar. 3. [(none)◀▶FYS]

1200. Introduction to Cultural Anthropology. 3. [CS,G◀▶H] Introduction to foreign, especially non-western, cultures through anthropological concepts, films and ethnographies.

1300. Introduction to Archaeology. 3. [CS,G◀▶PN] Explores ways in which prehistoric material remains can provide an understanding of the cultural way of life. General background in archaeological method and theory is used to examine case studies from throughout the world, based on themes such as ceramic technology and artistry development, growth of early civilizations and North American prehistory.

1450. World Archaeology. 3. [CS,G◀▶H] World Prehistory. Recommended for non-majors. A survey of the archaeology of Africa, Asia, Europe, Australia, and the Americas from the evolution of humans to the origins of agriculture to the rise of civilizations such as that of Egypt, China, and Mexico.

2000. Introduction to Linguistic Anthropology. 3. [L◀▶COM2] Demonstrates the interrelationship of language, human biology, and culture at the introductory level. Linguistic anthropological methods and theories are used to examine linguistic behaviors used throughout the world. *Prerequisite:* ANTH 1100, 1200 or 1300.

2200. World Culture. 3. [CS,G◀▶(none)] Provides an understanding of cultural behavior of people in various geographical areas of the world. Students read ethnographies, cultural descriptions of societies, written by cultural anthropologists. (Normally offered at least once a year)

2210. North American Indians. 3. [CS,D◀▶(none)] Comparative consideration of North American Indian culture areas at

European contact period. Cross listed with NAIS 2210. (Offered based on sufficient demand and resources)

2600. Forgotten Africa: Intro to African Civilizations. 3. [(none)◀▶H] This survey course introduces students to African states and empires, dating from classical to modern times. The course challenges depictions of Africa as timeless and underdeveloped within contemporary narratives by highlighting the continent's vibrant cultures, sophisticated technologies, dynamic and complex political systems and participation in long-distance trade. Cross listed with HIST 2600.

2700. Introduction to Museology. 3. [CH◀▶(none)] Explores the historical, cultural, and contemporary roles of museums and preservation institutions in society. Introduces students to the museum professions, collection and exhibition installation strategies, and ethical problems of governance and collection. Field trips to regional collections are included. Cross listed with AMST/ART/HIST 2700.

3015 [2015]. Introduction to the Music of the World's Peoples. 3. [WB,G◀▶(none)] Introduces music of the world's peoples. Students actively study and document living musical traditions and hear, research and study music from a wide variety of geographical areas of the world. Cross listed with MUSC 3015. *Prerequisite:* MUSC 1000.

3300. Ethnographic Methods in Anthropology. 3. [WB◀▶COM3] Introduces anthropology majors to ethnographic fieldwork, the fundamental method in cultural anthropology. Students conduct fieldwork and discuss research problems including ethics and the role of the researcher. Open to students in related fields of humanities and social sciences. *Prerequisite:* ANTH 1200. (Normally offered fall semester)

3310. Introduction to Anthropology Research Methods. 3. Introduces anthropology majors to use of the discipline's scientific method through problem formation, research data acquisition and research techniques used by anthropologists. *Prerequisite:* ANTH 1100, 1200, and 1300. (Normally offered spring semester)

3400. Hunters and Gatherers. 3. [(none)◀▶H] Describes cultural adaptation of hunter-gatherer societies using both the ethnographic and archaeological record from the Arctic to tropical jungles. *Prerequisite:* ANTH 1100, 1200, or 1300. (Offered based on sufficient demand and resources)

3410. Maya, Aztec, and Inca Cultures. 3. An exploration of the early states and empires of the New World through the archaeological record. Compares and contrasts the Aztec,

Maya, and Inca cultures with emphasis placed on origins, political and social organization, ritual beliefs, and reasons for collapse. *Prerequisite:* ANTH 1300.

3420. The Anthropology of Global Issues.

3. Using anthropology's long-term, holistic and comparative approaches, the course examines key global issues, e.g., poverty, war, disease, environmental degradation, and terrorism from an anthropological perspective. Cross listed with INST 3420. *Prerequisite:* ANTH 1200.

4000. Conference. 1-4 (Max. 4). Guided independent study. *Prerequisites:* senior standing and 15 hours in anthropology. (Offered based on sufficient demand and resources)

4010. History of Anthropological Thought.

3. [WC♦(none)] Designed as the capstone course for senior majors. Surveys anthropological theory development. Explores major trends and their relationships. *Prerequisites:* ANTH 1100, 1200, 1300, 3300, and 3310. (Normally taken in student's final semester)

4015. Archaeological Theory and Method.

3. Introduces the students to past and present archaeological theories through a literature survey of significant topics. Addresses questions, such as: How do archaeologists identify and solve problems? What do they perceive to be problems? What is the logic of archaeological arguments? Dual listed with ANTH 5015. *Prerequisites:* ANTH 1200, 1300, 3310, and at least one 4000 regional course.

4020. Seminar. 3-6 (Max. 6). Considers current topics of anthropological interest. May be repeated for a maximum of 6 hours credit when the subject matter of the seminar is different. *Prerequisite:* ANTH 1100, 1200, or 1300. (Offered based on sufficient demand and resources)

4021. Seminar in Archaeology. 3. Considers current topics of archaeological interest. *Prerequisite:* ANTH 1300.

4022. Seminar in Biological Anthropology. 3. Considers current topics of interest within biological anthropology. *Prerequisite:* ANTH 1100.

4023. Seminar in Cultural Anthropology. 3. Considers current topics of interest within cultural anthropology. *Prerequisite:* ANTH 1200.

4024. Seminar in Linguistic Anthropology. 3. Considers current topics of interest within linguistic anthropology. *Prerequisite:* ANTH 2000.

4110. Zooarchaeology I. 3. Introductory level seminar in the archaeological analysis of faunal materials. Emphasis is on identification and curation of bones from archaeological and Late Pleistocene paleontological contexts,

including their use in the interpretation of prehistoric and historic human behavior, the investigation of paleoenvironmental conditions and paleoecological relationships and problem-oriented taphonomic research. Dual listed with ANTH 5110. *Prerequisite:* ANTH 1300.

4115. Lithic Analysis. 3. An overview of the analysis of stone tools and waste flakes from archaeological sites. Emphasizes appropriate use of typology and methods of debitage analysis. Dual listed with ANTH 5115. *Prerequisites:* ANTH 1300 and 9 additional hours in anthropology.

4120. North American Archaeology. 3. Studies North American prehistory from the earliest evidence to historic times. Dual listed with ANTH 5120. *Prerequisite:* ANTH 1300. (Normally offered every third semester)

4125 [4100]. Northwestern Plains Prehistory. 3. Northwestern Plains archaeology from the Paleoindian period to historic contact. A review of important sites and artifact types, ongoing UW research projects, regional and other expressions of ideology, Native American ethnohistory and contemporary perspectives, and historic preservation issues. Dual listed with ANTH 5125. *Prerequisite:* ANTH 1300. (Normally offered every third semester)

4130. Old World Archaeology. 3. Surveys major archaeological sequences of the Old World. Dual listed with ANTH 5130. *Prerequisite:* ANTH 1300. (Normally offered every third semester)

4135. Quantitative Methods in Anthropology. 3. A consideration of the use of quantitative methods in anthropological research, including descriptive and inferential statistics, pattern search, mathematical modeling and computer simulation. Dual listed with ANTH 5135. *Prerequisite:* STAT 2070 or equivalent.

4140. Archeological Field School. 2-6 (Max. 6). Summarizes a regional prehistory and gives practical and theoretical training in archaeological field methods. Field projects are located specific areas of the world (e.g., Wyoming, Croatia, Peru). *Prerequisite:* ANTH 1300 or 4120 or 4125 or 4130 or 4150. (Normally offered summer session)

4145. Origins of the State. 3. This course takes a comparative approach to the study of the origins of the archaic states. Focus is given to themes in complexity such as emergence of social economic inequality, private property, power, ideology, and urbanism. Comparative civilizations/regions include China, Mesopotamia, Egypt, Central Mexico, and Peru. Dual listed with ANTH 5145. *Prerequisite:* ANTH 1300.

4150. Seminar in Prehistory. 1-3 (Max. 9). Covers the prehistory of a specified region or time period within that region. Emphasizes learning prehistoric sequences, material culture, and research questions associated with the topic. Topics include, but are not limited to, Paleoindian, Archaic, Siberian, Northern Plains, Great Basin, Rocky Mountain, or Southwestern Archaeology. Dual listed with ANTH 5150. *Prerequisite:* ANTH 1300.

4155. Computer Programming for Archaeologists. 3. Introduces the application of computer programming to the collection, management, and analysis (hypothesis testing) of archaeological data. Develop models and simulations of complex prehistoric systems. Begins with an introduction to Microsoft Excel (Visual Basic for Applications), programming structure, and applications to archaeology. Specific assignments in writing programs relevant to typical archaeological problems. Dual listed with ANTH 5155. *Prerequisites:* ANTH 1300 or consent of instructor.

4160. GIS in Anthropology. 4. Introduction to how and why geographic information systems (GIS) are used in anthropology. Considers: 1) background, definitions, and concepts of geographic data and GIS; 2) Anthropological and archaeological approaches to GIS; and 3) hands-on-experience with GIS applications in archaeology through demonstrations, lectures, and structured inquiries. Dual listed with ANTH 5160. *Prerequisites:* ANTH 1200, or 1300.

4170. Geoarchaeology. 3. Introduces students to theory and method in geoarchaeological research. Emphasis is placed upon geomorphical processes of archaeological site formation and paleoenvironmental reconstruction. Dual listed with ANTH 5170. *Prerequisite:* ANTH 1300.

4175. South American Prehistory. 3. Intensive study of the archaeology of South America covering its entire prehistory from first peopling at perhaps 14,000 years ago, to the colonial period. The course focuses not only on the well known Andean cultures, but also on the archaeology of the entire continent. Dual listed with ANTH 5175. *Prerequisite:* ANTH 1300.

4190. Public Archaeology. 3. A consideration of archaeological legislation, policies and regulations; compliance, heritage, and avocational archaeology, cultural resource management; curation; and professional archaeological ethics. Dual listed with 5190.

4210. Human Osteology. 3. Provides a detailed study of the human skeleton. Dual listed with ANTH 5210. *Prerequisite:* ANTH 1100, LIFE 2022. (Normally offered spring semester)

4215 [4200]. Hominin Evolution. 3. Surveys hominin fossil record in context of evolutionary process, stressing structure-function and the dynamics of adaptive responses. Dual listed with ANTH 5215. *Prerequisite:* ANTH 1100. (Normally offered every third semester)

4220. Human Variation. 3. Studies human biological variation as viewed from the anthropological perspective. Focuses on populational variation among humans in terms of genetic, morphological, and acclimatized characteristics with particular focus on the interaction of biology and culture in shaping these variations. Dual listed with ANTH 5220. *Prerequisite:* ANTH 1100. (Normally offered every third semester)

4230. Forensic Anthropology. 3. Introduces methods and purposes of physical anthropology as applied in human identification for law enforcement agencies. Cross listed with CRMJ 4230. *Prerequisite:* ANTH 1100. (Normally offered fall semester of odd-numbered years)

4240. Forensic Anthropology Laboratory. 2. Studies details of advanced osteometric procedures, particularly as applied to problems of human skeletal identification. Dual listed with ANTH 5240. *Prerequisite:* ANTH 4210. (Offered based on sufficient demand and resources)

4255. Bioarchaeology. 3. Study of the human skeleton in archaeological context to reveal the biological and cultural pasts of individuals and communities. Using case studies, covers the history of the field, ethics of working with human remains, theoretical and methodological approaches to mortuary archaeology. Gain hands-on experience by working with specimens from the UWyoming Human Remains Repository. Dual listed with ANTH 5255. *Prerequisites:* ANTH 1100 or 1300.

4260. Anthropology of Food, Culture, and Nutrition. 3. Offers a biocultural perspective to the study of diet, nutrition, subsistence, and food systems. Study includes basic nutritional principles and diet seen in evolutionary, cross-cultural, ethnographic, and historical perspective; method and theory in nutritional anthropology; and contemporary issues in nutrition, cuisine, and foodways. Dual Listed with ANTH 5260. *Prerequisites:* ANTH 1100 or 1200.

4300. Anthropology of Religion. 3. Provides a comparative anthropological study of religious systems, emphasizing analysis of symbolism, myth and ritual. *Prerequisite:* ANTH 1200. (Normally offered every third semester)

4310. Environmental Anthropology. 3. Addresses how human societies interact with their surroundings, emphasizing cultural understandings of the environment. Introduces variety of theoretical and methodological approaches to topics ranging from problems of the American West to global environmental change. Cross listed with ENR 4310. Dual listed with ANTH 5310. *Prerequisite:* ANTH 1200. (Normally offered every third semester)

4320. Political Anthropology. 3. Encompasses theories and descriptions of relationships between power and society in both less formal tribal contexts and more highly structured political institutions. Dual listed with ANTH 5320. *Prerequisite:* ANTH 1200. (Normally offered every third semester)

4325. Symbolic Anthropology. 3. Teaches several anthropological approaches to symbolic and cultural analysis, while reading ethnographic examples of how symbolic analysis can be used to understand different cultures. Coursework assumes a basic knowledge of social science concepts. *Prerequisite:* ANTH 1200 or SOC 1000.

4330. Social Organization. 3. Provides theories of social organization, interrelations of social institutions, and current anthropological methods of interpretation. *Prerequisite:* ANTH 1200. (Normally offered every third semester)

4340. Culture Change. 3. Examines representative theories of change, factors involved, dynamics of modernization and applied anthropology. Dual listed with ANTH 5340. *Prerequisite:* ANTH 1200. (Normally offered every third semester)

4350. Medical Anthropology. 3. Understandings of health and illness vary widely. Taking a comparative historical approach, examines how an individual's interactions with socio-cultural and physical environments influence the experiences of health and illness. Topics include symbolic healing, biomedicine as a cultural system, disease and international development, global politics of AIDS and other pandemics. Dual listed with ANTH 5350. *Prerequisite:* ANTH 1200 or SOC 1000.

4380. Visual Anthropology. 3. Offers anthropological interpretation of visual representations and media, including analysis of the development of ethnographic films and their contemporary use. Visual representations of many cultures as well as mainstream United States examples are analyzed. *Prerequisite:* ANTH 1200.

4740. Native American Languages and Cultures. 3. Demonstrates the interrelationship of language and culture in several Native American communities. Examines anthropological and linguistic theories regarding

language spread and the peopling of North America, narrative performance, translation, and the connection between linguistic structures and cultural features. Dual listed with ANTH 5740; cross listed with NAIS 4740. *Prerequisite:* ANTH 2000 or consent of instructor.

4765. Language Humor and Games. 3. This course examines various forms of language play and the role of language characteristics (ambiguity, phonology, homophony, etc.) in creating humorous utterances and texts. Anthropological understandings of humor and its use also will be explored. Students will construct and analyze forms of humor throughout the course. Dual listed with ANTH 5765. *Prerequisite:* ANTH 2000 or consent of the instructor.

4775. Language and Gender. 3. Investigates the relationship between language use, linguistic categories, and gender categories. Examines the linguistic practices involved in the formulation, discussion, and performance of gender categories in a number of different cultures. Dual listed with ANTH 5775. *Prerequisite:* ANTH 1200, 2000.

4785. Language and Racism. 3. Explores the ways in which racist ideology and socially-based racial categories are reinforced and changed through language and linguistic usage. The forms of language used in the construction of covertly and overtly racist communication, and the media through which racism is communicated also will be investigated. Dual listed with ANTH 5785. *Prerequisite:* ANTH 1200 or 2000.

4795. Language Change. 3. Considers how languages change over time, due to both internal and external forces. The effects of language contact, borrowing, and structural change are discussed. The use of linguistic data for questions of migration and cultural contact are also explored. Dual listed with ANTH 5795. *Prerequisite:* ANTH 2000.

4970. Internship 1-12 (Max. 12). Allows students to gain hands-on experience, bridging the gap between anthropology as an academic discipline and anthropology as practiced in museums, public archaeology agencies, non-governmental organizations, and private consulting companies. Involves a required academic component in addition to work experience. Internship credit cannot fulfill requirements of the major. *Prerequisites:* anthropology major of junior/senior standing and consent of internship director and/or department head.

4975. Undergraduate Practicum in Anthropology. 1-4 (Max. 6). Affords students the opportunity to extend research projects in field or lab locations and receive additional

credit for their work. Students sign up for these hours only in conjunction with another course and with the instructor's consent. *Prerequisite:* 9 hours in anthropology, consent of instructor.

5000. Special Problems. 1-4 (Max. 12). Conference course to allow graduate students opportunity for both guided and independent research. *Prerequisite:* graduate standing and consent of instructor.

5005. Graduate Seminar in Anthropology. 3 (Max. 6). *Prerequisite:* graduate standing or consent of instructor.

5010. 20th Century Anthropology Theory. 3. Examines major thinkers and schools of thought in anthropology of the 20th century. Emphasis is on cultural theory within the context of the four-field approach. *Prerequisite:* graduate standing in anthropology.

5015. Archaeological Theory and Method. 3. Introduces the students to past and present archaeological theories through a literature survey of most significant topics. Addresses questions, such as: How do archaeologists go about identifying and solving problems? What do they perceive to be problems? What is the logic of archaeological arguments? Dual listed with ANTH 4015. *Prerequisite:* ANTH 1200, 1300, 3310, and at least one 4000 regional course.

5020. Biological Anthropology. 3. Offers a graduate level overview of biological anthropology. Beginning with the history of relevant areas of human biology, provides extensive discussion of such areas as paleoanthropology, primatology, and human variation. Also includes detailed theoretical examinations of topics within hominid evolution, the concept of race and sociobiology. *Prerequisite:* first year anthropology graduate student standing.

5030. Linguistic Anthropology. 3. Demonstrates interrelationships between language, human biology, and culture. In particular, the relevance of the study of language to biological anthropology, archaeology, and cultural anthropology is emphasized. Examines classic approaches in anthropological linguistics and recent controversies such as the origin of language in human evolution.

5110. Zooarchaeology I. 3. An introductory level seminar in the archaeological analysis of faunal materials. Emphasis is on the identification and curation of bones from archaeological and Late Pleistocene paleontological contexts, including their use in the interpretation of prehistoric and historic human behavior, the investigation of paleoenvironmental conditions and paleoecological relationships and problem-oriented taphonomic research. Dual listed with ANTH 4110. *Prerequisite:* ANTH 1300.

5115. Lithic Analysis. 3. An overview of the analysis of stone tools and waste flakes from archaeological sites. Emphasizes appropriate use of typology and methods of debitage analysis. Dual listed with ANTH 4115. *Prerequisite:* ANTH 1300 and 9 additional hours in anthropology.

5120. North American Archaeology. 3. Studies North American prehistory from the earliest evidence to historical times. Dual listed with ANTH 4120. *Prerequisite:* ANTH 1300 or consent of instructor.

5125. Northwestern Plains Prehistory. 3. Covers the Northwestern Plains from the Paleo-Indian to historic contact, including relationships to surrounding areas. Dual listed with ANTH 4125. *Prerequisite:* ANTH 1300.

5130. Old World Archaeology. 3. Survey of the major archaeological sequences of the Old World. Dual listed with ANTH 4130. *Prerequisite:* ANTH 1300.

5135. Quantitative Methods in Anthropology. 3. A consideration of the use of quantitative methods in anthropological research, including descriptive and inferential statistics, pattern search, mathematical modeling and computer simulation. Dual listed with ANTH 4135. *Prerequisite:* STAT 2070 or comparable course.

5145. Origins of the State. 3. This course takes a comparative approach to the study of the origins of the archaic states. Focus is given to themes in complexity such as emergence of social economic inequality, private property, power, ideology, and urbanism. Comparative civilizations/regions include China, Mesopotamia, Egypt, Central Mexico, and Peru. Dual listed with ANTH 4145. *Prerequisite:* ANTH 1300.

5150. Seminar in Prehistory. 1-3 (Max 9). Covers the prehistory of a specified region or time period within that region. emphasizes learning prehistoric sequences, material culture, and research questions associated with the topic. Topics include, but are not limited to, Paleoindian, Archaic, Siberian, Northern Plains, Great Basin, Rocky Mountain, or Southwestern Archaeology. Dual listed with ANTH 4150. *Prerequisite:* ANTH 1300.

5155. Computer Programming for Archaeologists. 3. Introduces the application of computer programming to the collection, management, and analysis (hypothesis testing) of archaeological data. Develop models and simulations of complex prehistoric systems. Begins with an introduction to Microsoft Excel (Visual Basic for Applications), programming structure, and applications to archaeology. Specific assignments in writing programs rel-

evant to typical archaeological problems. Dual listed with ANTH 4155. *Prerequisites:* ANTH 1300 or consent of instructor.

5160. GIS in Anthropology. 4. Introduction to how and why geographic information systems (GIS) are used in anthropology. Considers: 1) Background, definitions, and concepts of geographic data and GIS; 2) Anthropological and archaeological approaches to GIS; and 3) Hands-on experience with GIS applications in archaeology through demonstrations, lectures, and structured inquires. Dual listed with ANTH 4160. *Prerequisite:* ANTH 1200 or 1300.

5165. Advanced Archaeological Research. 3-6 (Max. 6). Intended for graduate students in archeology which will cover a wide range of topics in advanced research techniques. *Prerequisite:* graduate standing.

5170. Geoarchaeology. 3. Introduces students to theory and method in geoarchaeological research. Emphasis is placed upon geomorphological processes of archaeological site formation and paleoenvironmental reconstruction. Dual listed with ANTH 4170. *Prerequisite:* ANTH 1300 or consent of instructor.

5175. South American Prehistory. 3. Intensive study of the archaeology of South America covering its entire prehistory from first peopling at perhaps 14,000 years ago, to the colonial period. The course focuses not only on the well known Andean cultures, but also on the archaeology of the entire continent. Dual listed with ANTH 4175. *Prerequisite:* ANTH 1300.

5180. Advanced Archaeological Field Studies. 6. Covers the entire archaeological process from project planning and budgeting to professional presentation of the results with an emphasis on field methods. Up to date field techniques with electronic data collection and analysis are introduced. Interdisciplinary philosophy is emphasized with lectures, demonstrations and hand-on experience. *Prerequisite:* graduate level students or upper level undergraduates with field school experience and consent of instructor.

5190. Public Archaeology. 3. A consideration of archaeological legislation, policies, and regulations; compliance, heritage, and avocational archaeology; cultural resource management; curation; and professional archaeological ethics. Dual listed with ANTH 4190. *Prerequisites:* ANTH 1300.

5210. Human Osteology. 3. Provides a detailed study of the human skeleton. Dual listed with ANTH 4210. *Prerequisite:* ANTH 1100, LIFE 2022. (Normally offered spring semester)

5215 [5200]. Hominin Evolution. 3. Surveys hominin fossil record in context of evolutionary process, stressing structure-function and

the dynamics of adaptive responses. Dual listed with ANTH 4215. *Prerequisite:* ANTH 1100. (Normally offered every third semester)

5220. Human Variation. 3. Studies human biological variation as viewed from the anthropological perspective. Focuses on populational variation among humans in terms of genetic, morphological, and acclimatized characteristics with particular focus on the interaction of biology and culture in shaping these variations. Dual listed with ANTH 4220. *Prerequisite:* ANTH 1100.

5240. Forensic Anthropology Laboratory. 2. Studies details of advanced osteometric procedures, particularly as applied to problems of human skeletal identification. Dual listed with ANTH 4240. *Prerequisite:* ANTH 4210.

5255. Bioarchaeology. 3. Study of the human skeleton in archaeological context to reveal the biological and cultural pasts of individuals and communities. Using case studies, covers the history of the field, ethics of working with human remains, theoretical and methodological approaches to mortuary archaeology. Gain hands-on experience by working with specimens from the UWyoming Human Remains Repository. Dual listed with ANTH 4255. *Prerequisites:* ANTH 1100 or 1300.

5260. Anthropology of Food, Culture, and Nutrition. 3. Offers a biocultural perspective to the study of diet, nutrition, subsistence, and food systems. Study includes basic nutritional principles and diet seen in evolutionary, cross-cultural, ethnographic, and historical perspective; method and theory in nutritional anthropology; and contemporary issues in nutrition, cuisine, and foodways. Dual Listed with ANTH 4260. *Prerequisites:* ANTH 1100 or 1200.

5310. Environmental Anthropology. 3. Addresses how human societies interact with their surroundings, emphasizing cultural understandings of the environment. Introduces variety of theoretical and methodological approaches to topics ranging from problems of the American West to global environmental change. Cross listed with ENR 5310. Dual listed with ANTH 4310. *Prerequisite:* ANTH 1200.

5320. Political Anthropology. 3. Encompasses theories and descriptions of relationships between power and society in both less formal tribal contexts and more highly structured political institutions.

5340. Culture Change. 3. Examines representative theories of change, factors involved, dynamics of modernization and applied anthropology. Dual listed with ANTH 4340. *Prerequisite:* ANTH 1200.

5350. Medical Anthropology. 3. Understandings of health and illness vary widely. Taking a comparative historical approach, this class examines how an individual's interactions with sociocultural and physical environments influence the experiences of health and illness. Topics include symbolic healing, biomedicine as a cultural system, disease and international development, and the global politics of AIDS and other pandemics. Dual listed with ANTH 4350. *Prerequisites:* ANTH 1200 or SOC 1000.

5730. Field Techniques. 3. Students work directly with the speaker of an unwritten non-Indo-European language to learn techniques for eliciting the data requisite to begin a description of the language's structure. Identical to LANG 5310. *Prerequisite:* ANTH 5100 or LANG 5300.

5740. Native American Languages and Cultures. 3. Demonstrates the interrelationship of language and culture in several Native American communities. Examines anthropological and linguistic theories regarding language spread and the peopling of North America, narrative performance, translation, and the connection between linguistic structures and cultural features. Dual listed with ANTH 4740; cross listed with NAIS 4740. *Prerequisite:* ANTH 5030 or consent of instructor.

5765. Language Humor and Games. 3. This course examines various forms of language play and the role of language characteristics (ambiguity, phonology, homophony, etc.) in creating humorous utterances and texts. Anthropological understandings of humor and its use also will be explored. Students will construct and analyze forms of humor throughout the course. Dual listed with ANTH 4765. *Prerequisite:* ANTH 5030 or consent of instructor.

5775. Language and Gender. 3. Investigates the relationship between language use, linguistic categories, and gender categories. Examines the linguistic practices involved in the formulation, discussion, and performance of gender categories in a number of different cultures. Dual listed with ANTH 4775. *Prerequisite:* ANTH 5010, 5030, or consent of instructor.

5785. Language and Racism. 3. Explores the ways in which racist ideology and socially-based racial categories are reinforced and changed through language and linguistic usage. The forms of language used in the construction of covertly and overtly racist communication, and the media through which racism is communicated also will be investigated. Dual listed with ANTH 4785. *Prerequisite:* ANTH 5030 or consent of the instructor.

5795. Language Change. 3. Considers how languages change over time, due to both internal and external forces. The effects of language

contact, borrowing, and structural change will be discussed. The use of linguistic data for questions of migration and cultural contact also will be explored. Dual listed with ANTH 4795. *Prerequisites:* ANTH 5030 or consent of instructor.

5875. Graduate Practicum. 1-4 (Max. 6). Affords graduate students the opportunity to extend research projects in field or lab locations and receive additional credit for their work. Students sign up for these hours only in conjunction with another course and with the instructor's consent. *Prerequisite:* graduate standing and consent of instructor.

5880. Professionalism. 3. Provides an opportunity for the integration of graduate training and career choice. Examines issues of professionalism in the discipline ranging from ethical conduct to the research process and publication. *Prerequisite:* admission to the doctoral program in anthropology.

5890. Teaching Anthropology. 3. Anthropology is increasingly relevant to many audiences. Provides practical insight and examination of controversial anthropological concepts – race, evolution, culture, etc., and how these may be taught to college or public audience. Also examines the teaching culture of anthropology as a discipline. *Prerequisite:* admission to the doctoral program in anthropology.

5900. Practicum in College Teaching. 1-3. (Max 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: Credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrolled in a graduate degree program.

5980. Dissertation Research. 1-12 (Max. 48). Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrolled in a graduate level degree program.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

Visual and Literary Arts

Art and Art History

110 Visual Arts Building, (307) 766-3269

Web site: www.uwyo.edu/art

Department Head: Ricki Klages

Professors:

ASHLEY HOPE CARLISLE, B.F.A. University of Southern Mississippi 1997; M.F.A. University of Georgia 2002; Professor of Art 2019, 2003.

LEAH HARDY, B.F.A. Kansas University 1987; M.F.A. Indiana University 1990; Professor of Art 2014, 2002.

MARGARET HAYDON, B.A. Oberlin College 1977; M.F.A. San Francisco State University 1989; Professor of Art 2015, 2002.

RICKI KLAGES, B.F.A. University of Arizona 1984; M.A. University of New Mexico 1991; M.F.A. 1993; Professor of Art 2012, 1996.

MARK RITCHIE, B.F.A. University of Kansas 1986; M.F.A. Indiana University 1990; Professor of Art 2007, 1995.

DOUG RUSSELL, B.F.A. Columbia College 1990; M.A. University of Iowa 1995; M.F.A. 1996; Professor of Art 2019, 2005.

Associate Professors:

DIANA BAUMBACH, B.F.A. Washington University in St. Louis 2003; M.F.A. Southern Illinois University 2007; Associate Professor of Art 2015, 2009.

PETER FINE, B.A. California State University, Chico 1993; M.F.A. University of Arizona 2004; Associate Professor of Art 2017, 2013.

RACHEL SAILOR, B.A. Oregon State University 1992; M.A. University of Oregon 1994; Ph.D. University of Iowa 2007; Associate Professor of Art 2015, 2011.

SHELBY SHADWELL, B.F.A. Washington University in St. Louis 2003; M.F.A. Southern Illinois University 2007; Associate Professor of Art 2015, 2009.

Assistant Professors:

BRANDON GELLIS, B.A. University of California at Santa Cruz 2002; M.F.A. University of Denver 2015; Assistant Professor of Art 2015.

KATHLEEN FRYE, B.F.A. University of Colorado at Denver 1987; M.F.A. Colorado State University 1995; M.A. City College, New York; Assistant Professor of Art 2018.

Senior Lecturer:

PATRICK KIKUT, B.F.A. University of Colorado 1990; M.F.A. University of Montana 1994; Senior Lecturer 2019, 2014.

Associate Academic Professional Lecturer:

BAILEY RUSSELL, B.A. Princeton University 2001; M.A. New York University 2004.

Associate Academic Professional

Research Scientist:

DAVID L. JONES Jr., B.F.A. University of Georgia 2000; M.F.A. University of Tennessee 2004.

Assistant Academic Professional Lecturer:

RANI ROBISON, B.A. University of Utah 1999; M.F.A. University of Oregon 2008.

Professors Emeriti: Deaderick, Edwards, Evans, Flach, Forrest, Reif, Russin (Distinguished Professor of Art), Schaefer

The Art and Art History Program within the Department of Visual and Literary Arts supports the creative, aesthetic and cultural development of students within the university community and serves the cultural and educational needs of the state. The department is dedicated to preparing its graduates to assume leadership positions in their professional lives while maintaining an inner commitment to the aesthetic standards of their chosen discipline.

The program fosters a unique combination of innovation, tradition, aestheticism and practicality, by providing a professional visual arts education built on a strong University Studies Program (USP) foundation.

Department Policy

A class within the Art and Art History Program within the Department of Visual and Literary Arts may require additional meeting times, so that students may fully participate in the Visiting Artist Program and the UWAM lecture series.

As a matter of policy, the Department of Visual and Literary Arts reserves the right to retain any works created by students it deems worthy for the purposes of exhibition until the end of the academic year.

The Department of Visual and Literary Arts studios are the primary instructional classrooms. As a matter of policy, access to the studios and use of the equipment is reserved for students who are formally registered for scheduled courses and are following a prescribed curriculum.

Scholarships

The department has several scholarships for qualified students at all stages in the program. See the Department of Visual and Literary Arts website for a full list of scholarships.

Academic and Career Advisement

Faculty advisers work closely with department students to guide and direct their progress through their declared degree program and course of study. Through the visiting Artist Program, the UW Art Museum and internship

placements, the department provides numerous opportunities and role models for a professional life in the visual arts. Through consultation and discussion with faculty advisers, art students consider their interests and abilities in relation to the many and varied careers in the arts and art related fields. Many graduates go directly into industry, on to pursue graduate studies or take the next step in their career plan. On a competitive basis upon graduation, majors may participate in the Post Undergraduate Assistantship Program where they may prepare a portfolio for graduate school and/or gain additional experience in the studio and the classroom setting.

Undergraduate Majors

The University of Wyoming Department of Visual and Literary Arts offers five degrees within the Art and Art History Program:

- Bachelor of Arts in Studio Art
- Bachelor of Fine Arts in Studio Art
- Bachelor of Arts in Art History
- Bachelor of Arts with a Concentration in Graphic Design
- Bachelor of Arts in Art Education

Transfer Residency

A minimum of 26 hours of upper-division course work in the major is required to establish residency in the department for all transfer students. This applies to students in all five of the B.F.A., B.A., and Art Education degree programs who transfer in 12 or more hours of art courses for the major. Students in all art programs must meet the university requirement of at least 42 hours of course work at the upper-division level (3000- and above).

Studio Art and Art Education Majors – General Requirements

ART 1005, 1110, 1120 and 1130 are considered an important preparation and prerequisite for drawing, painting, printmaking, ceramics, sculpture and graphic design courses and are required freshman courses for the major. Studio Art and Art Education Majors must complete the Foundation Core Hours before electing upper division courses in any studio area. ART 2010, 2020, and 2305 are required sophomore courses.

Once sophomore Art Studio and Art Education majors complete course prerequisites, they select a minimum of four courses from the studio core hours. Most of the university and college requirements should be completed as early as possible before the senior year. The department will enforce published prerequisites for courses.

Studio Art and Art Education majors must submit a portfolio for evaluation before proceeding to intermediate and advanced studios beyond the required studio core. Any student whose

portfolio is assessed as deficient must address the deficiencies before receiving permission to advance in the major.

Please note: Studio Art and Art Education students who do not pass the portfolio review will be able to resubmit the following semester. However, if students fail more than once, they will be unable to progress in the Department of Visual and Literary Arts and may be asked to transfer to another department or UW college or complete an art minor. Portfolio evaluation will occur once in each of the fall, spring, and summer semesters.

Art and Art History Program Degrees

B.A. in Studio Art Degree. The B.A. in Studio Art degree is available to students who are preparing for further studies or careers in the arts and arts-related fields, such as art education, graphic design, art therapy, illustration, botanical illustration and forensic illustration. Students work with their academic advisers to select courses from the USP and elective offerings to complement art studies in their areas of interest. Students must earn a grade of C or better in all courses taken to satisfy department requirements. Courses in the major must be taken for a letter grade. In addition to the university requirement that degree candidates hold a minimum cumulative grade point average of 2.000, degree candidates for the B.A. in Studio Art degree in the Department of Visual and Literary Arts also must have a minimum 2.500 overall cumulative grade point average and a 2.500 grade point average within all major courses at the time of graduation.

Transfer Residency. A minimum of 26 hours of upper-division course work in the major is required to establish residency in the department for all transfer students. This applies to students in the B.F.A., B.A., and Art Education degree programs who transfer in 12 or more hours of art courses for the major. Students in all art programs must meet the university requirement of at least 42 hours of course work at the upper-division level (3000 and above).

Based on their goals and career plans, students in consultation with a faculty adviser select the appropriate degree plan. Students major in studio art with areas of study in one or more of the following:

- Drawing
- Painting
- Photography
- Printmaking
- Ceramics
- Sculpture
- Metalsmithing
- Graphic Design

Minimum Course Requirements for B.A. in Studio Art

Foundation Core	15 Hrs.
ART 1005 Drawing I	3
ART 1110 Foundation: Two Dimensional	3

ART 1120 Foundation:	
Three Dimensional	3
ART 1130 Foundation: Color Theory.....	3
ART 2000 Portfolio Review.....	1
ART 2305 Metal/Plaster.....	1
ART 1115 Digital Media.....	1

Studio Core **12 Hrs.**

12 credits chosen from the below. At least one core course must be from 2D and one from 3D.

ART 2005 Drawing II	3
ART 2210 Painting I.....	3
ART 2112 Graphic Design I.....	3
ART 2255 or 2265 Photo.....	3
ART 3510 Printmaking I.....	3
ART 2310 Sculptural Practices I.....	3
ART 2350 Metalsmithing I.....	3
ART 2410 or 2420 Ceramics I or II	3

Upper Division Studio Electives **12 Hrs.**

12 credits of any upper division studio art classes

Art History Core **6 Hrs.**

ART 2010 Survey I.....	3
ART 2020 Survey II.....	3

Art History Electives **6 Hrs.**

6 credits beyond ART 2010 and ART 2020, with at least 3 units at upper division level

Foreign Language **8 Hrs.**

Language 1010	4
Language 1020	4

University Studies Program (USP)

Freshman Seminar	3
Com I	3
Com II	3
Com III	3
Human Culture	6
WYO History and Constitutions.....	3
Q Math	3
PN	6

USP Upper Division Requirement

42 Overall Upper Division total credits required (3000-4000 level anywhere)

Arts and Sciences Core

60 Outside Major credits required total	
Diversity	3
Global	3

B.A. in Studio Art with Graphic Design Concentration. Graphic designers explore a variety of communication issues that deal with diverse messages and audiences. Students interested in pursuing a career in graphic design and visual communication may declare the B.A. in Studio Art with a Concentration in Graphic Design. Students planning to graduate in four years must begin the sequence in the second semester of the freshman year.

Students must earn a grade of C or better in all courses taken to satisfy department requirements. Courses in the major must be taken for a

letter grade. In addition to the university requirement that degree candidates hold a minimum cumulative grade point average of 2.000, degree candidates for the B.A. in Studio Art degree in the Department of Visual and Literary Arts also must have a minimum 2.500 overall cumulative grade point average and a 2.500 grade point average within all major courses at the time of graduation.

The graphic design/visual communication area provides students with a “human centered” approach to learning that challenges and nurtures them to think conceptually and prepares them to be flexible in an international community that is continually being influenced by new ideas, tools and technology. The visual communications center is a facility for undergraduate research that functions as a classroom, studio and high-end technology space and incorporates industry standard tools for graphic design, computer graphics and digital art exploration.

Minimum Course Requirements for B.A. in Studio Art with Graphic Design Concentration

Foundation Core **15 Hrs.**

ART 1005 Drawing I.....	3
ART 1110 Foundation: Two Dimensional	3
ART 1120 Foundation: Three Dimensional..	3
ART 1130 Foundation: Color Theory.....	3
ART 2000 Portfolio Review.....	1
ART 2305 Metal/Plaster.....	1
ART 1115 Digital Media.....	1

Studio Core **12 Hrs.**

12 credits chosen from the below. At least one course must be from 2D and one from 3D.

ART 2005 Drawing II	3
ART 2210 Painting I.....	3
ART 2112 Graphic Design I.....	3
ART 2255 or 2265 Photo.....	3
ART 3510 Printmaking I.....	3
ART 2310 Sculptural Practices I.....	3
ART 2350 Metalsmithing I.....	3
ART 2410 or 2420 Ceramics I or II	3

Graphic Design Concentration **21 Hrs.**

ART 2112 Graphic Design I.....	3
ART 2122 Computer Graphics I.....	3
ART 2030 History of Graphic Design	3
ART 3120 Graphic Design II.....	3
ART 3150 / or 4060 Computer Graphics II or Computer Graphics III	3
ART 3112 Type, Text, Image & Narrative.....	3
ART 4120 Senior Portfolio.....	3
ART 4425 and/or 4400 Graphics Internship and/or Internship	6*

*ART 4425 - Graphics Internship/ART 4400 - Internship. Each graphic design concentration student is responsible to take at least 6-credit hours of Graphics Internship and/or Internship, and may take up to 9-credit hours maximum.

Upper Division Studio Electives 12 Hrs.
12 credits of any upper division studio art classes

Art or Art History Electives 3 Hrs.
3 credits of any art or art history course at any level

Art History Core 6 Hrs.
ART 2010 Survey I.....3
ART 2020 Survey II.....3

Art History Electives 6 Hrs.
6 credits beyond ART 2010 and ART 2020, with at least 3 units at upper division level

Foreign Language 8 Hrs.
Language 10104
Language 10204

University Studies Program (USP)
Freshman Seminar3
Com I3
Com II3
Com III3
Human Culture6
WYO History and Constitutions.....3
Q Math3
PN6

USP Upper Division Requirement
42 Overall Upper Division total credits required (3000-4000 level anywhere)

Arts and Sciences Core
60 Outside Major credits required total
Diversity3
Global3

B.F.A. in Studio Art Degree. The B.F.A. in Studio Art degree is offered to outstanding students who are prepared for art studies, careers and professional activity beyond the undergraduate level. The B.F.A. degree requires 122 hours of credits with up to seventy-eight (78) semester hours focused in studio and art history course work. All B.F.A. in Studio Art students are required to participate in the B.F.A. exhibition upon graduation.

Application

Formal application is made to the program for acceptance into the B.F.A. in Studio Art degree program. Application must be submitted at least three semesters prior to the applicant's anticipated graduation. Favorable faculty review of the application materials are required before a student is declared a candidate for the B.F.A. in Studio Art degree. Applicants must have achieved the following at the time of application to the B.F.A. in Studio Art:

- C or better in all major classes
- 3.25 GPA or above within major classes
- 3.00 or above overall UW total institutional GPA

Undergraduate majors proceed with meeting the USP requirements for the B.A. in Studio Art and balance with foundation, art history, and stu-

dio core requirements in the major until formally accepted as a B.F.A. in Studio Art candidate. Application does not automatically guarantee acceptance into the B.F.A. in Studio Art program.

Final Year

During their final year and in conjunction with the spring B.F.A. exhibition, students enroll in two sequential capstone courses: BFA Capstone I (fall) and II (spring). The courses outline the deadline and requirements for the B.F.A. exhibition as well as coordinating mentoring of B.F.A. candidates. If faculty deem their work insufficient, they reserve the right to exclude the work from the exhibition and withhold the B.F.A. degree. Students transferring to the Department of Visual and Literary Arts who have completed their foundation core and successfully passed portfolio review are eligible to apply for a B.F.A. in Studio Art after one semester in Art and Art History Program.

Minimum Course Requirements for B.F.A. in Studio Art

Foundation Core 15 Hrs.
ART 1005 Drawing I3
ART 1110 Foundation: Two Dimensional3
ART 1120 Foundation: Three Dimensional..3
ART 1130 Foundation: Color Theory.....3
ART 2000 Portfolio Review.....1
ART 2305 Wood/Art Preparation.....1
ART 1115 Digital Media.....1

Studio Core 12 Hrs.
12 credits chosen from the below. At least one core course must be from 2D and one from 3D.
ART 2005 Drawing II3
ART 2210 Painting I.....3
ART 2112 Graphic Design I.....3
ART 2255 or 2265 Photo3
ART 3510 Printmaking I.....3
ART 2310 Sculptural Practices I.....3
ART 2350 Metalsmithing I.....3
ART 2410 or 2420 Ceramics I or II3

BFA Core 12 Hrs.
ART 4600 Professional Practices and Strategies3
ART 4010 Contemporary Art Theory and Practice3
ART 4800 BFA Capstone I.....3
ART 4810 BFA Capstone II3

Upper Division Studio Electives 21 Hrs.
21 credits of any upper division studio art classes

Art or Art History Electives 3 Hrs.
3 credits of any art or art history course at any level

Art History Core 6 Hrs.
ART 2010 Survey I.....3
ART 2020 Survey II.....3

Upper Division Art History Electives 9 Hrs.
9 credits of any upper art history classes

Foreign Language 8 Hrs.
Language 101044
Language 10204

University Studies Program (USP)
Freshman Seminar3
Com I3
Com II3
Com III3
Human Culture.....6
WYO History and Constitutions.....3
Q Math3
PN6

USP Upper Division Requirement
42 Overall Upper Division total credits required (3000-4000 level anywhere)

Arts and Sciences Core
Diversity3
Global3

Outside Major Requirement
Any level outside of art.....9

B.A. in Art History Degree. The B.A. in Art History major offers students with a course of study that will provide depth and breadth in the history of art. Students will develop a broad understanding of world art, study the art of western and other global cultures in-depth, and explore the historiography and professional practices related to the field. Closely linked to the Museum Studies minor curriculum, the B.A. in Art History has a strong vocational application. This degree provides preparation for entry into graduate school or for students who want to enter the work force after their undergraduate education. Students will have the experience and training to enter into the cultural sector (arts or archival management, non-profit work in the arts and humanities, etc.).

Degree Requirements

- Requirements of the degree include:
- 121 hours, including 51 hours within the major
 - All Art courses must be passed with a letter grade of C or better
 - 2.50 GPA within major required
 - 2.50 or above overall UW total institutional GPA
 - UW Transfer Art Residency Requirement for transfer of 12 or more art credit hours into department: 26 upper division hours of UW Art courses

Minimum Course Requirements for B.A. in Art History

Foundation Core 6 Hrs.
6 credits chosen from the below
ART 1005 Drawing I3

ART 1110 Foundation: Two Dimensional3
 ART 1120 Foundation: Three Dimensional.. 3
 ART 1130 Foundation: Color Theory.....3

Studio Core 3 Hrs.

3 credits chosen from the below.
 ART 2005 Drawing II3
 ART 2210 Painting I.....3
 ART 2112 Graphic Design I.....3
 ART 2255 or 2265 Photo3
 ART 3510 Printmaking I.....3
 ART 2310 Sculptural Practices I.....3
 ART 2350 Metalsmithing I.....3
 ART 2410 or 2420 Ceramics I or II.....3

Art History Core 6 Hrs.

Art 2010 Survey I3
 Art 2020 Survey II3

Art History Core Electives 3 Hrs.

3 units chosen from the below
 ART 2700 Introduction to Museology3
 ART 2030 History of Graphic Design3

Upper Division Art History Electives 18 Hrs.

18 units chose from the below – with the following stipulations:

6-9 hours 3000 or 4000 level Art History Courses*

6-9 hours of ART 4790, Art Seminar – required (fulfills USP COM 3 requirement)

3-9 hours Other Historical Traditions (Examples include but are not limited to: Medieval Islamic, Japanese Art and Culture, Meso-American) – required

*6 hours of upper division art history may be taken in other departments with cross listed courses (that may have pre-requisites other than Art History).

* Cross-listed and applicable courses: Intro to Museology, HIST/ANTH/ART 2700; Victorian Women’s Lives, ART/ENGL/WMST 3710, Gender & Humanities (fulfills the USP COM 2 requirement), ART/ENGL/WMST 4830; History of Women Artists (fulfills the G requirement for the A&S Core), ART/WMST 4780; History of Architecture, ARE 3030; The Harlem Renaissance, AMST 4250; Art and Ecology, AMST/ART 4640; Special Topics in American Studies including travel courses (as appropriate); Special topics in Classical and Modern Languages-including travel courses (as appropriate); History of the Book, HIST 4070, 75, 76, 77

Foreign Language 16 Hrs.

LANG 10104
 LANG 10204
 LANG 20304
 LANG 20404

University Studies Program (USP)

Freshman Seminar3
 Com I3
 Com II3
 Com III3
 Human Culture6
 WYO History and Constitutions.....3

Q Math3
 PN6

USP Upper Division Requirement

42 Overall Upper Division total credits required (3000-4000 level anywhere)

Arts and Sciences Core

60 Outside Major credits required total
 Diversity3
 Global3

B.A. in Art Education Degree. The Art Education degree supports students’ development as reflective, innovative and engaged K-12 art educators. The curriculum encompasses extensive Studio Art competencies as well as studies in Art History and Professional Education. Art Education courses cover a variety of teaching practices and methods of curriculum development that include interdisciplinary, multicultural approaches to teaching and emphasize relevance to the lives of K-12 students and the realities of our contemporary world. In-class learning is augmented with firsthand teaching experiences in local and regional schools and includes teaching people of all ages in community-based arts settings. Upon graduation from our program, students earn Wyoming licensure for teaching K-12 Art.

Application

Students must fulfill the requirements listed in the *Application for the Art Education Program Checklist*:

- Completion of *Portfolio Review* with a C or above
- C or above in all Education Courses
- C or above in all Art Content Courses
- Junior Standing (60+ credits)
- 2.75 or above overall UW total institutional GPA
- Completed background check

Minimum Course Requirements for B.A. in Art Education

Minimum course requirements for Art Education Majors follow the curriculum plan for the B.A. Degree: University and College requirements, Foundations Core, Art History Core, Studio Core and Upper Division Studio Electives. The exception that there is no Foreign Language requirement. Students are required to apply for a Wyoming Substitute Teaching Certificate in the fall of their first semester in the program.

Foundation Core 15 Hrs.

ART 1005 Drawing I3
 ART 1110 Foundation: Two Dimensional3
 ART 1120 Foundation:
 Three Dimensional3
 ART 1130 Foundation: Color Theory.....3
 ART 2000 Portfolio Review1
 ART 2305 Metal/Plaster1
 ART 1115 Digital Media.....1

Studio Core 12 Hrs.

12 credits chosen from the below. At least one core course must be from 2D and one from 3D.
 ART 2005 Drawing II3
 ART 2210 Painting I.....3
 ART 2112 Graphic Design I.....3
 ART 2255 or 2265 Photo3
 ART 3510 Printmaking I.....3
 ART 2310 Sculptural Practices I.....3
 ART 2350 Metalsmithing I.....3
 ART 2410 or 2420 Ceramics I or II3

Upper Division Studio Electives 12 Hrs.

12 credits of any upper division studio art classes

Art History Core 6 Hrs.

ART 2010 Survey I.....3
 ART 2020 Survey II.....3

Art History Electives 6 Hrs.

6 credits beyond ART 2010 and ART 2020, with at least 3 units at upper division level

Professional Education Courses 10 Hrs.

EDST 2450 Foundations of Development...3
 EDST 2480 Diversity and Politics of
 Schools4
 EDEX 2484 Introduction to Special
 Education3

Interrelated Arts 3 Hrs.

Art Education Courses 27 Hrs.

ART 3430 Methods I – Art Education
 Studio3
 ART 3490 Philosophy, Theory, Issues.....3
 ART 3550 Art Education Practicum3
 ART 4440 Methods II – Artistic Growth3
 ART 4460 Curriculum Design.....3
 ART 4810 Residency for Elementary3
 ART 4820 Residency for Secondary3

University Studies Program (USP)

Freshman Seminar3
 Com I3
 Com II3
 Com III3
 Human Culture6
 WYO History and Constitutions.....3
 Q Math3
 PN6

USP Upper Division Requirement

42 Overall Upper Division total credits required (3000-4000 level anywhere)

Arts and Sciences Core

Diversity3
 Global3

Undergraduate Minors

- Minors are offered in the following areas:
- Painting
 - Drawing
 - Metalsmithing

- Sculpture
- Photography
- Printmaking
- Ceramics
- Graphic Design
- Museum Studies
- Art History

Further information may be found on the department's website.

Please note: B.A. in Studio Art, B.F.A. in Studio Art, and B.A. in Art Education degree students cannot have a minor in a specific studio discipline. B.A. in Art History students may have a minor in studio disciplines, and B.A. in Studio Art, B.F.A. in Studio Art, and B.A. in Art Education degree students may have a minor in Art History.

Ceramics Minor 24 Hrs.
Required Courses (9)

ART 1005	3
ART 1120	3
ART 2350 or ART 2310	3

Studio Courses in Ceramics (12)

ART 2410	3
ART 2420	3
ART 3410	3
ART 3420	3

Art History Survey Elective (3)

ART 2010 or ART 2020	3
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Drawing Minor 18 Hrs.
Required Courses (12)

ART 1005	3
ART 1110	3
ART 2005	3
ART 3052	3

Studio Elective Courses in Drawing (3)

Choose 3 credits from below

ART 3005	3
ART 4005	3
ART 4052	3
ART 4975	3

Art History Survey Elective (3)

ART 2010 or ART 2020	3
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Graphic Design Minor 25 Hrs.
Required Courses (19)

ART 1005	3
ART 1110	3
ART 1115	1
ART 2112	3
ART 2122	3
ART 3112	3
ART 2030	3

Studio Art Elective (3)

Choose 3 credits from below

ART 3120	3
ART 3150	3
ART 4060	3
ART 2255	3
ART 2265	3
MKT 3210	3

Art History Survey Elective (3)

ART 2010 or ART 2020	3
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Painting Minor 24 Hrs.

Required Courses (12)

ART 1005	3
ART 1110	3
ART 1130	3
ART 2210	3

Studio Electives Courses in Painting (9)

Choose nine credits from 3000/4000-level painting courses including but not limited to:

ART 3210	3
ART 4210	3
ART 4220	3
ART 3250	3
ART 4250	3
ART 4655	3
ART 3260	3
ART 4260	3

Art History Survey Elective (3)

ART 2010 or ART 2020	3
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Photography Minor 24 Hrs.

Required Courses (15)

ART 1110	3
ART 1130	3
ART 3510 or ART 2112	3
ART 2265	3
ART 2255	3

Studio Elective Courses in Photography (6)

Choose from 3000/4000-level photography courses

Art History Survey Elective (3)

ART 2010 or ART 2020	3
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Metalsmithing Minor 24 Hrs.

Required Courses (15)

ART 1110	3
ART 1130 or ART 1005	3
ART 1120	3
ART 2350	3
ART 3350	3

Studio Courses in Metalsmithing (6)

ART 3120	3
ART 4630	3

Art History Survey Elective (3)

ART 2010 or ART 2020	3
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PRINTMAKING MINOR 24 Hrs.

Required Courses (12)

ART 1005	3
ART 1110 or ART 1130	3
ART 3510	3
A drawing course beyond ART 1005	3

Studio Elective Courses in Printmaking (9)

Choose from 3000/4000-level printmaking courses

Art History Survey Elective (3)

ART 2010 or ART 2020	3
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SCULPTURE MINOR 21 Hrs.

Required Courses (12)

ART 1005	3
ART 1120	3
ART 1130	3

ART 2310	3
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Studio Elective Courses in Sculpture (9)

Choose nine credits from the below

ART 3310	3
ART 3320	3
ART 3330	3
ART 3345	3

Art History Survey Elective (3)

ART 2010 or ART 2020	3
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ART HISTORY MINOR 21 Hrs.

Art History Sequence (6)

ART 2010	3
ART 2020	3

Lower Division Requirement (3)

3 credits from the below

ART 2700 or ART 2030	3
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Other Traditions (3)

3 credits from the below

ART 3720, including but not limited to Art & Architecture of Medieval Islam, Japanese Art History, Meso-American Art History	3
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Art History Electives at the 3000/4000-level (9)

Including additional Other Traditions

MUSEUM STUDIES MINOR 24-33 Hrs.

Museum Studies Core (9)

ART 2700 (3)	3
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Choose 3 credits from below

ENGL 4075, MKT 3210, or FCSC 4117	3
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Internship (3)

Choose 3 credits from below

ART 4400, ANTH 4970, HIST 4400, or corresponding number in student's major department	3
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Methods Core (6)

Choose 6 credits from below

AMST 2400, AMST 4300, AMST 4900, ANTH 3300, ANTH 3310, ANTH 4020, ANTH 4190, ART 4790, ENTO 4684, GEOL 2080, GEOL 4717, GEOL 4113; HIST 2050, HIST 3020, HIST 4030, HIST 4050, HIST 4055	6
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Elective Courses (6)

Choose 6 credits from below

Students will choose course from the elective list in conjunction with their advisor, based on their area(s) of interest. Additional courses listed in the museum studies and methods cores can be chosen as electives. For a list of electives, go to www.uwyo.edu/museumstudies

Cultural Experience (3-12)

Choose one of the following:

Study Abroad/International Field School - students may enroll or participate in an approved study abroad course or program (credit hours vary)

Foreign or Indigenous Language - students may enroll in 12 hours of a foreign

language. 8 of the 12 hours must be in the same language. American Sign Language does not qualify.

Art (ART)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦♦Q]).

1005. Drawing I. 3. [CA♦♦(none)] A foundation level drawing course introducing fundamentals of observation, artistic invention, and basic principles of perspective and composition through problems in still life, landscape, and live model. Lectures, drawing sessions, and critiques develop formal, conceptual, and technical understanding of the drawing process.

1101. First-Year Seminar. 3. [(none)♦♦FYS]

1110. Foundation: Two Dimensional. 3. First in a sequence of three foundation courses that investigate the fundamentals of design. Basic aesthetic/formal concepts and conceptual approaches are covered through a variety of two-dimensional mediums. Structured critiques are employed to provide students the experience of assessing formal, conceptual, and technical aspects of art.

1115. Digital Media. 1. An introductory level course designed to investigate the role of digital media in visual literacy. Students gain practice with basic graphics software, explore using the Internet in informing the development of art work, and discuss how application of these skills are used in classroom, studio, and commercial art fields.

1120. Foundation: Three Dimensional. 3. Second in a sequence of three foundation courses that investigate the fundamentals of design. Basic aesthetic/formal concepts and conceptual approaches are covered through a variety of three-dimensional mediums. Structural form is emphasized in various contextual settings. Structured critiques are employed to provide students in the experience of assessing formal, conceptual, and technical aspects of art.

1130. Foundation: Color Theory. 3. Third in a sequence of three foundation courses that investigate the fundamentals of design. Explores color theories based on the color wheel/light spectrum including hue, value, chroma, and aesthetic color relationships. Optical color, emotional/psychological color, and color symbolism are also covered. Structured critiques are employed to provide students the experience of assessing formal, conceptual, and technical aspects of art.

2000. Portfolio Review. 1. One-semester course in which work is created for a portfolio review at midterm based on the content and principles learned in the foundation core classes. Art majors may only attempt successful completion of this course once. *Prerequisites:* successful completion of ART 1005, 1110, 1120, and 1130, and a UW GPA of 2.500 or above.

2002. Special Topics In: 3 (Max. 6). Permits utilization of unusual faculty expertise and provides highly-specialized and particularly pertinent, timely subject matter. *Prerequisite:* ART 1005; ART 1130; sophomore standing.

2005. Drawing II. 3. An intermediate level drawing course building upon fundamentals of observation, artistic invention, perspective and composition through problems in still life, landscape, explorations in wet and dry media, and color with pastels. Lectures, drawing sessions, and critiques develop formal, conceptual, expressive and technical understanding. *Prerequisite:* ART 1005.

2010. Art History I. 3. [CA♦♦H] First semester of a one-year survey. Studies ancient, medieval, renaissance and modern art with special reference to various social, economic and historic factors which motivated and conditioned the aesthetic forms. Includes ancient, medieval and early renaissance periods. ART 2010 and 2020 are required of all art majors and should be taken in sequence.

2020. Art History II. 3. [CA♦♦H] Second semester of a one-year survey. Studies European/American Art from the Renaissance through Contemporary with special emphasis and historical factors which motivated and conditioned the aesthetic forms. Covers Renaissance, Baroque, Rococo, 18th Century, 19th Century, Early Modernism and Contemporary Art. ART 2010 and 2020 are required of art majors and should be taken in sequence.

2030. History of Graphic Design. 3. History of graphic language and evolution of graphic communication. Includes an extensive examination of the social forces that shaped the design profession and how in turn design has shaped society. The theories that moved designers to act to remake society are also considered.

2112 [2120]. Graphic Design I. 3 (Max. 6). Explores techniques of graphic design preparation from concept through paste-up to the printed page, both on as a field that engages both the verbal and the visual is stressed. Problems include a variety of experimental and practical approaches that engage historical and contemporary formal and conceptual exercises. *Prerequisites:* ART 1110 and ART 1115. (Offered fall semester)

2122 [3110]. Computer Graphics I: Coding. 3 (Max. 9). Explores digital art principles in Web spaces through the understanding and use of design tools and techniques. Creative approaches consist of informed planning, thoughtful conceiving, strategic wireframe development and creative execution. Projects include explorations of HTML, CSS, and Processing, and time-based media and image manipulation. *Prerequisite:* ART 1110 and ART 1115. (Normally offered spring semester)

2210. Painting I. 3. Introduces problems in painting, developing skill, techniques and concepts. *Prerequisite:* ART 1005, 1110, and 1130; ART 1120 may be taken concurrently.

2255. Introduction to Photography, Digital. 3. Fundamentals of Digital and Color photography. Students will learn how to use their digital cam-

eras, how to input images to Photoshop and out put them to prints. The class will begin with an investigation of techniques before moving through a series of assignments designed to develop the understanding of how to compose a body of work around a specific theme or concept. Lectures will work through the concepts and history of color photography and regular critiques will guide students towards creating a final portfolio of images. *Prerequisites:* ART 1110, ART 1130.

2265. Introduction to Photography, Black and White. 3. Fundamentals of Black and White film photography, including use of SLR cameras, how to correctly expose film, process it and create prints in the darkroom. The class will begin with an investigation of techniques before moving through a series of assignments designed to develop the understanding of how to compose a body of work around a specific theme or concept. Lectures will work through the concepts and history of Black and White photography and regular critiques will guide students towards creating a final portfolio of images. *Prerequisites:* ART 1110, ART 1130.

2305. Techniques: Wood/Art Preparation. 1. Art Tech 2305 covers two curricular unites, one in which students are introduced to the processes, equipment, hand tools, materials, and necessary safety procedures related to the art department woodshop. In the other unit in this course, students are taught art preparation techniques which they will encounter both as a student and professional. Offered satisfactory/unsatisfactory only.

2310 [1310]. Sculptural Practices I. 3. This beginning sculptural practices course introduces fundamentals in traditional and contemporary sculpture. Students are asked to explore various mediums, techniques, and equipment including: wood and metal fabrication, casting with plaster, and mixed media and digital technology processes. Assigned projects, extensive sketchbook work, artist research, and critique participation is expected. **2350. Metalsmithing I. 3.** Introduces basic technical approaches to fabricating small scale, non-ferrous metals (silver, copper, brass, nickel) including sawing, soldering, filing, drilling, form raising/pressing, texturing, and finishing processes. Investigation into the rich history of metalsmithing as well as innovative contemporary applications will manifest in both sculptural objects and jewelry. Individual studio projects and critical discussion will address aesthetic, conceptual and technical aspects of metalsmithing. *Prerequisite:* ART 1120.

2410. Ceramics I. 3. Introduces ceramic form through traditional hand processes, simple mold making and slip casting. Includes underglaze decoration, glaze application, image transfer, low and high firing processes. Emphasizes formal and conceptual understanding, the development of a strong foundation in ceramic process and the formation of a personal voice in the medium. **2420. Ceramics II. 3.** Introduces ceramic form through wheel throwing technique. Includes underglaze decoration, glaze application, image

transfer, and high temperature surfaces. Emphasizes formal and conceptual understanding, the development of a strong foundation in ceramic process, and the formation of a personal voice in the medium.

2700. Introduction to Museology. 3. [CH◆(none)] Explores the historical, cultural, and contemporary roles of museums and preservation institutions in society. Introduces students to the museum professions, collection and exhibition installation strategies, and ethical problems of governance and collection. Field trips to regional collections are included. Cross listed with AMST/ANTH/HIST 2700.

3002. Special Topics In.: 3 (Max. 9). Courses of broad general appeal will be offered from time to time under this title. Permits utilization of unusual faculty expertise and provides highly-specialized and particularly pertinent, timely subject matter. See current class schedule for topics. *Prerequisites:* ART 2010, Art History I and ART 2020, Art History II.

3005. Drawing III. 3. An advanced drawing course applying the fundamentals of drawing to creative individual problems in figure, still life, and/or landscape composition. Structured yet open assignments, lectures and critiques develop formal, conceptual, expressive, and technical understanding. Course may be repeated for a maximum of 6 credit hours. *Prerequisite:* ART 2000 and 2005. (Offered spring semester).

3030. History of Architecture. 3. [(none)◆H] A survey of the history of architecture and its allied fields, focusing on the formal, aesthetic, cultural and socio-political dimensions, from prehistory to the present. Cross listed with ARE 3030. *Prerequisite:* WA or COM1.

3052. Life Drawing I. 3. An advanced drawing course working from a life model with an emphasis on composition, monochromatic media, drawing techniques and the skeletal and muscular construction as related to action and proportion in the human figure. Lectures, drawing sessions, and critiques develop formal, conceptual, and technical understanding. *Prerequisite:* ART 2000 and 2005. (Normally offered fall semester)

3112 [2110]. Type: Text, Image and Negative. 3. Examines the experimental use of type, its history, structure and background in reference to visual expression, data visualization, messaging, representative power, and time-based and site specific explorations. Advanced explorations in type as concept and critical expression will explore the fields of graphic design and computer visualization. *Prerequisites:* ART 2000 and ART 2112. (Offered spring semester)

3120. Graphic Design II. 3. Studies advanced graphic design preparation, idea generation, conceptualization, and critical thinking. Sustainable design problems include print and package design and an exploration of historical impact of design for reproduction through analog and digital means. Contemporary socio-cultural issues will

be emphasized along with design as an agent for positive change. *Prerequisite:* ART 2000 and 2112. (Offered fall semester)

3150 [4140]. Computer Graphics II: Video Experiments. 3. Explores digital video, sound and site-specific experiments. Students learn and use experimental digital design tools and techniques to develop site-specific time-based individual and collaborative works. Students also collaborate and install works on campus, town and other venues. Projects include video and sound design and editing, graphic arts, computer graphics and digital art history. *Prerequisites:* ART 2000, and ART 2112 or ART 2122.

3180. Graphic Design III. 3. Studies specialized and advanced graphic design preparation, idea generation, conceptualization, collaboration and critical thinking, from paste-up through production. All work is executed both on and off the computer. Design problems include print and packaging design. History of graphic design and advanced production methods are discussed. *Prerequisites:* ART 2000, ART 2112, and ART 3120.

3210. Painting II. 3 (Max. 6). Investigates various painting techniques to create individual work. Emphasizes contemporary and classical treatment of formal, aesthetic and conceptual creative expression. *Prerequisite:* ART 2000 and 2210.

3250. Watercolor Painting I. 3. Investigates watercolor techniques in the development of creative work. Discussion, application and criticism of contemporary ideas about structure, form and color constitute the main activity. *Prerequisites:* ART 1130, 2000 and ART 2210. (Offered based on sufficient demand and resources)

3260. Illustration I. 3. This is an introductory Illustration course. This primary class objective is to develop conceptual skills through a variety of media traditionally used in fine art illustration and a variety of illustration problems and projects. This class is designed to further your interest in illustration and initiate portfolio development. *Prerequisite:* ART 2000.

3265. Intermediate Photography. 3. Focuses on the production of a fully realized portfolio of images. Students will be guided with a set of conceptual projects towards exploring technical boundaries and potential of photography. Research and readings will lead towards the production of a finished and installed body of work. *Prerequisites:* ART 2255 and ART 2265.

3310. Sculptural Practices: Cast Form I. 3 (Max. 6). This intermediate sculptural practices course explores a wide variety of mold-making and processes including cold-casting (paper/fabric/resin casting) and both non-ferrous (bronze and aluminum) and ferrous metal (cast iron) casting techniques. Assigned projects will allow students to engage in the production of finished cast sculpture. Extensive sketchbook, artist research, and critique participation is required. *Prerequisite:* ART 2310 and 2000. (Offered fall semester)

3320. Sculptural Practices: Mixed Media I. 3 (Max. 6). This intermediate course explores mixed media processes in sculptural practices

including soft sculpture fabrication with fabric and fiber, found object manipulation, and digital processes involving 3D printing and laser routing. Assigned projects will engage students in the production of artwork related to the topic. Extensive sketchbook, artist research, and critique participation is expected. *Prerequisite:* 2310 and 2000. (Normally offered fall semester of every other year)

3330. Sculptural Practices: Assembled Form I. 3 (Max. 6). Investigates constructed and assembled form as an essential means of sculptural expression. Emphasizes wood construction, assembled metals and mixed media. Utilizes general carpentry techniques, a variety of welding methods (oxyacetylene, arc, M.I.G. and T.I.G.) and other means of assembling materials. Includes investigation of concepts in assemblage and exposure to classic and contemporary forms of assembled sculpture. *Prerequisite:* ART 2310 and 2000. (Offered spring semester)

3345. Sculptural Practices: Special Topics. 3 (Max. 9). This course addresses specific areas of contemporary sculptural practices such as: Installation, Video/Sound manipulation, kinetic sculpture, and figure modeling. Assigned projects will engage the students in production of artwork related to the topic. Extensive sketchbook work, artist research, and critique participation is expected. *Prerequisite:* ART 2310 and 2000.

3350. Metalsmithing II. 3. Introduces intermediate approaches to fabricating small scale, non-ferrous metals through hammer-raised forming, lost-wax casting, enameling and hardware fabrication. Historical and innovative contemporary applications are fostered through sculptural objects and jewelry-based pieces. Individual studio projects, critical discussion and presentations address aesthetic, conceptual, and technical aspects of metalsmithing. *Prerequisites:* ART 2000 and 2350.

3410. Ceramics III/I. 3. Studies development of ceramic form through multiple construction methods. Problems are designed to develop fluidity and versatility in the different processes introduced in the beginning class. Glaze exploration and development are introduced. Emphasizes design, conceptual development, and professional practices. *Prerequisite:* completion of Foundation Core, ART 2000, ART 2410, ART 2420 and consent of instructor based on portfolio review. (Offered based on sufficient demand and resources)

3420. Ceramics III/II. 3. A second semester continuation of the development of ceramic form through multiple construction methods. Problems are designed to develop fluidity and versatility in the different processes introduced in the beginning classes. Glaze exploration and development are introduced. Emphasizes design, conceptual development, and professional practices. *Prerequisites:* completion of Foundation Core, ART 2000, 2410, 2420, and consent of instructor based on portfolio review. (Offered based on sufficient demand and resources)

3430. Methods I - Art Education Studio. 3. Students investigate ways to translate art making practices and media into K-12 arts curricula and develop effective approaches to teaching these to the K-12 learner. Students create and teach lesson plans based on what they learn through their explorations; they also create their own artwork inspired by their studio investigations. Restricted to junior class standing. *Prerequisite:* ART 2000.

3490. Philosophy, Theory and Issues. 3. [(none)◀COM3] Students explore the foundational elements involved in the history and philosophies of Art Education and the key issues that shape contemporary approaches to teaching in the field. These investigations are undertaken to support students' developing teaching philosophies and inform the connections between their teaching and creative practices. Restricted to junior class standing. *Prerequisite:* ART 2000.

3500. Book Arts. 3. Introduction to the history of the book as an object and the traditional crafts associated with book construction through the exploration of the book as a vehicle for artistic expression. A basic knowledge of technical processes pertaining to book construction, a general familiarity with the history of the book and a conceptual exploration of image making will be gained through demonstrations, hands-on studio work, slide lectures, visits to the museum and archives and through assigned readings. *Prerequisite:* ART 2000 and completion of WB or junior standing.

3510. Printmaking I. 3. Investigates and experiments with processes and properties of print media, including intaglio, lithography and relief. Explores ideas and works of traditional and contemporary printmaking. *Prerequisite:* ART 1005 and ART 1110 and 1130 or concurrent registration in ART 1130.

3550. Art Education Practicum. 1-3 (Max. 3). Practicums are integral to an art education student's development as a teacher. They offer opportunities for immersion and hands-on teaching experiences in art classrooms guided by experienced teachers in the field and the UW faculty. Students develop skills and teaching strategies that complement classroom learning and strengthen their teaching practices. Satisfactory/Unsatisfactory only. *Prerequisites:* ART 3430 and ART 3490.

3710. Gender: Humanities Focus. 3. [CH◀COM2] Explores how men and women are imaged differently, studying the influence of representation on gender (including representations in literature, film, art, popular culture, and/or performance). Sharpens students' ability to analyze texts and images and investigate those texts' messages about gender, sexuality, ethnicity and class. Cross listed with ENGL/W MST 3710. *Prerequisite:* WMST 1080 or ENGL 1010. (Offered once a year)

3720 [2720] Art and Architecture of Medieval Islam. 3. Studies the art and architecture produced by Islamic societies from the time of the Prophet Mohammed to the time of the Crusades (7th-14th centuries CE), and the geographic scope

surrounds the Mediterranean Sea, including the Near Middle East, northern Africa, and Spain. *Prerequisites:* USP WA and WB courses.

3760. American Art History. 3. Addresses American art within the continental United States from first European encounters with the New World to 1900. Will investigate painting, sculpture, and architecture, but will also include some photography, prints, and the decorative arts. *Prerequisite:* ART 2020.

4000. Post Baccalaureate Seminar. 1. Enhance and formalize the Post Baccalaureate experience while creating a creative community across artistic disciplines. Students will read and respond to relevant text, discuss pedagogical concerns, critique their creative research, and develop a professional dossier in support of their future career goals. *Prerequisites:* Completion of all BA/BFA degree requirements and acceptance into the Department of Art Post Baccalaureate program.

4005. Drawing IV. 3. An advanced drawing course exploring conceptual, expressive, personal and technical limits of process and media. Individually proposed projects lead to a coherent body of work. Open discussion and structured critiques develop personal and technical understanding. Repeatable for a maximum of 9 credit hours. *Prerequisite:* ART 2000 and 3005.

4010 [4610]. Contemporary Art: Theory and Practice. 3 (Max. 6). [(none)◀COM3] Taught from the perspective of a studio artist, this course enables students to situate their art within a theoretical context. Students examine how issues in contemporary art relate to philosophical concerns through reading, discussion, and critique. Emphasis is placed on an interdisciplinary framework through which students can discuss their work. *Prerequisites:* ART 2000, junior standing.

4052. Life Drawing II. 3. An advanced drawing course building upon figure construction fundamentals with heavy emphasis on composition, personal expression, wet and dry media, and color with pastels. Lectures, drawing sessions and critiques develop formal, conceptual, expressive and technical understanding. May be repeated for a maximum 9 credit hours. *Prerequisite:* ART 2000 and 3052 (Normally offered spring semester)

4060. Computer Graphics III: 3D Modeling. Explores digital art in 2.5D and 3D spaces, through the experimental use of digital design tools and techniques developing and building digital structures and forms. Projects include explorations in graphic design, 3D modeling and printing, multi-media manipulation and image manipulation. *Prerequisites:* ART 2000 and ART 2112 or ART 2122.

4110. Computer Graphics II. 3. Advanced work on current computer graphic design software. Presents graphic design problems to augment working knowledge of the programs. Lab/lecture. Second course in a two semester sequence. *Prerequisite:* ART 2000 and 3120. (Normally offered spring semester)

4120. Senior Portfolio. 3 (Max. 6). Specialized research for the advanced graphic design student who will develop a mature voice and sense of design. Problems include print, packaging, and multimedia design, sustainability and design for social good while also incorporating preparation techniques for job applications and professional skills. *Prerequisite:* ART 2000, ART 2112, ART 2122. (Normally offered fall semester)

4210. Painting III. 3 (Max. 6). Students will engage the contemporary and classical treatment of the formal, aesthetic, and conceptual approach to their creative expression. Students work from a proposed course of study and will be self-directed and participate in group presentations and critiques. *Prerequisites:* ART 2000 and ART 3210.

4220 Painting Topics. 6. This is an advanced painting course that will cover specific painting approaches for an entire semester. Examples of topics can include Abstraction and color field, figuration, narrative painting, experimental painting media and surfaces, etc. This course will enable students to experience a more comprehensive and targeted set of painting problems for the semester. Topics will vary based on the instructor. *Prerequisite:* ART 2000, 2210, 3210.

4250. Watercolor Painting II. 3. Advanced investigation of watercolor techniques in the development of creative work. Discussion, application and criticism of contemporary ideas about structure, form and color constitute the main activity. *Prerequisite:* ART 2000 and 3250. (Offered based on sufficient demand and resources)

4260. Illustration II. 3. This is the second level Illustration course for students who have had ART 3350. Students will continue to develop conceptual skill in creating narrative illustrations for a variety of projects. The majority of the semester will be dedicated to developing a single project: Graphic Novelization or book illustrations. Students will be focusing on character development, narrative arc, and compelling imagery using materials appropriate for their project. *Prerequisite:* ART 2000 and ART 3260.

4265. Photography III. 3. An advanced photography class focusing on the production of a fully realized portfolio of images. Students interests will help shape a course dedicated to providing them with additional technical tools (traditional printing techniques, high level photoshop tools) and readings and discussions designed to push them beyond the comfortable boundaries of their photographic world. *Prerequisite:* ART 2000.

4310 [5310]. Sculptural Practices: Cast Form II. 3 (Max. 6). This course is an advanced investigation in mold making, cold casting, and metal casting as an essential means of sculptural expression. Emphasis is placed on personal expression and portfolio building at this level. Extensive sketchbook work, artist research, and critique participation is required. *Prerequisites:* ART 2000, ART 2310, ART 3310, and portfolio review by instructor. (Offered based on sufficient demand and resources)

4330. Sculptural Practices: Assembled Form II. 3 (Max. 6). This course is an advanced investigation in assemblage including wood and metal fabrication as an essential means of sculptural expression. Emphasis is placed on personal expression and portfolio building as this level. Extensive sketchbook work, artis research, and critique participation is expected. *Prerequisites:* ART 2000, ART 2310, ART 3310, and portfolio review by instructor.

4355. Metalsmithing III. 3 (Max. 6). Introduces advanced fabrication and surface techniques which build on skills developed in Metalsmithing I and II. Students propose a body of work for the semester based on individual aesthetic, conceptual and technical interests. Professional practices including resume writing, documenting, presenting and exhibiting artwork are addressed at this advanced level. *Prerequisite:* ART 2000 and 3350.

4360. Metalsmithing: Special Topics. 3 (Max 9). Focuses on a specific technique in the field of Metalsmithing for an in-depth exploration into topics such as lost-wax casting, chasing and repoussé, enameling, etc. Individual projects and critical discussion will address the special topic aesthetically, technically and conceptually. *Prerequisites:* ART 2000 and 2350.

4400. Internship. 1-3 (Max. 9). Allows students to bridge the gap between theoretical problems solved in the classroom and the real work world. Students are placed in a setting where they perform duties similar to a working environment. Specific arrangements are made through the major area adviser. Students are evaluated at mid-term and finals. Minimum of three contact hours of internship per week for a semester equals an hour course credit. *Prerequisite:* ART 2000 and 12 hours in the major area.

4410. Ceramics IV/I. 3. Studies and develops traditional and experimental forms. Applies wide range of three-dimensional decorative and conceptual approaches. Continuation of technical and glaze research and professional practices. Introduces kiln operation. Given studio problems accompany individually directed exploration. *Prerequisite:* ART 2000, 3320, 3410, and consent of instructor based on portfolio review. (Offered based on sufficient demand and resources)

4420. Ceramics IV/II. 3. A second semester continuation of the development of traditional and experimental forms. Applies wide range of three-dimensional formal and conceptual approaches. Continuation of technical and glaze research. Introduces kiln operation. Given studio problems accompany individual directed exploration. *Prerequisites:* ART 2000, 3320, 3410, and consent of instructor based on portfolio review. (Offered based on sufficient demand and resources)

4425. Graphics Internship. 3. This course allows graphic design students to better understand real-world design practices, learn about industry standards, and discuss career opportunities and preparedness. Students will be expected to secure internships and meet with an intern advisor

regularly, to gain a strong understanding of the graphic design industry. *Prerequisites:* ART 2000, ART 2112, and ART 2122.

4440. Methods II - Artistic Growth. 3. Students incorporate their understanding of the stages of artistic development with essential components of curriculum design to create lesson plans that engage the K-12 student in student-directed, holistic learning in the visual arts. Another component of the course is professional practice that includes classroom management and preparing professional portfolios. Restricted to senior class standing. *Prerequisites:* ART 3430 and ART 3490.

4460. Curriculum Design. 3. Students develop a thorough knowledge of all the components of curriculum design in Art Education and will create a unit of instruction that includes a focus on enduring understandings, clarity of learning objective, assessment for the visual arts, instructional strategies, differentiation, and alignment with standards. Restricted to senior class standing. *Prerequisites:* ART 3430 and ART 3490.

4510. Printmaking II. 3 (Max. 6). Continues development of printmaking skills gained in introductory printmaking and focuses in particular on the relationship between process and image. Through demonstrations and studio work, slide lectures, visits to the museum and archives, and readings and discussions, technical processes will be refined, print history will be further explored and image making will continue to be developed. *Prerequisite:* completion of Foundation Core, ART 2000 and 3510.

4520. Advanced Printmaking II : Exhibition and Professional Preparation. 3 (Max. 6). Preparation to continue as exhibiting artists. Students further develop their work as artist-printmakers in preparation for a solo or two-person exhibition at the completion of the semester. Presentation and execution of slides, resume, artist statement, locating opportunities and correspondence will be developed throughout the term. *Prerequisites:* ART 2000, 4510 and portfolio approval from instructor.

4600. Professional Practices and Strategies. 3 (Max. 6). [(none)◀COM3] This course offers information to junior/senior level art majors in regards to: finding jobs in art, finding/applying for exhibition opportunities, applying/finding grant opportunities, furthering education including finding/applying for a Masters in art, and overall life possibilities after the completion of an undergraduate art degree. Writing is expected in the form of cover letters, resumes, artist statements, and project proposals. *Prerequisites:* ART 2000, junior or senior standing.

4620. Problems in Art. 1-3 (Max. 6). Special, current studio problems for advanced students. *Prerequisite:* ART 2000 and 6 hours in art. (Offered based on sufficient demand and resources)

4635. Preparation for International Study in Art. 1. An introductory course to international study in art. Specifically focusing on various issues of culture, language, history, art and archeology the student may encounter while traveling abroad. Also provides time for the coordination of practi-

cal issues of travel, necessary documentation and insurance. Issues specific to the country of travel will also be addressed. *Prerequisites:* 6 hours in Art, WA, junior standing.

4650. International Study of Art. 3. [G◀(none)] Students will respond creatively to the historical, cultural and aesthetic experience in the country of travel and will use journaling, drawing, and collection of visual material to continue a more in-depth response upon return. Course sections will vary regarding structure/context. All sections will include studio and/or art historical curriculum. *Prerequisite:* ART 4635.

4655. Outdoor Studio. 3 (Max. 6). The emphasis in this course will be on the expressive nature of outdoor creative work. Students will need to be responsive to the natural environment through a variety of media, including watercolor, oil sticks, drawing, sculpture, photography, video, etc. This course involves travel and day trips to a variety of sites throughout the county and state. *Prerequisite:* ART 2000.

4670. Completion International Study in Art. 1. A completion course to international study in art. Students will compile and complete their response to their experiences encountered in the culture, language, history, art and archeology while traveling abroad. Concise structured critiques will provide time for discussion and digestion of their individual and shared experiences. When possible an exhibition of creative work will be included as a culmination of the program. *Prerequisite:* ART 4650.

4720. 15th Century Renaissance Art. 3. Explores artistic developments of the 15th century, primarily in Italy, in order to appreciate the relationships between artistic production and innovation and other aspects of the social and cultural environment. *Prerequisite:* ART 2010, 2020. (Normally offered spring semester)

4730. 19th Century European Art. 3. Studies 19th-century European painting, prints, and literature, covering Neoclassicism, Romanticism, Realism, Impressionism, and Post-Impressionism. Artists include Elisabeth Vigee-Lebrun, court portraitist; Mary Cassatt and Edgar Degas, famed Impressionists; Edouard Manet, controversial and troubled; Honore Daumier, jailed for incendiary political cartooning; and the eccentric Paul Gauguin and Vincent Van Gogh. *Prerequisite:* ART 2020. (Normally offered fall semester)

4740. 20th Century European Art. 3. Studies 20th-century European art from 1900 to 1945. Covers the 2-D and 3-D art of Expressionism, Cubism, the Bauhaus, Dada and Surrealism, and other important movements in the first half of the 20th century. *Prerequisites:* ART 2010 and 2020. (Normally offered spring semester)

4770. Contemporary Arts Seminar. 3 (Max. 9). Studies the major movements in the visual arts from 1945 to the present. Investigate major theories, stylistic movements, and key artists since WWII with a special focus on the increasing glo-

balization of art during this era. *Prerequisites:* ART 2010 and 2020. (Normally offered fall semester of every other year)

4780. History of Women Artists. 3. Studies documented influence of women as subjects, makers and receivers of art. Emphasizes careers and works of women over a wide range of times and places and under a variety of social circumstances. Greatly emphasizes developments in the 20th century. Cross listed with WMST 4780. *Prerequisite:* ART 2010 or ART 2020 or 3 hours of WMST courses; and WB. (Normally offered fall semester)

4790. Art Seminar. 1-3 (Max. 9). [(none)◀COM3] Special topic in art history and criticism for advanced students. *Prerequisite:* 6 hours in art history. (Offered based on sufficient demand and resources)

4800. BFA Capstone I. 3. BFA Capstone I course is designed to allow students time to participate in group critiques with their BFA cohort group, to refine their writing and documentation process, to learn from visiting artists and various professors in the art department, and to strengthen their studio practice by creating work for their BFA exhibition. *Prerequisites:* Art 2300 and 6 credits of a studio beyond Art 2300; 3.0 overall gpa; 3.25 gpa in Art/Art History; major acceptance into BFA Program.

4810. BFA Capstone II. 3. BFA Capstone II course is designed to allow students time to participate in group critiques with their BFA cohort group, to refine their writing and documentation process, to learn from visiting artists and various professors in the art department, and to strengthen their studio practice by creating work for their BFA exhibition and defending it once artwork is complete. *Prerequisites:* Art 2300 and completion of Art 4800; 3.0 overall gpa; 3.25 gpa in Art/Art History; major acceptance into BFA Program.

4810. Residency for Elementary. 6. This is an eight-week residency for teaching art full time at the elementary level. Students team-teach with an experienced mentor teacher, taking on considerable responsibility for all aspects of teaching art. Upon successful completion of this course and ART 4820, students are certified in Wyoming to teach K-12 Art. Satisfactory/Unsatisfactory only. *Prerequisites:* ART 4440 and ART 4460.

4820. Residency for Secondary. 6. This is an eight-week residency for teaching art full time at the secondary level. Students team-teach with an experienced mentor teacher, taking on considerable responsibility for all aspects of teaching art. Upon successful completion of this course and ART 4810, students are certified in Wyoming to teach K-12 Art. Satisfactory/Unsatisfactory only. *Prerequisites:* ART 4440 and ART 4460.

4830. Victorian Women's Lives: Their Art, Literature and Culture. [CA◀(none)] Interdisciplinary approach to study of women's issues in art. Uses literary/cultural texts to reinforce/contradict and/or expand/enlarge the art historical basis. Topics include domestic goddess, working women, prostitution, education, marriage and

divorce. Cross listed with ENGL./WMST 4830. *Prerequisite:* Either ART 2020 or WMST/ENGL 1080. (Normally offered every sixth semester)

4975. Independent Study and Research. 1-3 (Max. 6). Research options in all creative areas. Students work independently and provide demonstrated ability and background knowledge to carry out self-directed research or creative activity in the research area. Arrangements regarding curricular obligations and meeting times are made with the instructor in advance. *Prerequisites:* ART 2000 and 12 hours of art in research area and prior consent of instructor.

5430. Lo-Tech Ceramics. 3. Exploration of elementary forming, decorating, firing processes developed by various pottery cultures. Examination of basic geology, clay prospecting, kiln design and construction. Includes historical overview and contemporary survey. *Prerequisite:* 12 hours of humanities/GED/USP.

5650. Art and Ideas. 3. Students in this seminar explore the literatures of art. Each seminar has a reading list and a thematic structure. Major critical papers are written during the course of the seminar. Required for M.A. and M.A.T. program Plan B option. *Prerequisite:* 30 hours in art.

5670. Term Creative Project. 1-5 (Max. 15). For M.F.A. candidates only; professional creative achievement in painting, drawing, printmaking, ceramics, or sculpture, leading to presentation of graduate exhibition. Typically, student will consult a single professor in major area for crediting this course. *Prerequisite:* admission to candidacy for M.F.A. degree and consent of instructor.

5710. Medieval Art. 3. Studies the unique qualities of art of this intriguing era of transition between classical and renaissance times. *Prerequisite:* ART 1010, 2010.

5740. 20th Century European Art. 3. Studies European art from 1900 to present. Dual listed with ART 4740. *Prerequisite:* ART 2010 and 2020, consent of instructor.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrolled in a graduate degree program.

Creative Writing

201 Hoyt Hall, (307) 766-6453

FAX: (307) 766-3189

Web site: www.uwyo.edu/creativewriting/

Program Director: Andrew Fitch

Professors:

ALYSON HAGY, B.A. Williams College 1982; M.F.A. University of Michigan 1985; Professor of Creative Writing 2008, 1996.

HARVEY HIX, B.A. Belmont College 1982; M.A. University of Texas, Austin 1985; Ph.D. 1987; Professor of Philosophy and Creative Writing 2015.

FRIEDA E. KNOBLOCH, B.A. Cornell University 1985; Ph.D. University of Minnesota 1994; Professor of American Studies and Creative Writing 2014, 1997.

JEFFREYA. LOCKWOOD, B.S. New Mexico Institute of Mining and Technology 1982; Ph.D. Louisiana State University 1985; Professor of Philosophy and Creative Writing 2006.

BRAD WATSON, B.A. Mississippi State University 1978; MFA University of Alabama 1985. Professor of Creative Writing 2017, 2005.

Associate Professors:

ANDREW FITCH, B.A. University of Wisconsin, Madison 1997; Ph.D. Graduate Center of the City University of New York 2009; Associate Professor of English and Creative Writing 2015, 2009.

KATE NORTHROP, B.A. University of Pennsylvania 1991; M.F.A. University of Iowa 1995; Associate Professor of Creative Writing 2008.

Senior Lecturer:

APRIL HEANEY, B.A. University of Wyoming 1998; M.A. 2000. Senior Lecturer in English and Creative Writing 2015, 2005.

Associate Lecturers:

PAUL BERGSTRAESSER, B.A. Oberlin College 1989; M.A. Northern Michigan University 2000; Ph.D. University of Illinois, Chicago 2007; Associate Lecturer in English and Creative Writing 2013, 2007.

VAL PEXTON, B.A. Humboldt State University 1986; B.A. University of Wyoming 1998; M.A. 2001; M.F.A. 2008; Associate Lecturer in English and Creative Writing 2013, 2009.

We are writers. Our principles follow from what claims us as writers as we guide our students in the creation of their own work. We offer a commitment to art and to the development of community through art. We offer an immersion in making, a chance to discover, to create serious work without pretense, to collaborate, to shake off assumptions and anxieties.

To be first and foremost concerned with making does not mean we take refuge from the world. It means we begin by supporting the deepest, most intelligent engagement with what matters to us as writers. A critical distance from the literary and academic marketplaces allows us to engage with them in a more thoughtful manner once we have found our authentic calling—that which we are truly compelled to explore. Our values will never map perfectly onto the concerns of institutions, and that is good. We strive to create the finest conditions for the making of art when we remain in an eccentric orbit of our own, one that overlaps with the other orbits, yet remains, as much as possible, guided by our own principles which include:

Making: we require the serious, committed, ongoing process of writing and revision.

Range: we cultivate a diversity of taste, form, genre, experience, and background, as well as an open understanding of what might constitute professional accomplishment.

Flexibility: we invite our writers to pursue their own creative and intellectual goals, to tailor the program in individual ways.

Curiosity: we urge creative and intellectual roaming: cross-genre work, interdisciplinary study, the movement across what are usually understood as boundaries; we encourage students to imagine possibilities beyond what is already imagined for them by the program and the university.

Community: we foster an environment that sustains listening, investment in the work of others, collaboration, rigorous expectation, generosity and, at the same time, respect for solitude.

Integrity: we challenge students to engage in deep investigation, to find their intent as a writer and to commit to it fully.

Undergraduate Minor

Minor in Creative Writing. The creative writing minor consists of six courses (18 hours) in creative writing and literature. Four of these courses will be in creative writing (12 hours) and must adhere to the following sequence: CW 1040 Intro to Creative Writing, two Lower Division Creative Writing courses (at the 2000-level), and an Upper Division course (4050). In addition, two courses will be in literature (6 hours). All courses must be completed with grades of C or better.

This minor is intended to be used with any major and must be designed in conjunction with a creative writing advisor. Each course must be passed with a grade of C or better.

Graduate Study

The Creative Writing Master of Fine Arts offers two areas of concentration: fiction and creative non-fiction.

Program Specific Admission Requirements

In addition to the minimum requirements set forth in this Catalog, the Creative Writing M.F.A. Program requires that students demonstrate by means of an official transcript that they have a solid undergraduate record. The M.F.A. program welcomes degrees in any discipline from four-year colleges or universities. Candidates submit GRE general test scores, three letters of recommendation, a writing sample consisting of no more than 25 pages of prose, a 500-word statement of purpose and a vita. Students should consult the M.F.A. web site or contact the department for specific admission information and deadlines.

Program Specific Graduate Assistantships

We are a fully-funded program, meaning that we accept only as many students as we can support with graduate assistantships. Full assistantships carry an annual stipend and remission of tuition and fees, and require the teaching of one section per semester, or equivalent work assignment. M.F.A. students are expected to teach freshman English.

Each fall, the English department conducts a week-long orientation for new teaching assistants and a subsequent series of colloquia. Each graduate assistant is assigned to an experienced teacher in the English department as a mentor, to be available throughout the semester for consultation on teaching and grading techniques.

Program Specific Degree Requirements

Master of Fine Arts in Creative Writing

M.F.A. students follow the guidelines for a Plan A thesis. Only those courses in which a grade of B or better has been earned may be applied to the graduate program of study. All courses must be taken for a grade unless offered for S/U only. No graduate credit is allowed for grades S and U.

The cumulative GPA must be at least 3.000 to receive a degree. Courses below 4000-level will not count toward the degree nor will they be figured in the GPA, although they will appear on the transcript.

A minimum of four Workshops (CW 5560) and/or Creative Writing Seminars (CW 5540) must be taken. These may be in any combination to reach the four-course total, typically for a total of 12-16 credit hours. We require a cross-genre component in that mix of courses.

Elective courses (typically taken for a total of 18 credit hours)

ENGL 5900, taken in semesters

teaching 1010, 1 credit per semester

ENGL 5010, taken in the first semester teaching 1010, 3-4 credits

(can be waived if a student has taken a comparable graduate-level course in a prior program)

Other electives: free to be

taken in any UW program or department across campus

Thesis Hours (5960): 4 credit hours

Total credit hours must be a minimum of 36.

Creative Writing (CW)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

1040. Intellectual Community: Introduction to Creative Writing. 3. Focus on critical learning skills as they relate to creative writing. Read from a variety of genres, attend literary events on campus, acquire research skills, and produce creative writing. Will produce portfolios of creative work in these areas, along with a self-reflective essay applying the critical skills learned throughout the semester.

1101. First-Year Seminar. 3. [(none)♦FYS] 2050. Introduction to Fiction. 3 (Max. 6). Analyzes forms of fiction and the practice of creative writing at an introductory level. *Prerequisite:* WA/COM1.

2060. Introduction to Nonfiction. 3 (Max. 6). The new nonfiction course will be described according to the emphasis the individual professor chooses to impart. In general, the course will teach students to research, organize, and express themselves in a nonfiction genre, such as essay, memoir, article, biography, autobiography, etc. *Prerequisite:* WA/COM1.

2070. Creative Autobiographical Writing. 3. Students read and explore autobiographical writing in various forms, potentially including: brief bio for publicity and job application purposes, memoir, personal essay, confession and fictional monologue. What you can reveal about yourself, when and how and for whom. *Prerequisite:* completion of WA/COM1.

2080. Introduction to Poetry. 3 (Max 6). Analyzes forms of poetry and practice of creative writing at introductory level. *Prerequisite:* WA/COM1.

2125. Writing in Popular Genres. 3.

[WB♦(none)] Analyze and write in a variety of popular fiction and non-fiction genres. Study publishers' descriptions and read examples and critical analysis of the genres. Finally, produce a rhetorical description and an original text work in one chosen genre. *Prerequisite:* ENGL 1010.

4050. Writer's Workshop. 3 (Max. 6 at undergraduate, Max. 12 for graduate). Students submit manuscripts in the short story, poetry, drama, etc. Includes class and conference criticism and consultation. Considers different types of creative writing in various semesters, as announced in class schedule. *Prerequisites:* 3 hours of a 2000-level creative writing class in the appropriate genre and consent of instructor.

5540. Seminar in Creative Writing. 1-4. Includes form and theory classes, publication workshops, and readings courses. Depending on the particulars, students review important texts about writing, review literary magazines and publishing houses, discuss publishing procedures with faculty and guests, participate in close readings of original texts, and produce an independent writing project. *Prerequisite:* graduate standing or consent of instructor.

5550. Independent Study in Creative Writing. 1-3 (Max. 6). Guided independent writing of poetry or imaginative prose at an advanced level. Limited enrollment. No more than 9 hours of ENGL 4050 and ENGL 5550 combined may be counted toward the M.A. in English. *Prerequisite:* consent of instructor and graduate status or 6 hours of ENGL 4050.

5560. Graduate Writing Workshop. 1-4 (Max. 28). Graduate level workshop that emphasizes reading as well as writing in a specific genre (poetry, nonfiction, fiction) or in relation to a theme that combines genres, at the discretion of the instructor. *Prerequisite:* 12 hours of 4000-level creative writing or graduate status or consent of instructor.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students who coursework is complete and are writing their thesis. Offered Satisfactory/Unsatisfactory only. *Prerequisite:* Enrollment in a graduate degree program.

5990. M.F.A. Internship. 1-12 (Max. 24). Internship. Offered Satisfactory/Unsatisfactory only. *Prerequisite:* Enrollment in a graduate degree program.

Astronomy and Astrophysics

The Bachelor of Science degree in astronomy and astrophysics is administered by the Dept. of Physics and Astronomy faculty. Please see the Physics and Astronomy listing for information.

Biology

Biology Degree

The Bachelor of Science degree in Biology is designed to provide a thorough foundation in biology and other supporting areas of science and mathematics, while providing maximum flexibility and student choice. The degree program is administered by the Department of Botany. Upon completion of the core requirements for the major (see list at www.uwyo.edu/biology), specific courses to complete the major will vary according to a student's interests and career plans and may be selected from a variety of departments on campus in consultation with a student's faculty adviser.

**Department of Botany, 3165
114 Aven Nelson Building, 766-2380
FAX: (307) 766-2851**

Web site: www.uwyo.edu/botany

Freshman and Sophomore Years

Students take introductory courses in biology, chemistry, physics, and mathematics. These courses provide the foundation for more advanced work in upper division biology courses and contribute to a more comprehensive understanding of biological processes.

Junior Year

Students take courses in genetics, ecology, evolution and statistics. Students should consult the biology degree web site for the list of requirements (www.uwyo.edu/biology) and meet with their adviser regularly to assess progress toward meeting all degree requirements.

Senior Year

In consultation with their advisers, students select advanced courses in the biological sciences that they find particularly interesting. Advisers maintain lists of suggested courses that include offerings from a variety of departments at UW.

Undergraduate Minor

A minor in biology is offered. For details, consult the web site www.uwyo.edu/biology.

Teacher Education

Students who plan to teach in secondary schools should consult the College of Education section.

Botany

**114 Aven Nelson Building, (307) 766-2380
FAX: (307) 766-2851**

Web site: www.uwyo.edu/botany

Department Head: Naomi Ward

Professors:

GREGORY K. BROWN, B.S. Colorado State University 1973; M.S. Arizona State University 1978; Ph.D. 1980; Professor of Botany 1997, 1985.

ALEX BUERKLE, B.A. (Hons.) University of Missouri 1990; Ph.D. Indiana University 1997; Professor of Botany 2016, 2004.

BRENT E. EWERS, B.S. Colorado State University 1995; M.S. Duke University 1997; Ph.D. 1999; Professor of Botany 2014, 2002.

STEVEN L. MILLER, B.S. University of Wyoming 1979; M.S. Virginia Polytechnic Institute and State University 1982; Ph.D. 1985; Professor of Botany 2002, 1990.

NAOMI WARD, B.Sc. (Hons.) University of Queensland 1993; Ph.D. University of Warwick 1997; Professor of Molecular Biology and Botany 2019, 2007.

CYNTHIA WEINIG, B.A. (Hons.) Brown University 1991; Ph.D. Indiana University 1999; Professor of Botany and Molecular Biology 2013, 2007.

DAVID WILLIAMS, B.A. The University of Texas, Austin 1985; M.S. Texas A&M University 1988; Ph.D. Washington State University 1992; Professor of Botany 2009, 2003.

Associate Professors:

ELLEN D. CURRANO, B.Sc. (Hons.) University of Chicago 2003; Ph.D. Pennsylvania State University 2008; Associate Professor of Botany 2017, 2014.

DANIEL LAUGHLIN, B.S. Calvin College 1999; M.S. Pennsylvania State University 2002; Ph.D. Northern Arizona University 2009; Associate Professor of Botany 2017.

Assistant Professors:

LAUREN SHOEMAKER, B.A. (Hons.) Colorado College 2011; Ph.D. University of Colorado Boulder 2017; Assistant Professor of Botany 2019.

CATHERINE E. WAGNER, B.A. (Hons.) Whitman College 2004; Ph.D. Cornell University 2011; Assistant Professor of Botany 2015.

CHRISTOPHER WEISS-LEHMAN, B.A. Earlham College 2010; Ph.D. University of Colorado Boulder 2017; Assistant Professor of Botany 2019.

Senior Lecturer:

MARK E. LYFORD, B.A. St. Olaf College 1993; M.S. University of Wyoming 1995; Ph.D. 2001; Senior Lecturer in Botany 2014, 2005;

Assistant Lecturers:

JAMIE CRAIT, B.Sc. Oregon State University 1999; M.S. University of Wyoming 2005; Ph.D. 2013; Assistant Lecturer in Botany 2018.

CHRISTOPHER NORTH, B.S. Virginia Polytechnic Institute and State University 2002; M.S. Eastern Illinois University 2005; Ph.D. University of Wyoming 2017; Assistant Lecturer in Botany 2014.

Senior Research Scientist:

BURRELL E. NELSON, B.A. Andrews University 1971; M.A. University of Wyoming 1974; Senior Research Scientist.

Professors Emeriti:

Dennis H. Knight, Stephen T. Jackson, William A. Reiners

Associate Professor Emeriti:

Daniel B. Tinker

Botany is the study of plants and their relationship to human affairs. The science is fundamental to food, fiber and pharmaceutical production; to the management of landscapes for beauty, recreation, forest products and forage; and to the protection of landscapes against pollution and other abuses. The botanist is concerned with the diversity and classification of plants and fungi, their structure at both the macroscopic and microscopic levels, and their physiology, ecology and genetics and evolutionary relationships.

Courses in botany have been developed to meet the needs of the following groups of students: those who desire a general knowledge of the subject for its cultural value; those specializing in areas which require a background in plant biology; and those selecting botany or biology as a major.

Undergraduate Degrees**Biology**

The Biology major is designed for students interested in obtaining a broad education in biological sciences. It enables students to combine courses in biology, botany, zoology, physiology, and other biological sciences to meet the requirements of the major. On completion of the core requirements for the major, specific courses selected to complete the major may vary according to students' interests and are worked out by consultations between student and adviser. The requirements for a bachelor of science degree in biology are as follows:

FRESHMAN YEAR: Fall	Hrs.
LIFE 1010*	4
First-Year Seminar (FY)*	3
MATH 1400	3
CHEM 1020 or CHEM 1000	4
Total Hrs.	14

FRESHMAN YEAR: Spring **Hrs.**

One of the following:

LIFE 2022, LIFE 2023 or MICR/MOLB 2021	4
ENGL 1010*	3
MATH 1405	3
COSC 1010	3
A&S Core Global	3
Total Hrs.	16

SOPHOMORE YEAR: Fall **Hrs.**

One of the following:

LIFE 2022, LIFE 2023 or MICR/MOLB 2021	4
MATH 2200	4
PHYS 1110	4
Human Culture (H)	3
Total Hrs.	15

SOPHOMORE YEAR: Spring **Hrs.**

LIFE 3050	4
LIFE 2100 or STAT 2050	4
PHYS 1120	4
Human Culture (H)	3
Total Hrs.	15

JUNIOR YEAR: Fall **Hrs.**

CHEM 2300	4
Communication II (COM2)*	3
LIFE 3400	3
US and WY Constitutions (V)	3
Total Hrs.	13

JUNIOR YEAR: Spring **Hrs.**

MOLB 3610	4
A&S Core US Diversity	3
LIFE 3500	3
Upper Division Electives	6
Total Hrs.	16

SENIOR YEAR: Fall **Hrs.**

LIFE 3600	4
BOT 4100* (COM3)	2
BOT 4101* (COM3)	1
Upper Division Electives	8
Total Hrs.	15

SENIOR YEAR: Spring **Hrs.**

Upper Division Electives	16
Total Hrs.	16

*Course must be completed with a grade of C or better.

Botany

Students majoring in botany may pursue a B.S. degree and are required to take the following:

FRESHMAN YEAR: Fall	Hrs.
LIFE 1010	4
First-Year Seminar (FY)*	3
MATH 1400	3
CHEM 1020 or CHEM 1000	4
Total Hrs.	14

FRESHMAN YEAR: Spring **Hrs.**

LIFE 2022	4
ENGL 1010	3
MATH 1405	3
CHEM 1030	4
A&S Core Global	3
Total Hrs.	17

SOPHOMORE YEAR: Fall **Hrs.**

LIFE 2023	4
LIFE 2100 or MATH 2200 or STAT 2050 ..	4
PHYS 1110	4
Human Culture (H)	3
Total Hrs.	15

SOPHOMORE YEAR: Spring **Hrs.**

MICR/MOLB 2021	4
BOT 3000	4
PHYS 1120	4
Human Culture (H)	3
Total Hrs.	15

JUNIOR YEAR: Fall **Hrs.**

BOT 3600	4
CHEM 2300	4
Communication II (COM2)	3
LIFE 3400	3
LIFE 3410	2
Total Hrs.	16

JUNIOR YEAR: Spring **Hrs.**

MOLB 3610	4
A&S Core US Diversity	3
LIFE 3050	4
Elective	3
Total Hrs.	14

SENIOR YEAR: Fall **Hrs.**

BOT 4700	4
BOT 4100* (COM3)	2
BOT 4101* (COM3)	1
Upper Division Elective (BOT)	4
Elective	3
Total Hrs.	14

SENIOR YEAR: Spring **Hrs.**

BOT 4730	4
US and WY Constitutions (V)	3
Upper Division Electives	8
Total Hrs.	15

*Course must be completed with a grade of C or better.

Ecology and Evolution Concentration

The Department of Botany offers the Ecology and Evolution Concentration for Biology majors. This concentration will prepare students for a career or further graduate study. Students will receive the academic training to become park naturalists, environmental consultants, restoration ecologists, natural resource managers, conservation scientists, environmental educators, and research technicians in academic or government agencies. In addition to core concepts and theories, this

concentration will teach students important skills that are required in the workforce, including organism identification, quantitative reasoning, data analysis, and scientific communication. Students also will have opportunities to participate in faculty research projects, which will train them for graduate research, careers in scientific discovery, or any endeavor where critical thinking and problem solving are essential components of the vocation.

To fulfill the requirements of the concentration, students will select five courses that meet a minimum of 15 credit hours in addition to what is required for the Biology Major. These will be selected from a variety of upper-division (3000-4000) courses that satisfy their individual interests (listed below).

Students must select

1. one course in organismal biology (A),
2. one course in ecology (B),
3. one course in evolution (C),
4. any one additional course from these three categories,
5. and one fourth-year capstone course (D).

Students who concentrate in Ecology and Evolution should plan to take Evolutionary Biology (LIFE 3500) in their third year to be able to take an additional evolution course before graduating. All courses listed below will count toward this concentration. However, there are many other excellent courses offered across campus that are relevant to this concentration. Students can obtain approval to take other courses that are not included on the list below to satisfy the requirements of the concentration.

List of potential courses

A. Organismal biology

Plant diversity and systematics (BOT3600; 4 cr)
 Ornithology (ZOO4350; 3 cr)
 Mammalogy (ZOO4370; 3 cr)
 Mushrooms of the Rocky Mountains (BOT4360; 3 cr)
 Microbial diversity and ecology (SOIL4540; 4 cr)
 Invertebrate zoology (ZOO4540; 4 cr)
 Symbiosis (BOT4395; 3 cr)

B. Ecology

Vegetation ecology (BOT4700; 4 cr)
 Behavioral ecology (ZOO4415; 3 cr)
 Tropical field ecology (ZOO4650; 4 cr)
 Paleobotany (BOT/GEOL4280; 4 cr)
 Biogeochemistry (BOT4780; 3 cr)
 Marine biology (BOT4235; 3 cr)
 Plant-microbe interactions (BOT4200; 3 cr)

C. Evolution

Special Topic: Macroevolution (BOT4790; 3 cr)

Special Topic: Evolution of development (BOT4790; 3 cr)

Special Topic: Evolution seminar (BOT4790; 3 cr)

Fundamental concepts in evolution (BOT/ZOO5060; 3 cr)

D. Senior capstone course

Undergraduate research (BOT4965; 3 cr)

Undergraduate Minors

The Department of Botany offers an undergraduate minor in Botany and a minor in Biology.

Requirements for Botany Minor

Required Courses (11-12 credit hours): BOT 3000, and BOT 4640 or BOT 4680, and BOT 4700 or BOT 4775

Elective Courses (minimum 7 credit hours). Choose from the following: BOT 3100, BOT 3150, BOT 4111, BOT 4130, BOT 4330, BOT 4420, BOT 4550, BOT 4730, BOT 4745, BOT 4780

Total credit hours for botany minor: 18

Requirements for Biology Minor

Students who are majoring in Biology may not declare a Minor in Biology. Elective credit hours used towards the BIOL minor must be in courses not being counted towards a student's major. A grade of "C" or better is required in all courses. At least 25% of credit hours for the BIOL minor must be earned in upper division courses.

Required Courses (12 credit hours): LIFE 1010, and select two of the following: LIFE 2021, LIFE 2022, LIFE 2023

Elective Courses (9-12 credit hours): Select one different course from each of three of the following subject areas. One of the three courses must have a laboratory component.

- *Molecular/Genetics/Cell Biology:* LIFE 3050, LIFE 3600, MOLB 3000, ZOO 4425
- *Morphology/Physiology:* BOT 3000, BOT 4395, BOT 4730, ZOO 4190, ZOO 4330, ZOO 4350, ZOO 4370, ZOO 4540, ZOO 4380
- *Evolution:* LIFE 3500, LIFE 3600, BOT 4280
- *Ecology:* LIFE 3400, BOT 4280, BOT 4700, BOT 4730, BOT 4745, BOT 4775, MOLB 4540, ZOO 4415, ZOO 4420, ZOO 4440, ZOO 4400

Credit in other courses with different prefixes in the biological sciences area may be applied to the minor in Biology at the discretion of a student's minor advisor.

Teacher Education

Botany collaborates with the College of Education in offering the Natural Sciences Program, which provides training in science and mathematics for prospective K-12 teachers.

Graduate Study

The Department of Botany offers graduate programs leading to the master of science and the doctor of philosophy degrees in botany and the master of science degree in botany/water resources.

Program Specific Admission Requirements

A minimum GPA of 3.000 on previous coursework is required.

Program Specific Degree Requirements

Regardless of field of specialization, all candidates will be held responsible for basic information in the following areas: genetics, physiology, morphology, and evolutionary and environmental botany. A knowledge of chemistry (including organic and elementary biochemistry), physics, calculus, and statistics may be required.

A minimum GPA of 3.000 must be maintained. Any course in which a C (or below) or U is obtained cannot be counted toward the degree requirement.

Participation in seminars will be required of all candidates during their residence at the University of Wyoming.

Master's Program

Requirements for this degree are 26 semester hours of courses approved by the student's committee plus four hours of BOT 5960, Thesis Research.

Doctoral Program

In addition to the minimum requirements set forth in this Catalog, the Department of Botany may require that a student demonstrate skills in two peripheral areas. This decision is made for individual cases by the major professor and graduate committee. These could include foreign languages, statistics, or computer science. In some cases, additional skills may be required.

Botany (BOT)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1101. First-Year Seminar. 3. [(none)◀▶FYS]

3000. Plant Ecophysiology/Plant Form and Function. 4. Integration of basic vascular plant anatomy, morphology, physiology within the contexts of modern evolutionary and ecological theory. Students receive in depth exposure to fluid flow, energetics, development, growth, general metabolism, and structure, and functions for plant cells, tissue and organs. Cross listed with: REWM 3000. *Prerequisite:* LIFE 2022 or LIFE 2023.

3100. Plants and Civilization. 3. [L↔(none)] Overview of past and current roles plants have in human civilizations and culture. Socio-economic impacts of agriculture, famine, deforestation, wealth allocation, politics and technology will be discussed in relation to specific plants and plant products. Examples include plant fibers, stimulants, drugs and medicinals, foods, spices and other plant-derived resources. *Prerequisite:* COM1 or equivalent writing course.

3600. Plant Diversity and Systematics. 4. A broad introduction to modern vascular plant systematics, with emphasis on identification, classification, nomenclature, speciation, adaptation, convergence, and phylogenetic methods. Lab emphasizes learning major flowering plant families and genera, major invasive species, use of keys and manuals, and plant collection, with a Wyoming and Rocky Mountain focus. *Prerequisite:* LIFE 2023, or equivalent.

4001. Modeling the Earth System. 4. Takes a modeling approach to demonstrate how the Earth is integrated into an interconnected system through exchanges of energy and matter, and how Earth system functioning is susceptible to human alteration. Unifying concepts focus on quantitative interactions between the Earth and the Sun, and between the Earth's lithosphere, hydrosphere, biosphere and atmosphere. Cross listed with ATSC/ESS/GEOL. *Prerequisites:* MATH 2205 or equivalent and [ESS 2000 or GEOL 2000].

4040 [G&R 4040]. Conservation of Natural Resources. 3. [CS↔(none)] Geographically analyzes conservation of natural and human resources, as well as political, social and ethical ramifications of our environmental policy. Cross listed with ENR/GEOG 4040. *Prerequisite:* 6 hours of geography or ENR.

4100. Scientific Communication. 2. [WC,L↔COM3] This course is designed to provide intensive instruction in written, oral, and digital communication for zoology and physiology, biology, and botany majors. The course teaches students to communicate and execute research using practices common in the biological sciences. Cross listed with ZOO 4100. *Prerequisites:* COM1, COM2, and concurrent or prior upper division BOT, ZOO, or LIFE course. Preference given to seniors.

4101. Scientific Communication Lab. 1. This course is designed to provide intensive instruction in written, oral, and digital communication for zoology and physiology, biology, and botany majors. The course teaches students to communicate and execute research using practices common in the biological sciences. Cross listed with ZOO 4101. *Prerequisites:* COM1, COM2, and concurrent or prior upper division BOT, ZOO, or LIFE course. Preference given to seniors.

4200. Plant-Microbe Interactions. 3. This course is designed to improve content knowledge in Microbiology, with a specific focus on plant-microbe interactions and their application to ecology, conservation, agriculture, and rangeland management, and to enhance oral presentation skills. Dual listed with BOT 5200. *Prerequisites:* LIFE 1010 and LIFE 2021.

4235. Marine Biology. 3. This course explore major topics of physical oceanography, marine biodiversity and ecology, and human impacts on the ocean. Emphasis is placed on reading, evaluating, and synthesizing primary literature. Dual listed with BOT 5235. Cross listed with ZOO 4235. *Prerequisite:* LIFE 3400 with a grade of C or better.

4280. Paleobotany. 4. An examination of the ecology and evolution of land plants throughout Earth history that emphasizes the profound impact plants have had on Earth's surface and atmosphere. Through a combination of lecture, discussion, and laboratory, the course will explore fossilized plant communities, their ecological properties, and effects of major environmental upheavals. Dual listed with BOT 5280. Cross listed with GEOL 4280. *Prerequisite:* a grade of C or better in LIFE 1010 or GEOL 1100.

4360. Mushrooms of the Rocky Mountains. 3. A broad introduction to the biology of mushrooms, with emphasis on identification, ecology, and safety for consumption. Lab emphasizes learning major mushroom families and genera and their features, use of keys and manuals, and mushroom collections with a Wyoming and Rocky Mountain focus. *Prerequisites:* LIFE 2023 or equivalent.

4395. Symbiosis. 3. Symbiosis, the living together of unlike organisms, encompasses mutually beneficial to reciprocally detrimental interactions. The course examines conditions required for establishment and maintenance of important symbioses including mycorrhizae, lichens, endophytes, nitrogen-fixing and endosymbiotic bacteria, fungal/insect interactions, and fungal pathogens. Symbioses in forest ecosystems will be emphasized. Dual listed with BOT 5395. *Prerequisites:* LIFE 2022 or LIFE 2023, and LIFE 3400.

4420. Conservation Biology. 3. Addresses the broadest environmental issues facing society (habitat loss, invasion, overexploitation) and the mechanisms driving them, with particular attention to the Intermountain West. Through computer exercises, students also learn how to evaluate conservation efforts and make management recommendations. Cross listed with ENR/ZOO 4420. *Prerequisites:* LIFE 3400 and one of the following: ENR 3500, STAT 2050, or STAT 2070.

4550. Computational Biology. 4. Introduces concepts and skills that are generally applicable to computational analysis of biological questions. Content is motivated by applied projects that require basic computer programming for analysis. Two computer languages are introduced and utilized. Dual listed with BOT 5550. *Prerequisite:* MATH 2200 or STAT 2050 or equivalent; LIFE 1010 or equivalent.

4640. Flora of the Rocky Mountains. 3. Field course. Acquaints students with the flora of the surrounding region. Emphasizes field identification and collection from plant communities encompassing a wide range of environments, such as grasslands, forests and alpine tundra. *Prerequisite:* LIFE 2023. (Normally offered summer session)

4664. Special Topics in Evolution. 1-4 (Max. 6). Advanced topics in evolutionary biology are engaged by studying primary research and topical synthesis in the current literature. Dual listed with BOT 5664. *Prerequisite:* LIFE 3500 or equivalent.

4680. Taxonomy of Vascular Plants. 4. A study of classification principles, nomenclature rules and systematic botany literature. Plants of the Rocky Mountain region are used primarily as examples, but the course gives a comprehensive view of the characteristics and relationships of the principal plants families. *Prerequisite:* LIFE 2023. (Normally offered spring semester)

4700. Vegetation Ecology. 4. Reviews the ecology of major vegetation types, emphasizing patterns of vegetation distribution, vegetation-environment relationships, succession, the effect of fire and management decisions, and methods of vegetation analysis. Dual listed with BOT 5700. *Prerequisite:* LIFE 3400. (Normally offered fall semester)

4730. Plant Physiological Ecology. 4. Acquaints advanced students with environmental factors which affect the establishment and growth of plants. Emphasizes adaptive mechanisms. Dual listed with BOT 5730; cross listed with RNEW 4730. *Prerequisites:* one course in physiology and one course in ecology. (Normally offered spring semester)

- 4745. Terrestrial Ecosystem Ecology. 3.** Advanced course examines fundamental ecosystem functions and their relationship to ecosystem structure using a systems approach. We study cycles of carbon, water and nutrients through ecosystem components with an emphasis on interactions among plants, soil, and the atmosphere. Current readings focus on responses of terrestrial ecosystems to global climate change and human disturbance. Dual listed with BOT 5745; cross listed with ECOL 5745. *Prerequisite:* 1 course in ecology.
- 4775. Forest Ecology. 4.** Integrative study of the structure, function, and ecological diversity of forested ecosystems, and the physical factors that influence this diversity, including emergent properties of energy flow and nutrient cycling. Special emphasis is given to understanding forest disturbances and succession, and implications for impacts of management and sustainability are discussed throughout. Dual listed with BOT 5775; cross listed with RNEW 4775. *Prerequisite:* LIFE 3400. (Normally offered fall semester of odd-numbered years)
- 4780. Biogeochemistry. 3.** A comprehensive treatment of biogeochemistry with emphasis on biogenic elements and biological processes. Reviews occurrence of elements, their behavior in the biosphere, and how their cycles are affected by humans. Dual listed with BOT 5780. Cross listed with ESS 4780. *Prerequisite:* Consent of instructor.
- 4790 [4710]. Special Topics in Ecology. 1-3 (Max. 6).** Acquaints students with various topics not covered in regular courses. Emphasizes recent developments appearing in journal literature. Dual listed with BOT 5790. *Prerequisite:* two courses in ecology.
- 4965. Undergraduate Research in Botany. 1-10 (Max. 10).** Undergraduate research or study in botany done under the guidance of a Botany Faculty Member. Encouraged to present their research at local, regional, or national scientific meetings, and, when appropriate, submit a manuscript for publication. *Prerequisites:* LIFE 2023, undergraduate status in good academic standing; consent of a botany faculty research mentor.
- 4970. Internship. 1-12 (Max. 12).** Provides undergraduate students with academic credit for approved work experiences in the fields of botany and biology. Must be arranged in consultation with a botany faculty member and the work supervisor. Offered S/U only. *Prerequisites:* junior or senior standing, 3.000 GPA, declared major in botany or biology, and approval by a botany faculty member and work supervisor.
- 5000. Graduate Seminar. 1-3 (Max. 6).** Selected topics on current research in the botanical sciences. Offered satisfactory/unsatisfactory only. *Prerequisite:* 15 hours of botany or biology.
- 5060. Fundamental Concepts in Evolution. 3.** Explores fundamental concepts in evolutionary biology including evolutionary ecology, population genetics, and speciation with an emphasis on both theoretical frameworks and practical applications. Discussion included. Cross listed with ECOL./ZOO 5060. *Prerequisite:* graduate student in good standing.
- 5150. Research in Remote Sensing. 1-6 (Max. 6).** Independent research into problems on the remote sensing of vegetation using satellite technology. *Prerequisite:* graduate standing and consent of instructor.
- 5200. Plant-Microbe Interactions. 3.** This course is designed to improve content knowledge in Microbiology, with a specific focus on plant-microbe interactions and their application to ecology, conservation, agriculture, and rangeland management, and to enhance oral presentation skills. Dual listed with BOT 4200.
- 5235. Marine Biology. 3.** This course explore major topics of physical oceanography, marine biodiversity and ecology, and human impacts on the ocean. Emphasis is placed on reading, evaluating, and synthesizing primary literature. Dual listed with BOT 4235. Cross listed with ZOO 5235. *Prerequisite:* graduate standing.
- 5280. Paleobotany. 4.** An examination of the ecology and evolution of land plants throughout Earth history that emphasizes the profound impact plants have had on Earth's surface and atmosphere. Through a combination of lecture, discussion, and laboratory, the course will explore fossilized plant communities, their ecological properties, and effects of major environmental upheavals. Dual listed with BOT 4280. Cross listed with GEOL 5280. *Prerequisite:* graduate standing.
- 5320. Research in Mycology. 1-3 (Max. 6).** *Prerequisite:* graduate standing or consent of instructor.
- 5395. Symbiosis. 3.** Symbiosis, the living together of unlike organisms, encompasses mutually beneficial to reciprocally detrimental interactions. The course examines conditions required for establishment and maintenance of important symbioses including mycorrhizae, lichens, endophytes, nitrogen-fixing and endosymbiotic bacteria, fungal/insect interactions, and fungal pathogens. Symbioses in forest ecosystems will be emphasized. Dual listed with BOT 4395. *Prerequisites:* LIFE 2022 or LIFE 2023, and LIFE 3400.
- 5420. Research in Physiology. 1-6 (Max. 6).** *Prerequisite:* graduate standing and consent of instructor.
- 5480. Spatial Information Sciences Seminar. 1.** There are many earth science technologies, remote sensing, GIS and GPS. Synergism among these technologies increase the range of solutions for research and management. This course is a forum for presentation of these solutions or questions requiring solutions. Cross listed with GEOL 5480. *Prerequisite:* a course in remote sensing, GIS, GPS, and graduate standing.
- 5550. Computational Biology. 4.** Introduces concepts and skills that are generally applicable to computational analysis of biological questions. Content is motivated by applied projects that require basic computer programming for analysis. Two computer languages are introduced and utilized. Dual listed with BOT 4550. *Prerequisites:* MATH 2200 or STAT 2050 or equivalent; LIFE 1010 or equivalent.
- 5555. Computational Biol Practicum. 3.** Students will perform computational analysis of data to address contemporary biology questions for clients. Teams of students will work together, with consultation and direction from the instructor, to perform analyses, answer scientific questions, and report findings to a client, using best practices in report generation and reproducible research. *Prerequisite:* BOT 4550/5550.
- 5600. Ecological Modeling. 3.** Course will immerse students in the most important and fundamental statistical modeling techniques for data analysis. Each class will include theoretical content delivered through a brief lecture and the immediate application of the theory through activities using R software. *Prerequisite:* STAT 2050, STAT 3050, or an equivalent course.
- 5610. Research in the Taxonomy of Vascular Plants. 1-6 (Max. 6).** The University of Wyoming is especially well equipped for research on the classification of native plants. The Rocky Mountain Herbarium offers an abundance of material for study and the library is especially rich in taxonomic literature. Monographic work may be done on an assigned genus or on the plants of a limited area. Cytological, anatomical, and biochemical techniques may be employed in the solution of certain problems. *Prerequisite:* graduate standing and consent of instructor.
- 5650. Readings in Plant Systematics. 1 (Max. 6).** Centered on readings involving selected topics in the current plant systematics literature. *Prerequisite:* BOT 4680.
- 5664. Topics: Evolution. 1-4 (Max. 12).** Advanced topics in evolutionary biology are engaged by studying primary research and topical syntheses in the current literature. Dual listed with BOT 4664. *Prerequisite:* LIFE 3500 or equivalent.

5665. Research in Evolutionary Biology. 1-6 (Max. 6). *Prerequisite:* graduate standing and consent of instructor.

5690. Special Topics in Systematics. 1-4 (Max. 12). Designed to acquaint students with various topics not covered in regular courses. Emphasis is placed on recent developments in the journal literature. *Prerequisite:* BOT 4680 or 5680 or equivalent.

5700. Vegetation Ecology. 4. The ecology of major vegetation types, with emphasis on patterns of vegetation distribution, vegetation-environment relationships, succession, the effect of fire and management decisions, and methods of vegetation analysis. Dual listed with BOT 4700. *Prerequisite:* LIFE 3400.

5710. Research in Ecology. 1-6 (Max. 6). *Prerequisite:* graduate standing and consent of instructor.

5720. Research in Physiological Ecology. 1-6 (Max. 6). *Prerequisite:* graduate standing and consent of instructor.

5730. Plant Physiological Ecology. 4. Acquaints advanced students with environmental factors which affect the establishment and growth of plants. Emphasizes adaptive mechanisms. Lecture with inclusive hands-on laboratory. Dual listed with BOT 4730; cross listed with RNEW 5730. *Prerequisite:* one course in ecology and one in physiology.

5745. Terrestrial Ecosystem Ecology. 3. Advanced course examines fundamental ecosystem functions and their relationship to ecosystem structure using a systems approach. Study cycles of carbon, water and nutrients through ecosystem components with an emphasis on interactions among plants, soil, and the atmosphere. Current readings focus on responses of terrestrial ecosystems to global climate change and human disturbance. Dual listed with BOT 4745. *Prerequisite:* one course in ecology.

5750. Seminar in Ecophysiology. 1-3 (Max. 8). *Prerequisite:* 1 course in physiology and 1 course in ecology.

5775. Forest Ecology. 4. Integrative study of the structure, function, and ecological diversity of forested ecosystems, and the physical factors that influence this diversity, including emergent properties of energy flow and nutrient cycling. Special emphasis is given to understanding forest disturbances and succession, and implications for impacts of management and sustainability are discussed throughout. Dual listed with BOT 4775; cross listed with ECOL/RNEW 5775. *Prerequisite:* LIFE 3400.

5780. Biogeochemistry. 3. A comprehensive treatment of biogeochemistry with emphasis on biogenic elements and biological processes. Reviews occurrence of elements, their behavior

in the biosphere, and how their cycles are affected by humans. Dual listed with BOT 4780. Cross listed with ESS 5780. *Prerequisite:* Consent of instructor.

5790. Special Topics in Ecology. 1-3 (Max. 6). Designed to acquaint advanced students with various topics not covered in other courses. Emphasis is placed on recent developments appearing in the journal literature. Dual listed with BOT 4790. *Prerequisite:* two courses in ecology.

5900. Practicum in College Teaching. 1-3. (Max 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrolled in a graduate degree program.

5980. Dissertation Research. 1-12 (Max. 48). Graduate level course designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrolled in a graduate level degree program.

Chemistry

204 Physical Sciences Building,
(307) 766-4363

FAX: (307) 766-2807

Web site: www.uwyo.edu/chemistry

Department Head: Debashis Dutta

Professors:

DAVID T. ANDERSON, B.S. George Washington University 1987; Ph.D. Dartmouth College 1993; Professor of Chemistry 2012, 2000.

FRANCO BASILE, B.S. University of Wisconsin-Eau Claire 1986; Ph.D. Purdue University 1992; Associate Professor of Chemistry 2009, 2003.

EDWARD L. CLENNAN, B.S. University of Wisconsin-River Falls 1973; Ph.D. University of Wisconsin-Madison 1977; Professor of Chemistry 1989, 1979.

DEBASHIS DUTTA, B. Tech Indian Institute of Technology 1998; Ph.D. University of Notre Dame 2003; Professor of Chemistry 2017, 2006.

BRUCE A. PARKINSON, B.S. Iowa State University 1972; Ph.D. California Institute of Technology 1977; Professor of Chemistry 2008.

Associate Professors:

JOHN O. HOBERG, B.A. Jamestown College 1984; Ph.D. Montana State University 1990; Associate Professor of Chemistry 2004.

ELLIOTT HULLEY, B.S. Ursinus College 2005; Ph.D. Cornell University 2011; Assistant Professor of Chemistry 2014.

TERESA LEHMANN DELLA VOLPE, B.S. Universidad Central de Venezuela 1987; Ph.D. University of Minnesota 1997; Associate Professor of Chemistry 2014, 2008.

BRIAN M. LEONARD, B.S. University of Nebraska at Kearney 2003; Ph.D. Texas A&M 2008; Associate Professor of Chemistry 2016, 2010.

JING ZHOU, B.S. Xiamen University 1997; Ph.D. University of South Carolina 2004; Associate Professor of Chemistry 2013, 2007.

Assistant Professors:

CALEB M. HILL, B.S. Jacksonville State University 2009; Ph.D. University of Alabama 2014; Assistant Professor of Chemistry 2016.

LAURA RITA DE SOUSA OLIVEIRA, B.S. New Mexico Institute of Mining and Technology 2010; Ph.D. University of California, Riverside 2017; Assistant Professor of Chemistry 2020.

MICHAEL T. TAYLOR, B.S. Salisbury University 2006; Ph.D. University of Delaware 2013; Assistant Professor of Chemistry 2017.

Research Faculty:

NAVAMONEY ARULSAMY, B.Sc. Madurai-Kamaraj University, India 1982; M.Sc. 1986; Ph.D. University of Hyderabad, India 1991; Senior Research Scientist 2013, 2005.

ALEXANDER GORONCY, B.S. University of Bremen; Ph.D. University of South Carolina; Research Scientist 2015.

Adjunct Professors:

YURI DAHNOVSKY, Ph.D. Institute of Chemical Physics, Moscow 1983; Adjunct Professor of Chemistry 2001.

MAOHONG FAN, Ph.D. Osaka University 2003; Professor in SER and CEAS; Adjunct Professor in Chemistry 2009.

Senior Lecturer:

CARLA DEE BECKETT, B.S. University of Wyoming 1991; M.S. 2007; Senior Lecturer of Chemistry 2012, 2011.

RACHEL WATSON, Senior Lecturer in Chemistry.

Assistant Lecturers:

KUI CHEN, B.Sc. Xiamen University 1997; Ph.D. University of South Carolina 2004; Assistant Lecturer of Chemistry 2019.

GINKA S. KUBELKA, M.S. University of Wuerzburg, Germany 2010; Ph.D. University of Wyoming 2015. Assistant Lecturer of Chemistry 2016.

Professors Emeritus:

Vernon Archer, Daniel A. Buttry, Keith T. Carron, Robert Corcoran, Clyde Edmiston, Anthony Guzzo, Suzanne Harris, Robert Hurtubise, David Jaeger, John Maurer, E.G. Meyer, David A. Nelson, Dean M. Roddick

Senior Lecturer Emeritus:

Patricia A. Goodson

Chemistry is one of the fundamental physical sciences dealing with the structure and properties of matter, along with changes that matter undergoes. Chemistry's scope encompasses all substances, living and non-living. Its study and practice include (1) the theoretical and experimental aspects of chemical bonding and structure using computational, spectroscopic, and diffraction techniques; (2) the laboratory synthesis from simple starting materials of desirable compounds in the inorganic, organic and biological classes; and (3) the total analysis of complex mixtures using modern spectroscopic and electrochemical methods. Since we live in a material world, applications of chemical knowledge influence most areas of human endeavor: scientific, economic, political and social. Many of the advances in the areas of new materials, medicines, biotechnology, food production, new energy sources and semiconductor technology associated with the "computer revolution" are based on chemistry and chemical principles. Some understanding of these chemical principles should be part of every educated person's knowledge.

Because of the broad scope of this discipline, the Department of Chemistry offers a variety of courses and programs. These programs meet the needs of students planning professional careers in chemistry and those wishing to major in chemistry for other objectives. In particular, chemistry is a traditional preprofessional major for students interested in medicine and dentistry. Specific courses are offered to serve other major areas and as part of University Studies and A&S core requirements.

Students who have taken an AP examination and have received a score of 4 or 5 may receive credit for CHEM 1020 and 1030.

Undergraduate Major

The department offers **both**, B.A. and B.S. degree programs. The B.A. degree includes a minimum of 32 hours of chemistry. The Plan 1 B.S. degree requires at least 38 hours. The Plan 2 B.S. requires 46 hours of chemistry courses. Since the chemistry required in the first two years of all programs is the same, students interested in pursuing a chemistry major can elect any program initially. Discussions with a departmental adviser will allow students to choose the most appropriate major for their career objectives. In general, students planning graduate work in chemistry should elect one of the B.S. programs. The B.A. program has a more liberal content with additional electives. It would support careers in business, law and advanced study in areas needing a strong chemistry background such as toxicology or forensic science.

A B.A. is suitable for students in the College of Education who wish to obtain an A&S degree, and may also be appropriate for some premedical tracks. The Plan 2 (CACS) program is designed to meet standards set by the American Chemical Society (ACS). A student who completes the Plan 2 B.S. program will be certified by the Department of Chemistry to the ACS as having met the specific ACS requirements for undergraduate professional training in chemistry. Students must obtain a grade of C- or higher in each of the chemistry, physics or math courses specifically required for their degree.

Plan 1 B.A. in Chemistry

(32 hours of chemistry)

Course Requirements	Hrs.
Basic chemistry	26
1050 and 1060 (or 1020 and 1030), 2230, 2420 and 2440, 3550 or 4507, and 4110	
Additional upper-level chemistry	6
(including one of the following: 4100, 4230, or 4530)	
MATH 2200 and 2205	8
PHYS	8
1310 and 1320 (or 1110 and 1120 or 1210 and 1220)	
Additional USP requirements	21
Additional A&S core requirements	6
Electives	45
Minimum Total Hrs.	120

Plan 1 B.S. in Chemistry

(38 hours of chemistry)

Course Requirements	Hrs.
Basic chemistry	34
1050 and 1060 (or 1020 and 1030), 2230, 2420 and 2440, 4000 (1 hour), 4100, 4110, 4507, 4508, 4525 and 4530	
CHEM 4930	2
Additional upper-level chemistry	3
MATH 2200, 2205 and 2210	12
PHYS	8
1310 and 1320 (or 1210 and 1220)	
Additional USP requirements	21
Additional A&S core requirements	6
Electives	34
Minimum Total Hrs.	120

Plan 2 B.S. in Chemistry (CACS)

(46 hours of chemistry)

Course Requirements	Hrs.
Basic chemistry	41-42
1050 and 1060 (or 1020 and 1030), 2230, 2420 and 2440, 4400 (or MOLB 3610 or 4600), 4000 (1 hour), 4100, 4110, 4230, 4507, 4508, 4525 and 4530	
CHEM 4930	3
Additional upper-division chemistry	2-3
MATH 2200, 2205 and 2210	12
PHYS 1310 and 1320	8
(or 1210 and 1220)	
Computer science	3
(STAT 2050, CHEM 4515, COSC 1010)	
Additional USP requirements	21
Additional A & S core requirements	6
Program supporting courses	18
A group of courses selected to further the career objectives of the individual student. These are chosen after consultation with the departmental adviser and must subsequently be approved by the departmental Undergraduate Studies Committee. A grade of C- or higher is required for all program supporting courses.	
Electives	4-6
Minimum Total Hrs.	120

Suggested Program for a Bachelor's Degree in Chemistry

(Freshman and Sophomore Years)

Suggested Course Sequence

FRESHMAN YEAR: Fall	Hrs.
CHEM 1050 or 1020	4
ENGL 1010	3
MATH 2200	4
A&S Core or University Studies Requirements	3-4
Total Hrs.	14-15

FRESHMAN YEAR: Spring	Hrs.
CHEM 1060 or 1030.....	4
MATH 2205.....	4
A&S core or University Studies requirements.....	6-8
Total Hrs.	14-16

SOPHOMORE YEAR: Fall	Hrs.
CHEM 2420.....	4
MATH 2210 (B.S. requirement).....	4
PHYS 1310 or 1210 or 1110.....	4
A&S core or University Studies requirements.....	3-4
Total Hrs.	15-16

SOPHOMORE YEAR: Spring	Hrs.
CHEM 2440.....	4
CHEM 2230.....	5
PHYS 1320 or 1220 or 1120.....	4
A&S core or University Studies requirements.....	3-4
Total Hrs.	15-16

Undergraduate Minor

A minor is offered in the Department of Chemistry. Further information may be found at the web site www.uwyo.edu/chemistry.

Teacher Education

Teacher certification requirements are available through the College of Education. Students preparing to teach chemistry in the secondary schools are advised to take a major in chemistry or a major composed of carefully selected courses in chemistry and related sciences.

A special interdisciplinary curriculum in chemistry and a related area may be arranged. (See department head for information).

Graduate Study

The Department of Chemistry offers programs leading to the degrees of master of science and doctor of philosophy chemistry. The master's degree is offered mainly under Plan A with Plan B reserved for special circumstances.

The department also participates in the preparation of students for the degrees of master of science in natural science and master of science in teaching (M.S.T.), which are designed to improve the competence of those engaged in science teaching.

Program Specific Admission Requirements

In addition to the minimum requirements set forth in this *Catalog*, the Department of Chemistry requires that a student have taken the following undergraduate courses: one year

of general chemistry; one semester/quarter of quantitative analysis; one year of organic chemistry plus laboratory; one year of physical chemistry plus laboratory; one year of physics; and mathematics through multivariable calculus. As appropriate, one or more of these course requirements may be waived at the discretion of the department.

Program Specific Degree Requirements

Master's Program Plan A (thesis)

In addition to fulfilling the minimum university requirements, a student must take one 3 hour course in each of three of the four areas (inorganic, analytical, organic, and physical), excluding special topics and research courses. These courses must be graduate courses, 5000 and above.

A student may also take 9 credits of any combination of CHEM 5190, 5290, 5390, 5590, or 5790.

One departmental seminar is required to be presented on the thesis research.

Doctoral Program

In addition to fulfilling the minimum university requirements, a student must take one 3 hour graduate course (5000 and above) in each of the four areas (inorganic, analytical, organic, and physical), excluding special topics, tool courses 5130, 5320, 5760, and research courses.

A student may also take 12 credits of any combination of CHEM 5190, 5290, 5390, 5590, or 5790.

In the area selected as a major, the student will take the following as a minimum:

1. Analytical - 5250 plus 9 hours of graduate level analytical courses;
2. Inorganic - 12 hours of graduate level inorganic courses;
3. Organic - 5320, 5330, 5340 and 5350;
4. Physical - any three graduate level physical chemistry courses;

Students must obtain satisfactory performance on a series of written major field cumulative examinations, including special topics.

Students must obtain satisfactory performance on a preliminary examination, part written and part oral.

Students must present a seminar based on the dissertation research. Students must also obtain two additional credits of CHEM 5000 by presenting a divisional or departmental seminar or an oral presentation at a regional or national research meeting.

Chemistry (CHEM)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◆Q]).

1000. Introductory Chemistry. 4. [SP◆PN]

Deals with principles of chemistry and some applications to inorganic chemistry. For students in family and consumer sciences, nursing, education, general arts and sciences and most agriculture curricula. Students who have credit in CHEM 1020 or 1050 may not receive duplicate credit for this course. Laboratory and discussion: 3 hours per week. *Prerequisite:* Minimum grade of C in MATH 0925, or level 3 on the MPE, or ACT math score of 23 or above. (Normally offered fall semester)

1001. The Chemical Community. 1. [I,L◆(none)]

A survey of chemistry both as a major and a discipline. Chemistry's historical role, the scientific method, scientific ethics, as well as current challenges in the major fields of chemistry are discussed. Information literacy is strongly emphasized, both by familiarization with university resources as well as specialized chemical databases. (Normally offered fall semester)

1020. General Chemistry I. 4. [SP◆PN]

First semester of a one-year introductory series. Provides broad coverage of chemistry principles with inorganic and organic systems applications. Credit will not be allowed for more than one of CHEM 1020, 1050 and 1000. Laboratory and discussion: 3 hours per week. *Prerequisite:* ACT Math score of 23 or above, or concurrent enrollment in Math 1400, or 1405 or 1450.

1030. General Chemistry II. 4. [SP◆PN]

Second semester of a one-year introductory series. Provides broad coverage of chemistry principles with inorganic and organic systems applications. Credit will not be allowed for more than one of CHEM 1030 and 1060. Laboratory and discussion: 3 hours per week. *Prerequisite:* CHEM 1020.

1050. Advanced General Chemistry I. 4. [SP◆PN]

First semester of a one-year series covering chemical principles. Emphasizes inorganic chemistry and briefly discusses qualitative analysis. Credit not given for more than one of CHEM 1020, 1050 and 1000. Laboratory: 3 hours per week. *Prerequisites:* one year high school chemistry, and an ACT Math score of 27 or higher or concurrent enrollment in Math 2200. (Normally offered fall semester)

1060. Advanced General Chemistry II. 4. [SP◆PN]

Second semester of a one-year series covering chemical principles. Emphasizes inorganic chemistry and briefly discusses qualitative analysis. Credit not given for more

than one of CHEM 1030 and 1060. Laboratory: 3 hours per week. *Prerequisite:* CHEM 1050 or CHEM 1020, with permission of the instructor. (Normally offered spring semester)

2000. Special Topics in the Laboratory. 1 (Max. 4). Introduces students to laboratory experience in chemistry. *Prerequisite:* special permission from the chemistry department.

2230. Quantitative Analysis. 5. Broad, general coverage of analytical techniques, principles and calculations. Laboratory: 6 hours per week. *Prerequisite:* CHEM 1030, 1060 or equivalent. (Normally offered spring semester)

2300. Introductory Organic Chemistry. 4. Terminal course in organic and beginning biological chemistry. No credit will be allowed in CHEM 2300 if credit earned in CHEM 2420. *Prerequisite:* CHEM 1020, 1050, 1000 or equivalent. Note: This course is **not** an acceptable prerequisite for CHEM 2440. (Normally offered spring semester)

2420. Organic Chemistry I. 4. First semester of a one-year sequence in organic chemistry. Approached from the viewpoint of modern chemical theory, emphasizing structural and mechanistic concepts. The course incorporates a laboratory integrated with the lecture. Students desiring a one-semester terminal course should take CHEM 2300. Laboratory: 3 hours per week. No credit allowed in CHEM 2420 if credit earned in 2300. *Prerequisite:* CHEM 1030 or 1060. (Normally offered fall)

2440. Organic Chemistry II. 4. Second semester of a one-year sequence in organic chemistry. Approached from viewpoint of modern chemical theory, emphasizing structural and mechanistic concepts. The course incorporates a laboratory integrated with the lecture. Students desiring a one-semester terminal course should take CHEM 2300. Laboratory: 3 hours per week. *Prerequisites:* CHEM 1030 or 1060 and 2420. *Note:* CHEM 2300 is not an acceptable prerequisite for CHEM 2440. (Normally offered spring semester)

3020. Environmental Chemistry. 3. Environment and modern environmental problems in terms of chemical structures and reactions. Chemical principles of equilibrium, kinetics, and thermodynamics are used to help understand our changing environment. Topics include toxicological chemistry, aquatic chemistry, atmospheric chemistry, and green chemistry. *Prerequisites:* CHEM 2300 or 2420; 2230; and QA course.

3550. Physical Chemistry for the Life Sciences. 3. Deals with areas of physical chemistry of interest to students majoring in the life sciences. Covers thermodynamics, kinetics, equilibrium and spectroscopy, using biologi-

cal systems for development and illustration. Credit is allowed for only one of the courses: CHEM 3550 or 4507. *Prerequisites:* CHEM 1030, MATH 2200. (Normally offered every other year)

4000. Career Skills. 1. Designed to develop skills needed for success in the chemical profession or in graduate school. Topics include information on graduate programs, resume preparation, scientific writing, oral presentation, technical seminars, and laboratory note keeping. Available S/U only. *Prerequisites:* chemistry major, CHEM 4110 or concurrent enrollment. (Normally offered fall semester)

4040. Chemical Literature. 1-2 (Max. 2). Introduces literature of chemistry and methods employed in searching the literature. *Prerequisites:* CHEM 2300 or 2420; CHEM 4507 or 3550 or concurrent enrollment. (Normally offered alternating spring semesters)

4050. Solar Energy Conversion. 3. Provides an overview of the science behind current and future solar thermal and photovoltaic technologies. Environmental aspects, legal issues and cost associated with solar energy will also be included. Cross listed with ERS 4050. *Prerequisites:* CHEM 1030 or CHEM 1060 and PHYS 1210 or PHYS 1310 and MATH 2200. (Offered spring semester)

4100. Inorganic Chemistry Laboratory. 2. Introduces basic inorganic laboratory synthetic techniques and methods of analysis. *Prerequisite:* CHEM 2440 and 4110 or concurrent enrollment. (Offered fall semester)

4110. Introductory Inorganic Chemistry. 3. A basic course on theoretical and descriptive inorganic chemistry. *Prerequisite:* CHEM 2420, and physical chemistry. (Normally offered fall semester)

4230. Instrumental Methods of Chemical Analysis. 5. Introduces optical, electro-analytical and separation methods of analysis, emphasizing practical industrial applications. *Prerequisite:* CHEM 2230. (Normally offered fall semester)

4400. Biological Chemistry. 3. Covers the main principles of biological chemistry from a chemical standpoint. Highlights the chemical structure of biological molecules and examines biological processes with emphasis on the underlying organic chemistry. Introduces biological NMR spectroscopy and other biophysical methods. Discusses main metabolic pathways. Dual listed with CHEM 5400. *Prerequisite:* CHEM 2440 or consent of instructor

4507. Physical Chemistry I. 3. First semester of a one-year sequence. Emphasis on introductory quantum mechanics, atomic structure, molecular bonding and structure

and spectroscopy. Kinetic molecular theory of gasses may be introduced. Uses multivariable calculus, differential equations and some linear algebra. *Prerequisites:* one year of general chemistry, multivariable calculus, one year of general college physics. (Normally offered fall semester)

4508. Physical Chemistry II. 3. Second semester of a one year sequence, emphasizes kinetic theory of gasses and non-ideal solutions, chemical equilibrium, electrochemistry, statistical thermodynamics, and reaction kinetics. Uses multivariable calculus and differential equations. *Prerequisite:* CHEM 4507. (Normally offered spring semester)

4515. Applied Mathematics in Physical Chemistry I. 3. Designed to introduce the necessary mathematical background and essential computer programming tools for students of physical and theoretical chemistry. This includes an introduction into linear algebra, multivariate calculus, differential equations, analysis and modeling of experimental data, use of Matlab software and mathematical analysis of physical chemistry problems. Dual listed with CHEM 5515. *Prerequisites:* MATH 2200 and 2205, CHEM 1020/1030 or 1050/1060.

4516. Applied Mathematics in Physical Chemistry II. 3. Covers the advanced mathematical techniques in physical and theoretical chemistry. This includes introduction into probability and stochastic processes, infinite series, vector and tensor calculus, Fourier transforms and partial differential equations. Includes practical numerical problem solutions using MatLab software and applications of the mathematical analysis to specific physical chemistry problems. Dual listed with CHEM 5516. *Prerequisite:* CHEM 4515.

4525. Physical Chemistry Lab I. 1. Illustrates principles of physical chemistry, techniques of measurement, and analysis and interpretation of data with an emphasis on quantum mechanical (spectroscopic) methodologies. *Prerequisites:* CHEM 4507 or concurrent enrollment.

4530. Physical Chemistry Laboratory II. 1. Illustrates principles of physical chemistry, techniques of measurement, and analysis and interpretation of data with emphasis on thermodynamics and kinetics. Laboratory: 3 hours per week. *Prerequisite:* CHEM 4508 or concurrent enrollment. (Normally offered spring semester)

4560. Molecular Modeling - Computational Chemistry. 3. Emphasizes practical training in computational modeling of molecular properties using modern computer software. Includes ab-initio quantum mechanical,

density functional, semi-empirical and molecular mechanics methods. Dual listed with CHEM 5560. Laboratory: 3 hours per week. *Prerequisite:* CHEM 4507. (Normally offered alternating spring semesters)

4920. Special Problems in Chemistry. 1-3 (Max. 6). Probes deeply into special areas of chemistry through library or laboratory work. Taken under supervision of faculty in the area of the investigation. Laboratory: 3-9 hours per week. *Prerequisite:* consent of instructor. (Offered every semester)

4930. Undergraduate Research. 1-3 (Max. 9). Research activities on a chemical project of limited scope or as part of a laboratory project of great scope. A written report is submitted to the department each semester of enrollment. Laboratory: 4-12 hours per week. *Prerequisites:* chemistry major and consent of instructor. (Offered every semester)

The following courses are offered for S/U credit only: CHEM 5000, CHEM 5150, CHEM 5190, CHEM 5290, CHEM 5310, CHEM 5390, CHEM 5501, CHEM 5590, CHEM 5790, CHEM 5900, CHEM 5920, CHEM 5940, CHEM 5960, CHEM 5980, and special sections of CHEM 5100, CHEM 5200, CHEM 5300, and CHEM 5500 offered during Summer Session.

5000. Seminar in Chemistry. 1 (Max. 3). All graduate students attend weekly departmental seminars. One credit given each semester a presentation is made, to a limit of 3 credits for M.S. candidate, 6 for Ph.D. candidates. The seminar will normally be based upon articles in the current chemical literature but with the last presentation being over the student's research project. Offered satisfactory/unsatisfactory only. *Prerequisite:* graduate standing in chemistry or biochemistry.

5100. Special Topics in Advanced Inorganics. 1-9 (Max. 12). A course designed for students with an interest in contemporary inorganic chemistry. Recent problems in the literature and techniques for their solution will be addressed.

5111 [5110]. Advanced Inorganic Chemistry. 3. A graduate-level course on theoretical and descriptive inorganic chemistry. Topics will include molecular symmetry, spectroscopy, electronic structure/bonding, magnetism, electron transfer, and catalysis. *Prerequisites:* CHEM 2420, CHEM 4110 and CHEM 3550 or 4507.

5115. Descriptive Inorganic Chemistry. 3. Advanced survey of inorganic chemistry, emphasizing the synthesis, structural, and reactivity properties of inorganic compounds.

Emphasis will be placed on the application of bonding theory and periodic principles to the chemistry of main-group, d-block, and f-block elements. *Prerequisite:* CHEM 4110, CHEM 5110 or CHEM 5111.

5140. Organometallic Chemistry. 3. A survey of bonding and synthetic reactions of transition metal organometallic chemistry. *Prerequisite:* CHEM 4110/5110.

5150. Inorganic Group Seminar. 1 (Max. 9). Course designed for students with an interest in contemporary inorganic chemistry. Recent problems in the literature and techniques for their solution are addressed.

5190. Research in Inorganic Chemistry. 1-3 (Max. 12). Offered satisfactory/unsatisfactory only. *Prerequisite:* CHEM 4110/5110.

5200. Special Topics in Analytical Chemistry. 1-6 (Max. 12). Material selected from chromatography, electroanalytical chemistry, ion exchange, chemical separations, optical methods of analysis, polarography and other areas. *Prerequisite:* CHEM 4230, 4507.

5220. Modern Electroanalytical Methods. 3. An advanced survey of electroanalytical chemistry including ion selective potentiometry, electrolysis, coulometry, polarography and voltammetry.

5240. Optical Methods of Chemical Analysis. 3. An advanced survey of the theory, instrumentation and applications of optical methods of chemical analysis. *Prerequisite:* CHEM 4230, 4507.

5250. Advanced Chemical Instrumentation. 3. Introduces chemistry students to the basic elements of electronics. Specific topics include networks, passive and active filters, digital electronics, logic gates, counters, flip-flops, and converters. Second half of course introduces students to experimental design, pattern recognition, factorial analysis, and multivariate statistical methods. *Prerequisite:* CHEM 4230 or its equivalent.

5260. Separation Methods. 3. A detailed survey of the theoretical and practical aspects of modern separation methods with emphasis on chromatography. *Prerequisite:* CHEM 2230, CHEM 2440, and CHEM 4508.

5290. Research in Analytical Chemistry. 1-3 (Max. 12). Satisfactory/unsatisfactory only. *Prerequisite:* CHEM 2230, 4507.

5300. Special Topics Synthetic. 1-6 (Max. 9). Material will be selected from one of the following areas: heterocycles, organometallics, natural products, physical and chemical methods of structure elucidation, organic photochemistry, and other special areas of organic chemistry. *Prerequisite:* CHEM 5330.

5310. Organic Group Seminar. 1 (Max. 9). Designed for students with an interest in organic reaction mechanisms. A problem solving approach using electron pushing techniques will be emphasized. *Prerequisite:* CHEM 5340.

5320. Spectroscopic Methods of Structure Determination. 3. Provides theoretical and practical treatment of spectroscopic methods for application in research. Topics include ultraviolet, infrared, and nuclear magnetic resonance spectroscopy and mass spectrometry. *Prerequisite:* CHEM 2440, 4507.

5330. Advanced Organic Chemistry. 3. Treatment of organic chemistry from the viewpoints of structure and mechanism with emphasis on structural theory of bonding, stereochemistry and the general classes of organic reactions. *Prerequisite:* CHEM 2440 and 4507.

5340. Synthetic Methods in Organic Chemistry. 3. Surveys and applies the important synthetic methods of organic chemistry with particular attention to recent developments. *Prerequisite:* CHEM 5330.

5390. Research in Organic Chemistry. 1-3 (Max. 12). *Prerequisite:* CHEM 5320.

5400. Biological Chemistry. 3. Covers the main principles of biological chemistry from a chemical standpoint. Highlights the chemical structure of biological molecules and examines biological processes with emphasis on the underlying organic chemistry. Introduces biological NMR spectroscopy and other biophysical methods. Discusses main metabolic pathways. Dual listed with CHEM 4400. *Prerequisite:* CHEM 2440 or consent of instructor.

5500. Special Topics in Physical Chemistry. 1-6 (Max. 9). Material will be selected from one of the following fields: electrochemistry, surface chemistry, catalysis, colloids, photochemistry, and other special fields of physical chemistry. *Prerequisite:* CHEM 4507 and 5510.

5501. Physical Group Seminar. 1-9 (Max. 9). Designed for students with an interest in theoretical and experimental physical chemistry. Students are required to give presentations on current literature and research topics. *Prerequisite:* graduate standing.

5515. Methods of Applied Mathematics in Physical Chemistry I. 3. Designed to introduce the necessary mathematical background and essential computer programming tools for students of physical and theoretical chemistry. Includes an introduction into linear algebra, multivariate calculus, differential equations, analysis and modeling of experimental data, use of Matlab software, and mathematical analysis of physical chemistry problems. Dual listed with CHEM 4515. *Prerequisites:* MATH 2200 and 2205, 1 yr. CHEM 1020/1030 or 1050/1060.

5516. Applied Mathematics in Physical Chemistry II. 3. Covers the advanced mathematical techniques in physical and theoretical chemistry. This includes an introduction into probability and stochastic processes, infinite series, vector and tensor calculus, Fourier transforms and partial differential equations. Includes practical numerical problem solutions using Matlab software and applications of the mathematical analysis to specific physical chemistry problems. Dual listed with CHEM 4516. *Prerequisites:* CHEM 4515/5515.

5530. Quantum Chemistry. 3. The quantum mechanical description of time-dependent and independent processes, including discussions of the Schrodinger equation, wave packets, approximate methods, and interaction of matter with radiation. *Prerequisite:* two semesters of undergraduate physical chemistry.

5540. Molecular Spectroscopy. 3. Introduction to the relationships among quantum mechanical formulations, experimentally determinable quantities obtained via spectroscopic methods, and physical parameters related to the structure of molecular systems. *Prerequisite:* CHEM 5530.

5560. Molecular Modeling - Computational Chemistry. 3. Emphasizes practical training in computational modeling of molecular properties using modern computer software. Includes ab-initio quantum mechanical, density functional, semi-empirical and molecular mechanics methods. Dual listed with CHEM 4560. Laboratory: 3 hours per week. *Prerequisite:* CHEM 4507. (Normally offered alternating spring semesters)

5590. Research in Physical Chemistry. 1-3 (Max. 12). *Prerequisite:* CHEM 4507.

5790. Research in Biological Chemistry. 1-3 (Max. 12). *Prerequisite:* consent of instructor.

5820. Advanced Problems in Chemistry. 1-3 (Max. 3). A graduate level course for students desiring to probe more deeply into a special area of chemistry. Taken under the supervision of a faculty member in the field of investigation. *Prerequisite:* consent of instructor.

5900. Practicum in College Teaching. 1-3 (Max 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrolled in a graduate degree program.

5980. Dissertation Research. 1-12 (Max. 48). Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisites:* enrolled in a graduate level degree program.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

Communication and Journalism

223 Ross Hall, (307) 766-3122

FAX: (307) 766-5293

Web site: www.uwyo.edu/COJO

Department Chair: Cindy Price Schultz

Professor:

TRACEY OWENS PATTON, B.A. Colorado State University 1993; M.A. 1996; Ph.D. University of Utah 2000; Professor of Communication and Journalism 2012, 2003.

Associate Professors:

CHIA FANG (SANDY) HSU, B.A. Chinese Culture University 1995; M.A. Washington State University 1997; Ph.D. Washington State University 2002; Associate Professor of Communication and Journalism 2009, 2003.

KRISTEN D. LANDREVILLE, B.S. University of Florida 2004; M.A. 2006; Ph.D. Ohio State University 2010; Associate Professor of Communication and Journalism 2017, 2010.

LI LI, B.A. Hebei Normal University 2001; M.A. China University of Mining and Technology 2004; M.A. Ohio University 2009; Ph.D. 2012; Associate Professor of Communication and Journalism 2019, 2012.

CINDY J. PRICE SCHULTZ, B.A. University of Sioux Falls 1989; M.S. South Dakota State University 1992; Ph.D. Southern Illinois University 2000; Associate Professor of Communication and Journalism 2005, 1999.

Assistant Professor:

KATHRYN (KAATIE) COOPER, B.S. Trinity University 2008; M.A. Ohio State University 2013; Ph.D. 2018; Assistant Professor of Communication and Journalism 2019.

Senior Lecturers:

BEAU BINGHAM, B.S. Idaho State University 2000; M.A. New Mexico State University 2002; Senior Lecturer of Communication and Journalism 2007, 2003.

JUSTIN STEWART, B.A. University of Wyoming 2003; M.A. 2005; Senior Lecturer of Communication and Journalism 2017, 2005.

Assistant Lecturers:

MATTHEW LIU, B.A. University of Mary Washington 2009; M.A. Wake Forest University 2014; Assistant Lecturer of Communication and Journalism 2019.

MITZI STEWART, B.A. University of Wyoming 2007; M.A. 2015; Assistant Lecturer of Communication and Journalism 2019.

Emeriti:

Michael R. Brown, B. Wayne Callaway, William C. Donaghy, George A. Gladney, John W. Ravage, Kenneth L. Smith

The Department of Communication and Journalism provides a broad range of professional and research courses, offering a sound interdisciplinary academic program for students who plan careers in communication or media. Courses are comprised of writing, speaking and analyzing messages; forms of interpersonal communication; media effects and audiences' interpretations of media messages and images. Degrees are granted in communication and journalism with academic specialties in each of the degree areas. Students are given academic preparation in communication skills (media writing and public speaking), coupled with opportunities for professional experience in their majors. The department also offers minors in public relations, communication, journalism, and marketing communication.

Marketing, Facilities and Research Activities

The department encourages majors to work actively in professional opportunities. The department offers unique experience for students with the student newspaper, *The Branding Iron*.

Oral Communication Center, Ross Hall

442. A resource for the entire university community. The lab is open for anyone required to present material orally. Lab instructors offer assistance at any stage in the process—from topic selection, purpose statements and gathering materials—to organizing, outlining and rehearsal. They can help alleviate speech anxiety that may prevent or inhibit some individuals from achieving their overall academic or career

goals. Clients can have their presentations recorded for critical input and evaluation as well as for portfolio or interview applications.

Debate. The department conducts a nationally recognized program of Cross Examination Debate Association (CEDA). Teams and individuals representing the university attend national intercollegiate tournaments each year. Participation in the forensics program is open to all University of Wyoming students on a credit (COJO 2099) or non-credit basis.

Laboratories. The department has computer and research laboratories that support the professional, academic and research programs. These include a computer lab and digital production equipment.

Research. The department encourages undergraduate and graduate research. Faculty and students participate in research projects in social, cultural and political aspects related to media, interpersonal and organizational processes.

Internships. Journalism majors are required to complete internships in their field. Communication majors are encouraged to complete internships in their field. In addition to working with the *Branding Iron*, students complete internships with state, regional, and national weekly and daily newspapers; advertising and public relations agencies; non-profit organizations; businesses, professional and university sports organizations; governmental agencies; and many others. *Note:* a maximum of 6 hours in COJO 3480 and 4990 count as fulfillment of the requirements for a major. Up to 12 hours will count toward graduation as upper-division hours.

Student Organizations

Professional Organizations. The department has a chapter of Lambda Pi Eta, communication honorary.

Student Activity. Within the department, student representatives participate on faculty committees where they assist in forming policies of the department.

The Branding Iron. The daily campus newspaper is independently managed by students at UW. It provides professional experiences for reporting, editorial, photojournalism, publication design and advertising.

The Owen Wister Review. The literary and arts magazine is independently managed and produced by university students, it features poetry, short stories, essays, photography and artwork.

Frontiers Magazine. The magazine is independently managed by UW students. Containing general interest content, the publication offers students opportunities to improve their professional skills in feature writing, in-depth reporting, photography, layout, design, advertising and marketing. Like the *Branding Iron* and *Owen Wister Review*, *Frontiers* is published under the auspices of UW Student Publications.

Scholarships and Awards

The department has several scholarships available to qualified students. Check the Communication and Journalism website or UW Scholarships and Student Financial Aid for additional information.

Undergraduate Programs

The department offers courses leading to baccalaureate degrees in communication and journalism.

Students majoring in the department are required to earn a grade of C or better in departmental required courses. Students may not take a course for S/U credit to satisfy requirements of the major.

Departmental Core Courses

In addition to the university studies requirements listed in this *Catalog*, all students majoring in communication and journalism must take the following required courses:

Required Courses	Hrs.
COJO 1000 Intro to Mass Media	3
COJO 2010 Public Speaking	3
COJO 2100 Media Writing	3
STAT 2070 Intro to Statistics for the Social Sciences	4
(This course is a prerequisite for COJO 3070)	
COJO 3070 Communication Research.....	3
Language 1010	4
Language 1020	4

College of Arts and Sciences Requirements	Hrs.
A&S U.S. Diversity (ASD).....	3
A&S Global Awareness (ASG)	3

Communication Major

Communication is a liberal arts degree relevant to a variety of careers in community relations, public relations, politics, administration, law, sales management and many other fields.

Bachelor of Arts in Communication

Required Courses	Hrs.
Departmental core courses.....	30
COJO 1040 Intro to Human Comm.....	3
COJO 3010 Business/Prof Comm	3
COJO 3040 Advanced Comm Thry	3
Electives	15
(At least 12 elective hours must be at the 3000-level or higher)	

Additional Program Requirements	Hrs.
Human Culture (H)	6

Bachelor of Science in Communication

Required Courses	Hrs.
Departmental core courses.....	30
COJO 1040 Intro to Human Comm.....	3
COJO 3010 Business/Prof Comm	3
COJO 3040 Advanced Comm Thry	3
Electives	15
(At least 12 elective hours must be at the 3000-level or higher)	

Additional Program Requirements	Hrs.
Physical and Natural World (PN) or Quantitative Reasoning (Q)	6-8

Journalism Major

The journalism major is designed to prepare students for careers as reporters, editors and writers with urban newspapers, community newspapers, news services, magazines, public information, public relations, advertising, and many other fields.

Bachelor of Arts in Journalism

Required Courses	Hrs.
Departmental core courses.....	30
COJO 3530 Multimedia Production	3
COJO 4500 Mass Communication Law.....	3
COJO 3480 Internship	3
Departmental electives.....	15
(Includes 9 elective hours at the 3000-level or higher in journalism, plus 3 elective hours at the 3000-level or higher)	

Additional Program Requirements	Hrs.
Human Culture (H)	6

Bachelor of Science in Journalism

Required Courses	Hrs.
Departmental core courses.....	30
COJO 3530 Multimedia Production	3
COJO 4500 Mass Communication Law.....	3
COJO 3480 Internship	3
Departmental electives.....	15
(Includes 9 elective hours at the 3000-level or higher in journalism, plus 3 elective hours at the 3000-level or higher)	

Additional Program Requirements Hrs.
Physical and Natural World (PN) or
Quantitative Reasoning (Q)6-8

Suggested Specialty Areas in Journalism

Reporting & Editing Hrs.
COJO 3100 Public Affairs Reporting.....3
COJO 4100 Investigative Reporting.....3
COJO 4110 Feature Writing Seminar3

Advertising & Public Relations Hrs.
COJO 3300 Advertising in the Media3
COJO 3310 Public Relations3
COJO 4310 Public Relations Techniques.....3

Media & Society
COJO 3000 History of American
Journalism3
COJO 3520 Communication Technology &
Society3
COJO 3550 Political Communication3
COJO 4020 Mass Media & Society.....3
COJO 4230 Special Topics in Mass Media ...3
COJO 4233 Race, Gender, Ethnicity in the
Media3

Visual & Multimedia
COJO 2400 Introduction to Photography....3
COJO 3200 Graphics of Communication3
COJO 4200 Visual Communication3
COJO 4400 Photojournalism.....3
COJO 4530 Web Design3

Minors

The department offers minors in communication, journalism, marketing communication, and public relations. All minors must have a 2.000 minimum in minor classes. If a student is a communication or journalism major, only six credits can double count for the major and the minor.

The marketing communication minor is designed for College of Business and communication and journalism majors. Other majors are not recommended for this minor. For questions regarding this, please contact the minor supervisor.

Communication Minor (18 hours)

Required: (12 hours)
COJO 1040 Intro to Human
Communication Theory
COJO 2010 Public Speaking
COJO 3010 Business and Professional
Communication
COJO 3040 Advanced
Communication Theory

Electives: (6 hours)
COJO 3160 Theory of Language and Society
COJO 3190 Cross Cultural Communication
COJO 3480 Internship (limited to 3 credits)

COJO 3520 Communication,
Technology & Society
COJO 3550 Political Communication
COJO 3900 Family Communication
COJO 4020 Mass Media & Society
COJO 4030 Advanced Interpersonal
Communication
COJO 4050 Communication & Conflict
COJO 4061 Rhetorical Theory & Criticism
COJO 4140 Nonverbal
Communication Studies
COJO 4250 Advanced Organizational
Communication
COJO 4260 Rhetoric and Social Justice
COJO 4620 Intergroup Communication
COJO 4640 Communication
Apprehension & Competence
COJO 4210 Special Topics in
Communication (no more than one)

Journalism Minor (18 hours)

Required courses: (9 hours)
COJO 1000 Intro to Mass Media
COJO 2100 Media Writing
COJO 4500 Mass Communication Law
Elective courses: (9 hours)
COJO 2400 Intro to Photography
COJO 3000 History of American Journalism
COJO 3100 Public Affairs Reporting
COJO 3200 Graphics of Communication
COJO 3480 Internship (limited to 3 credits)
COJO 3530 Multimedia Production
COJO 3550 Political Communication
COJO 4020 Mass Media & Society
COJO 4040 Digital Video Editing
COJO 4200 Visual Communication
COJO 4230 Special Topics in Mass
Media (no more than one)
COJO 4233 Race, Gender,
Ethnicity in the Media
COJO 4400 Photojournalism
(COJO 2400 prerequisite)
COJO 4530 Web Design

Marketing Communication Minor (21 hours)

Required for all minors:
MKT 3210 Introduction to Marketing
MGT 3210 Management & Organization
COJO 3300 Advertising in the Media
COJO 3310 Public Relations
**COJO Emphasis (to be taken
by non-COJO majors):**
Choose three courses from the
following: (9 hours)
COJO 2100 Media Writing (Required
in this emphasis and prerequisite
to COJO 3300 and COJO 3310)
COJO 2400 Intro to Photography
COJO 3200 Graphics of Communication
COJO 3480 Section 1 (Prerequisite
9 hours of COJO)

COJO 3530 Multimedia Production
COJO 4040 Digital Video Production
(Prerequisite 9 hours of COJO)
COJO 4310 Public Relations Techniques
(Prerequisite COJO 3310)

Marketing Emphasis (to be taken by non-College of Business majors):

Choose three courses from the
following: (9 hours)
MKT 4240 Consumer Behavior
(Required in this emphasis)
MKT 4230 Integrated Marketing
Communications
MKT 4520 Marketing Research & Analysis
MKT 4540 International Marketing
MKT 4590 Sustainable Business Practices
MKT 4910 Special Topics in Marketing
SELL 3310 Professional & Technical Selling

Public Relations Minor (21 hours)

Required: (12 hours)
COJO 1000 Intro to Mass Media
COJO 2100 Media Writing
COJO 3310 Public Relations
COJO 4310 Public Relations Techniques
Plus three of the following: (9 hours)
COJO 2400 Intro to Photography
COJO 3010 Business & Professional
Communication
COJO 3300 Advertising in the Media
COJO 3480 Internship (limited to 3 credits)
COJO 3530 Multimedia Production
COJO 4040 Digital Video Production
COJO 4200 Visual Communication
COJO 4230 Special Topics in Mass
Media (no more than one)
COJO 4250 Advanced Organizational
Communication
COJO 4530 Web Design

Graduate Study

The Department of Communication and Journalism offers graduate work leading to the master of arts degree in communication (either thesis or non-thesis) with emphasis on human communication or media communication.

The program offers coursework and study in rhetorical, critical/cultural, and social scientific perspectives and methodologies. The program is designed to be flexible such that students can examine questions that relate to their specific interests in human communication and/or mediated communication. Areas of interest include but are not limited to 1) communication processes in media (e.g., journalism, social media, advertising, public relations) about various issues such as politics, race and ethnicity, science, health, law and eth-

ics, and international relations; 2) communication processes in human relationships (e.g., in interpersonal, small group, and organizational settings) about various issues such as culture, diversity, education, technology, science, and politics; and 3) communication as an agent of stability and change in diverse social systems.

Program Specific Admission Requirements

A cumulative minimum grade point average of 3.000 (A=4.000) on previous coursework is required for full admission.

The GRE is not required for admission to the graduate program. However, anyone who wants to be considered for a graduate assistantship in the department must take the GRE.

For international graduate students, the minimum acceptable TOEFL score is 540 (76 iBT). The minimum acceptable IELTS score is 6.5. International students must also provide proof of financial support (see UW Admissions for more details).

All graduate student applications, both domestic and international, must provide a writing sample of their work, whether that is a research paper, media publication, or another example of scholarly work. Please contact the director of graduate studies with any questions about the writing sample.

Program Specific Degree Requirements

Administered by the Director of Graduate Studies, the programs are structured to facilitate completion of requirements for the M.A. degree in two years. Deficiency makeups may be required.

Master of Arts research thesis

31 hour program.

Students must complete an accepted research thesis approved by the student's thesis committee.

Students must complete a minimum of 27 credit hours and 4 hours of thesis credit. A minimum of 24 hours must be within the department, with a maximum of 6 hours of independent study, 3 hours of internship credit hours, and 3 hours of 4000-level coursework.

Students must complete COJO 5070, 5080, and 5800, as well as one of the following theory courses: COJO 5061, 5310, or 5540.

Master of Arts professional project

33 hour program.

Students must complete an accepted professional project (e.g., documentary film, public relations and marketing plan, website) approved by the student's graduate committee. Students who chose the project option will be required to take 30 credit hours plus 3 hours of Graduate Project credits (for a total of 33 credit hours). A minimum of 27 hours must be taken within the department, with a maximum of 6 hours of independent study, 3 hours of internship credit hours, and 6 hours of 4000-level coursework.

Students must complete COJO 5070, 5080, and 5800, as well as one of the following theory courses: COJO 5061, 5310, or 5540.

Communication and Journalism (COJO)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1000. Introduction to Mass Media. 3. [CS◀▶H] An overview of mass media, newspapers, magazines, books, radio, television and films. Studies mass media's historical development, emphasizing understanding techniques of expression and impact on American culture. Surveys content of mass media; considers contemporary problems and trends.

1030. Interpersonal Communication. 3. [(none)◀▶H] Focuses on interpersonal communication settings or face-to-face interaction. Basic unit of study is, therefore, the dyad. Also includes some work in small group settings.

1040. Introduction to Human Communication. 3. [CS◀▶H] Introduces theories and research of social and behavioral scientists on communication process. Orients beginning communication students by focusing on concepts and issues central to human communication.

1101. First-Year Seminar. 3. [(none)◀▶FYS]
2010 [1010]. Public Speaking. 3. [O◀▶COM2] Beginning public speaking course. Students will develop foundational oral, digital and writing communication skills. Emphasizes message construction, performance and critique in public communication settings. Includes speech preparation, listening, audience analysis, writing strategies, digital communication, critical thinking, language/nonverbal behavior and various speaking formats. *Prerequisite:* Successful completion of a COM1 course.

2095 [2090]. Persuasive Argumentation. 3. [(none)◀▶COM2] Develops student competencies in persuasive argument in its written, oral, and digital dimensions. Students

participate in a series of debate exercises that draw upon digital research, written speech and message composition, and extemporaneous oral speaking. The ethics of persuasion and critical research literacy in a digital environment are also featured. *Prerequisite:* Successful completion of a COM1 course.

2099 [2060]. Special Topics in Debate. 1-3 (Max. 12). Explores the argumentative and rhetorical facets of the annual intercollegiate policy debate topic. Participation on the University's debate team is required for enrollment. *Prerequisite:* Instructor permission required.

2100. Media Writing. 3. [WB◀▶(none)] This course focuses on an introduction to basic news writing, reporting, editing, interviewing, PR and advertising. Strong writing, deadlines, accuracy, news judgment, ethical practices and sensitivity of our pluralistic society are expected. This course provides skills necessary for various media careers including media writing, PR, marketing and magazine writing. *Prerequisite:* WA or COM1 writing course.

2400. Introduction to Photography. 3. [CA◀▶(none)] Basic course in still photography. Includes classroom demonstrations in techniques of camera use, composition, computer software, and use of photographs, especially for communication and journalism applications.

3000. History of American Journalism. 3. Presents history and development of American journalism from colonial times to present, emphasizing 20th century. *Prerequisite:* COJO 1000.

3010. Business and Professional Communication. 3. [(none)◀▶COM3] Studies theories and techniques of professional communication activities including interviewing skills, group processes, and professional presentations; for students who are beyond elementary oral communication level. Students develop oral communication skills through projects and presentations. *Prerequisite:* COJO 1010 or COJO 2010 and junior standing.

3040. Advanced Communication Theory. 3. Considers nature of human communication theories. Analyzes problems in developing communication theory based on current social science methods. *Prerequisites:* COJO 1000 and COJO 1040.

3070. Communication Research. 3. Focuses on problems in communication and mass communication research. Specifically studies and applies language of science, basic concepts of communication, mass communication research, types and limitations of empirical

research, as well as measurement procedures and analysis. *Prerequisites:* COJO 1000 or 1040 and STAT 2050 or 2070.

3100. Public Affairs Reporting. 3. Practices in public affairs reporting, emphasizing local and state political organization as foundation for such reporting. Specialized reporting fields. News analysis. *Prerequisite:* COJO 2100.

3160. Theory of Language and Society. 3. [WC♦(none)] Considers contributions to communication theory from linguistics, sociolinguistics, sociology, social psychology and anthropology to understanding a spoken language. *Prerequisites:* COJO 1040 and 6 additional hours in the department.

3190. Cross-Cultural Communication. 3. [D♦COM3] Studies human communication processes within the context of various cultures and subcultures. Opportunity for field study of the effect of culture on communication behavior. *Prerequisites:* COJO 1040 and junior standing.

3195. Cultural Encounters in China. 3. [(none)♦H] This course is designed to study the relationship between cultures and communication through a 3-week stay in China. We will explore how cultures and communication interact, interrelate, and influence each other as well as investigating how and why cross-cultural communication is filled with both challenges and opportunities through our daily interactions with Chinese people. *Prerequisite:* COJO 1040.

3200. Graphics of Communication. 3. [CA♦(none)] Combines editing and design. Studies evaluation, selection and editing of magazine and newspaper news copy. Practice in publication design, including headline writing, printing methods, page layout and other display techniques. *Prerequisite:* COJO 1000.

3300. Advertising in the Media. 3. Studies fundamentals of copywriting in mediated communication. Provides information about the psychology of advertising, advertising appeals, strategy, and structure of ads and other marketing materials. Includes exercises in basic principles of copywriting for print, electronic and digital media. *Prerequisite:* COJO 2100.

3310. Public Relations. 3. Studies how organizations can improve their relationships with their publics. Explores public opinion and how to research audiences. Explains different skills needed in the field, including its relationship to advertising and marketing. *Prerequisite:* COJO 2100.

3480. Internship. 1-12 (Max. 12). Review and evaluation of approved internship experience. At the conclusion, students must submit a journal containing work samples and a critique of

their performance and internship experience. Maximum of 6 hours of internship credit can be used to fulfill requirements of the major. *Prerequisites:* signed contract and 9 hours in the department.

3520. Communication Technology and Society. 3. Studies role of communication technology in functioning of society. Examines history of effects on personal growth, self-concept, world view, creative thinking, personal relationships and social processes. *Prerequisite:* COJO 1000 or 1040.

3530. Multimedia Production. 3. Intensive introduction to reporting, writing, producing, editing, and managing content for the web. Integration of writing, photography, social media, audio, video, and blogging for both journalism and strategic communication (e.g., public relations, marketing). Focus on grammar, AP style, deadlines, accuracy, news judgment, ethics, and appreciation of our diverse society. *Prerequisite:* COJO 2100.

3550. Political Communication. 3. Examines the intersection of politics and communication. For example, may cover politics and media, interpersonal political discussion, organizational and governmental political communication, political campaigns, politics and technology, etc. Moreover, it may cover the effects of political communication on individuals' opinions and behavior. Cross listed with POLS 3550. *Prerequisites:* COJO 1000, COJO 1040, or POLS 1000.

3900. Family Communication. 3. This course will assist students in a study of the concept of family from a communication perspective. The goals of the course include: 1. To introduce students to the wide range of family experiences in the 21st century; 2. To develop knowledge regarding the major communication theories used to analyze families and their interaction; 3. To allow students the opportunity to analyze your own family situations, and those of your classmates, in order to benefit you both academically and personally, to provide new insights into the people with whom you share your lives as well as others who live in your communities. Restricted to juniors and seniors. *Prerequisite:* COJO 1040.

4020. Mass Media and Society. 3. Studies ethical and related problems of mass communication from contemporary and historical viewpoints. Critical analysis of the performance of the mass media. *Prerequisites:* COJO 1000 or 1040 and 6 hours in the department.

4030. Advanced Interpersonal Communication. 3. Studies research and theory in interpersonal relationships; formation and

maintenance of friendships; marriages; and group relationships. *Prerequisites:* COJO 1040 and 6 hours in the department.

4040. Digital Video Production. 3. This course teaches technical skills and creative principles involved in shooting and editing single camera video. Topics include video technology, design, lighting, audio, continuity, and editing. Students will gain experience planning, shooting, and editing video projects through hands-on exercises and assignments. Dual listed with COJO 5040. *Prerequisite:* 9 hours of COJO coursework.

4050. Communication and Conflict. 3. Studies research and theory concerning communication in conflict development and management. Examines forms of conflict, including occurrences in interpersonal, group, organizational and cultural contexts. *Prerequisites:* COJO 1000 or 1040 and 6 hours in the department.

4061. Rhetorical Theory and Criticism. 3. An investigation into how rhetorical theory, spanning from its ancient roots in Aristotelian thinking to its current postmodern components, operates in society. Explores how various critical methods can be utilized to gain a stronger understanding of public communication texts, including newspapers, speeches, music and film. Cross listed with ENGL 4061; dual listed with COJO 5061. *Prerequisites:* COJO 1040 and junior standing.

4100. Investigative Reporting. 3. [WC♦(none)] Practices developing and writing articles of depth and substance in areas of public concern. Emphasizes careful research, weighing conflicting viewpoints, interpreting complex issues and critical evaluation. *Prerequisite:* COJO 2100.

4110. Feature Writing Seminar. 3. [WC♦COM3] This course critically examines how to produce content for a magazine and how to write feature stories. Among the topics covered are how to develop a good idea, analyze a target audience, gather information using interviews and research, write a feature article, edit your writing, and market a feature story. *Prerequisite:* COJO 2100.

4120. News Editing. 3. Students develop skills in editing copy for newspapers and magazines. Focus is on copy editing for grammar, syntax, style, clarity, spelling, word usage, fairness and balance, conciseness, and accuracy. Students also learn to write effective headlines and cutlines, do effective design and layout of tabloid and broadcast pages, and create effective information graphics and photo features. *Prerequisite:* COJO 2100.

4140. Nonverbal Communication Studies.

3. Critical analysis of current studies in the area of nonverbal communication. Students are required to complete an independent study of some aspect of nonverbal communication relevant to interests. Dual listed with COJO 5140. *Prerequisites:* junior standing.

4160. African American Rhetoric. 3.

[CH,D◀COM3] African American discourse and its relationship to equality and participation. Through examination of various media, music, speeches, and art this course uses the struggle of African Americans as an instructive exemplar, to come to terms with the philosophical concepts, political issues, moral complexities, and discursive characteristics of African American Rhetoric. Dual listed with COJO 5160; cross listed with AAST 4160. *Prerequisites:* 9 credit hours in AAST or COJO.

4200. Visual Communication. 3.

The purpose of this course is to combine visual communication theory and application in order to enhance visual literacy and practical skills. Content includes analyzing visual messages, developing and producing visual messages, and understanding how audiences process and are affected by visual messages. Dual listed with COJO 5200. *Prerequisite:* 9 hours of COJO coursework.

4210. Special Topics in Communication.

1-3 (Max. 6). Intensive study of such special problems and topics in human communication processes as gender relations, power dynamics, family and political communication. Content varies. Dual listed with COJO 5210. *Prerequisites:* COJO 1040 and 9 hours in the department.

4230 [4910]. Special Topics in Mass Media.

1-3 (Max. 6). Intensive study of problems and topics specific to the mass media, including print, broadcast, advertising, public relations, and the Internet. Course content varies and may include historical, legal, ethical, political, sociocultural, economic, and theoretical perspectives. Dual listed with COJO 5230. *Prerequisites:* COJO 1000 and 9 hours in the department.

4233. Race, Gender, Ethnicity in the Media. 3. [WC,D◀COM3]

Examine the role mass media plays in the Black community and other racial, ethnic, gendered, and socioeconomic communities. Students will develop a critical understanding of the way the mass media uses stereotypes and prejudice to influence society's views about ethnic minorities and women in contemporary United States society. Cross-listed with AAST 4233 and WMST 4233; dual-listed with COJO 5233. *Prerequisites:* 3 credit hours in AAST, COJO, or WMST, WB/COM2, and junior standing.

4250. Advanced Organizational Communication. 3.

Studies communication processes in political, educational, industrial, medical and nonprofit organizations. Emphasizes in-depth analysis of theories and methods of organizational research and practice.

4260. [4985] Rhetoric and Social Justice. 3.

[D◀COM3] Analyzes concepts of ableism, anti-Semitism, heterosexism, racism, sexism, and socioeconomic class through a critical/social construction framework. It attempts to develop a "working" definition of these concepts by analyzing historical and current conceptualizations and identifying marginalization and disenfranchisement as it is woven in the fabric of American society. Dual listed with COJO 4260; cross listed with AAST 4260. *Prerequisites:* Minimum of 9 credit hours in AAST or COJO and junior standing.

4310. Public Relations Techniques. 3.

Practical application of public relations writing, planning and program implementation. Includes exercises in writing news releases, structuring news conferences and writing preliminary and formal public relations strategies. The plans also incorporate advertising and marketing segments for external publics, newsletter design, editing and interpersonal relations. *Prerequisite:* COJO 3310.

4400. Photojournalism. 3.

Studies and intensively practices reporting news and features photographically, plus essentials of advertising photography. Includes advanced camera and darkroom techniques and photo editing. Two one-hour lectures and one two-hour laboratory weekly. *Prerequisite:* COJO 2400.

4500. Mass Communication Law. 3.

Studies development of First Amendment law. Includes practical application of law to mass media practice; relationship of legal and social responsibilities of the mass media; and problems of law and regulation, such as constitutional, statutory and administrative. *Prerequisite:* COM2 with a grade of C or better.

4530. Web Design. 3.

Addresses the theory and logistics of web design and online interactivity. Students will create and maintain a professional portfolio website that showcases their communication and design talents. It is applicable to journalism, public relations, advertising, marketing, photography, and any other media-related career path that uses new media. Dual listed with COJO 5530. *Prerequisites:* COJO 1000 and 9 hours in the department.

4600. Mass Media Ethics. 3. Studies ethical theory, emphasizing how it can be applied to problem solving in the media. Examines major ethical perspectives and requires application

to actual case studies. Dual listed with COJO 5600. *Prerequisite:* 6 hours at 3000-level in the department.

4620. Intergroup Communication. 3.

The course will provide an overview of theory and research on intergroup relations to demonstrate how communication both affects and reflects our social group memberships. The objective is to provide students with the theoretical foundation to view various contexts of communication through an "intergroup lens." Dual listed with COJO 5620. *Prerequisite:* COJO 1000 or COJO 1400.

4640. Communication Apprehension/Competence. 3.

This course examines theoretical explanations, research findings, and interventions. Students are required to develop research projects aimed at helping people cope with communication fear or anxiety in various contexts. Dual listed with COJO 5640. *Prerequisite:* COJO 1000 or 1040.

4700. Media, Science, and Society. 3.

This course discusses why scientific, health, and environmental issues are covered in particular ways in media. We will also examine how these messages impact people's attitudes, opinion, knowledge, and emotions about science, health, and the environment. Dual listed with COJO 5700; cross listed with ENR 4700. *Prerequisites:* COJO 1000 or ENR 1200 or ENR 1500 or ENR 2000.

4990. Independent Study in Communication. 1-3 (Max. 6).

Prerequisites: 15 hours in the department and consent of department chair.

5010. Texts of Mass Media. 3.

Intensive critical examination of the history, theory, social responsibility and empirical research in the production and consumption of mediated messages. *Prerequisite:* graduate standing.

5030. Seminar in Interpersonal Communication. 3.

Intensive examination of contemporary theoretical perspectives and empirical research on interpersonal communication, including the role of communication in self-concept formation, social relationship development, and the structure and function of ordinary discourse in human interaction. Dual listed with COJO 4030. *Prerequisite:* graduate standing.

5040. Digital Video Production. 3.

This course teaches technical skills and creative principles involved in shooting and editing single camera video. Topics include video technology, design, lighting, audio, continuity, and editing. Students will gain experience planning, shooting, and editing video projects through hands-on exercises and assignments. Dual listed with COJO 4040. *Prerequisite:* graduate standing.

5061. Rhetorical Theory and Criticism. 3. An investigation into how rhetorical theory, spanning from its ancient roots in Aristotelian thinking to its current postmodern components, operates in society. Explores how various critical methods can be utilized to gain a stronger understanding of public communication texts, including newspapers, speeches, music and film. Cross listed with ENGL 5061; dual listed with COJO 4061. *Prerequisite:* graduate status or 12 hours of 3000–4000 level work.

5070. Quantitative Research Methods. 3. Design, implementation, and examination of research questions in communication with quantitative, social scientific methodologies. Attention primarily on survey design, experimental design, and quantitative content analysis. Analysis of quantitative data with statistical programs. Theories and ethical issues with quantitative research. Design and implement a quantitative study start to finish. *Prerequisite:* graduate standing.

5080. Qualitative Research Methods. 3. Students study principles and issues associated with qualitative methods used in communication and media research. The class explores methods that use interpersonal communication and observation as tools for data collection and explores methods that analyze media content from a critical and qualitative perspective. *Prerequisite:* graduate standing.

5140. Nonverbal Communication Studies. 3. Critical analysis of current studies in the areas of nonverbal communication. Students are required to complete an independent study of some aspects of nonverbal communication relevant to interests. Dual listed with COJO 4140. *Prerequisites:* COJO 1040 or COJO 1000.

5160. African American Rhetoric. 3. African American discourse and its relationship to equality and participation. Through examination of various media, music, speeches, and art this course uses the struggle of African Americans as an instructive exemplar, to come to terms with the philosophical concepts, political issues, moral complexities, and discursive characteristics of African American Rhetoric. Dual listed with COJO 4160; cross listed with AAST 5160. *Prerequisites:* 9 credit hours in AAST or COJO.

5200. Visual Communication. 3. The purpose of this course is to combine visual communication theory and application in order to enhance visual literacy and practical skills. Content includes analyzing visual messages, developing and producing visual messages, and understanding how audiences process and are affected by visual messages. Dual listed with COJO 4200. *Prerequisite:* graduate standing.

5210. Special Topics in Communication. 1-3 (Max. 6). Intensive examination of current theoretical issues in communication. Course content varies. Graduate students are expected to follow a rigorous reading schedule and submit a major paper or research project. Dual listed with COJO 4210. *Prerequisite:* graduate standing.

5230. Special Topics in Mass Media. 1-3 (Max. 6). Intensive study of problems and topics specific to the mass media, including print, broadcast, advertising, public relations and the internet. Course content varies and may include historical, legal, ethical, political, sociocultural, economic and theoretical perspectives. May dual list with COJO 4230. Graduate students are expected to follow a rigorous reading schedule and submit a major paper or research project. *Prerequisite:* graduate standing.

5233. Race, Gender, Ethnicity in the Media. 3. Examine the role mass media plays in the Black community and other racial, ethnic, gendered, and socioeconomic communities. Students will develop a critical understanding of the way the mass media uses stereotypes and prejudice to influence society's views about ethnic minorities and women in contemporary United States society. Cross-listed with AAST 5233 and WMST 5233; dual-listed with COJO 4233. *Prerequisites:* 3 credit hours in AAST, COJO, or WMST, WB/COM2, and junior standing.

5250. Seminar In Organizational Communication. 3. Intensive examination of the historical and contemporary theoretical approaches and empirical research in organizational dynamics. Attention primarily focuses on how the institutionalized collective affects and is affected by other social systems. Dual listed with COJO 4250. *Prerequisite:* graduate standing.

5260. [5985] Rhetoric and Social Justice. 3. Analyzes concepts of ableism, anti-Semitism, heterosexism, racism, sexism, and socioeconomic class through a critical/social construction framework. Attempts to develop a “working” definition of these concepts by analyzing historical and current conceptualizations and identifying marginalization and disenfranchisement as it is woven in the fabric of American society. Dual listed with COJO 4260; cross listed with AAST 5260. *Prerequisite:* graduate standing.

5310. Seminar in Mass Communications. 3. The study of contemporary, historical, critical and behavioral theories of mass communication processes. Attention primarily on the social functions performed by mediated messages. *Prerequisite:* graduate standing.

5530. Web Design. 3. Addresses the theory and logistics of web design and online interactivity. Students will create and maintain a professional portfolio website that showcases their communication and design talents. It is applicable to journalism, public relations, advertising, marketing, photography, and any other media-related career path that uses new media. Dual listed with COJO 4530. *Prerequisites:* COJO 1000 and 9 hours in the department.

5540. Seminar in Communication Theory. 3. An intensive examination of various metatheoretical assumptions and theoretical models used in the study of communicative dynamics. *Prerequisite:* graduate standing.

5600. Mass Media Ethics. 3. The study of ethical theory with special emphasis on how that theory can be applied to problem solving in the media. Examines major ethical perspectives and requires the application of those perspectives to actual case studies. Graduate students are expected to follow a rigorous project. Dual listed with COJO 4600. *Prerequisite:* graduate standing.

5620. Intergroup Communication. 3. The course will provide an overview of theory and research on intergroup relations to demonstrate how communication both affects and reflects our social group memberships. The objective is to provide students with the theoretical foundation to view various contexts of communication through an “intergroup lens.” Dual listed with COJO 4620. *Prerequisite:* graduate standing.

5640. Communication Apprehension/Competence. 3. This course examines theoretical explanations, research findings, and interventions. Students are required to develop research projects aimed at helping people cope with communication fear or anxiety in various contexts. Dual listed with COJO 4640. *Prerequisite:* graduate standing.

5700. Media, Science, and Society. 3. This course discusses why scientific, health, and environmental issues are covered in particular ways in media. We will also examine how these messages impact people's attitudes, opinion, knowledge, and emotions about science, health, and the environment. Dual listed with COJO 4700; cross listed with ENR 5700. *Prerequisite:* graduate standing.

5800. Foundations of Communication and Journalism. 3. Examines current issues and trends in the various areas of communication and journalism that are represented within the department. Students analyze the historical roots of these issues and trends as a way of understanding the present context and future evolution of communication and journalism

scholarship. *Prerequisites:* first year of graduate study and acceptance into the COJO graduate program.

5890. Problems: Communication. 1-4 (Max. 6). *Prerequisite:* 18 hours at the 5000 level in the department.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5961. Graduate Projects. 1-4 (Max. 4). Limited to those students enrolled in a Plan B graduate program. Students should be involved in non-course scholarly activities in support of their Plan B project. *Prerequisites:* enrollment in Plan B program and departmental approval.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

Department of Criminal Justice and Sociology

Criminal Justice

208 Arts and Sciences Building,
(307) 766-2988

Web site: www.uwyo.edu/cj

Department Head: Eric Wodahl

Professor:

ADRIENNE FRENG, B.A. Black Hills State University 1995; M.A. University of Nebraska 1997; Ph.D. 2001; Professor of Criminal Justice 2007, 2001.

Associate Professor:

JAMIE SNYDER, B.S. Northern Kentucky University 2005; M.S. University of Cincinnati 2007; Ph.D. 2011; Associate Professor of Criminal Justice 2018.

ERIC J. WODAHL, A.A. Eastern Wyoming College 1992; B.A. Chadron State College 1994; M.P.A. University of Wyoming 2003; Ph.D. University of Nebraska at Omaha 2007; Associate Professor of Criminal Justice 2012, 2008.

Assistant Professor:

KATELYN GOLLADAY, B.B.A. Pacific Lutheran University 2012; M.S. Arizona State University 2014; Ph.D. 2018; Assistant Professor of Criminal Justice 2018.

LAUREN McLANE, B.S. Radford University 2002; J.D. Seattle University School of Law 2008; Assistant Professor of Law 2018.

KIMBERLY SCHWEITZER, B.S. University of North Dakota 2010; M.S. University of Wyoming 2013; Ph.D. 2016; Assistant Professor of Criminal Justice 2016.

CLAIR WHITE, B.A. Colorado State University 2009; Ph.D. Arizona State University 2015; Assistant Professor of Criminal Justice 2018.

Assistant Lecturer:

DANIEL FETSCO, B.A. University of Wyoming 1995; J.D. University of Denver 1998; M.A. Arizona State University 2013; Assistant Lecturer of Criminal Justice 2017.

Adjunct Professor:

(See Catalog section following name for academic credentials.)

Robert A. Schuhmann, political science

Students majoring in criminal justice will be involved in a critical examination of the sources of criminal behavior and the social and political institutions and processes designed to control criminal behavior. Criminal Justice majors are offered at the University of Wyoming campus in Laramie, as well as through Distance Education.

We expect that our graduating students will have (1) acquired an accurate knowledge base relating to crime in modern society to include the elements of major crime, the extent of crime, and its distribution in society; (2) will possess a broad historical and contemporary understanding of the institutions that make up our criminal justice system, the interconnectedness of these institutions, and the related issues of diversity and discrimination; (3) will have developed an understanding of the major legal principles that serve as the foundation for criminal law and the processing of individuals through the justice system, as well as the difficult situations and ethical dilemmas they will face in the criminal justice field; (4) will understand and apply basic concepts and theoretical perspectives in criminology and

criminal justice; (5) will possess the ability to access, comprehend, and critically examine research and policy relevant to the field of criminal justice and criminology, including understanding basic research methodology.

Undergraduate Major

Students pursuing a B.A. in criminal justice must fulfill university studies and college requirements as listed in this Catalog, satisfy required prerequisites to courses in the major program, and complete a minimum of 40 credit hours in the major. Only courses in which a grade of C or better has been earned may be used to satisfy major requirements.

Foundation Courses:	Hrs.
CRMJ 1001.....	3
CRMJ 2210.....	3
CRMJ/SOC 2400.....	3
CRMJ 2685.....	4
CRMJ 3110.....	3
CRMJ 3350.....	3
CRMJ 3490.....	3
CRMJ 4200.....	3

Crime and Deviance (2 courses)	Hrs.
CRMJ/SOC 3250.....	3
CRMJ/SOC 3400.....	3
CRMJ 3500.....	3
CRMJ 4151.....	3
CRMJ 4260.....	3
CRMJ/INST/SOC 4705.....	3

Criminal Justice Institutions & Processes (2 courses)	Hrs.
CRMJ 4130.....	3
CRMJ 4140.....	3
CRMJ 4150.....	3
CRMJ 4280.....	3
CRMJ 4750.....	max 3
CRMJ 4860.....	3

Supporting Courses

(three credit hour course; or 1 additional course from Crime & Deviance or Criminal Justice Institutions & Processes categories):

	Hrs.
CRMJ/POLS 4110.....	3
CRMJ/ANTH 4230.....	3
CRMJ/SOC 4350.....	3
CRMJ/PSYC 4370.....	3
CRMJ/WMST 4540.....	3
CRMJ/POLS 4600.....	3
CRMJ/PSYC 4730.....	3
CRMJ 4750.....	1-12
CRMJ/PSYC 4760.....	3
CRMJ 4965.....	1-6
CRMJ 4975.....	1-3
CRMJ 4990.....	1-3

In addition to the above required courses, it is required that students take POLS 1000, STAT 2050 or 2070, one lab science, and two semesters of the same foreign language. A grade of C or better must be earned to satisfy these additional requirements. Upper division course work that was completed more than ten years prior to graduation will not meet major requirements.

Pre-Law Concentration

The Department of Criminal Justice offers a Pre-Law Concentration for Criminal Justice majors that consists of courses selected from several departments across the university. These courses were chosen to help prepare students for the challenges of law school and the practice of law. Students electing the Pre-Law Concentration are urged to seek advising early.

Along with the 40 hours of criminal justice degree requirements, an additional 27 credit hours (18 of which must be 3000-level courses or above) must be earned for the Pre-Law Concentration. All coursework must be completed with a grade of C or better to be counted toward the concentration.

Verbal Comprehension and Expression (min. of 3 hours)

COJO 2090 Persuasive Argumentation
COJO 3010 Business and Professional Communication
COJO 3160 Theory of Language and Society
AGEC 4450 Negotiation
HIST 4515 American Legal History

Written Comprehension and Expression (min. of 6 hours)

Any two (2) courses with a USP designation of WC or COM3 may be counted in this area.

Critical Understanding of Human Institutions and Values (min. of 3 hours)

ECON 1020 Principles of Microeconomics
MGT 3110 Business Ethics
PHIL 3120 Ancient Greek Philosophy
PHIL 3250 Global Justice
PHIL/ENGL 3340 Philosophy of Literature (max. 3 hours)
PHIL 3350 History of Moral Philosophy
PHIL 3500 History of Science
POLS/AMST/ENR/GEOG/REWM 4051 Environmental Politics
COJO/AAST 4260 Rhetoric and Social Justice

Creative and Analytical Thinking (min. of 3 hours)

CW 2050 Introduction to Fiction *or*
CW 2060 Introduction to Nonfiction (max. 3 hours) *or*

CW 2080 Introduction to Poetry (max. 3 hours)

PHIL 3140 Philosophy of Science
PHIL 3420 Symbolic Logic
PHIL 3510 Introduction to Epistemology
STAT 4015 Regression Analysis
ENR 4550 Negotiation Analysis

World Cultures and International Institutions (min. of 3 hours)

INBU/INST 1040 Intro to International Business
HIST 1320 World History to 1500
HIST 1330 World History since 1500
POLS 2310 Introduction to International Relations
PHIL 3320 Eastern Thought
ANTH/INST 3420 Anthropology of Global Issues
CRMJ 4280 Comparative Criminal Justice
INST/POLS 4340 International Organizations
INST/SOC 4370 Global Political Economy

Electives (max. 3 courses or 9 hours)

ECON 1000 Global Economic Issues
COJO 1030 Interpersonal Communication
COJO 1040 Intro to Human Communication
MGT 1040 Legal Environment of Business
ANTH 1200 Intro to Cultural Anthropology
CNSL 2200 Intro to Student Leadership
STAT 3050 Statistical Methods - General
POLS 3100 Politics and Judicial Process
COJO 3190 Cross-Cultural Communication
PHIL 3440 Philosophy of the Mind
POLS 4100 Constitutional Law: Institutional Powers
CRMJ/POLS 4110 Constitutional Law: Civil Liberties and Rights
GEOG 4325 Legal Aspects of Planning
ANTH 4350 or INST 4340 Culture Change
CNSL 4520 Fundamentals of Counseling
POLS 4840 Seminar in Public Law

Undergraduate Minors

Criminal Justice Minor

A minor in criminal justice requires 18 semester hours in criminal justice. All courses must be completed with a grade of C or better. The required courses are: CRMJ 1001, CRMJ 2210, CRMJ/SOC 2400, CRMJ 3110, CRMJ 3350, and CRMJ 3490.

Pre-Law Minor

The minor requires 18 hours to be completed from among the following courses. Of these 18 hours, 12 must be upper division (3000 or 4000 level). In addition, 12 of the 18 hours must be outside the student's pri-

mary major, and none of these courses may be credited toward both the minor and the USP requirement. Complete one course from each of the following categories. All coursework must be completed with a grade of C or better to be counted toward the minor.

Language Comprehension & Expression (3 hours)

COJO 1030 Interpersonal Communication
COJO 2090 Persuasive Argumentation
COJO 3010 Business & Professional Communication
COJO 3160 Theory of Language & Society
COJO/ENGL 4061 Rhetorical Theory & Criticism
AGEC 4450 Negotiation
ANTH 4795 Language Change

Written Comprehension & Expression (3 hours)

Any course with a USP designation of C3 may be counted in this area. However, no C3 course may be counted twice toward fulfilling this category and the USP C3 requirement or another category within the prelaw minor.

Critical Understanding of Human Institutions & Values (3 hours)

POLS 2460 Intro to Political Philosophy
MGT 3110 Business Ethics
PHIL 3300 Ethical Theory
PHIL 3350 History of Moral Philosophy
PHIL 3500 History of Science
POLS/AMST/ENR/GEOG/REWM 4051 Environmental Politics
POLS 4090 Anglo-American Jurisprudence
FCSC 4113 Consumer Issues
AAST/COJO 4260 Rhetoric and Social Justice
PHIL 4300 Topics in Ethics
PHIL 4340 Issues in Environmental Ethics

Creative & Analytical Thinking (3 hours)

CW 2050 Intro to Fiction
CW 2060 Intro to Nonfiction
CW 2080 Intro to Poetry
PHIL 2420 Critical Thinking
PHIL 3140 Philosophy of Science
PHIL 3220 Existentialism and Phenomenology
PHIL 3420 Symbolic Logic
PHIL 3440 Philosophy of the Mind
PHIL 3510 Intro to Epistemology
CRMJ/ANTH 4230 Forensic Anthropology
PHIL 4420 Advanced Logic
ENR/AGEC 4550 Negotiation Analysis

World Cultures & International Institutions (3 hours)

HIST 1330 World History since 1500
ANTH 2200 World Culture
PHIL 3250 Global Justice

PHIL 3320 Eastern Thought
 ANTH/INST 3420 Anthropology
 of Global Issues
 INST/SOC 4110 Sociology of
 International Development
 CRMJ 4280 Comparative Criminal Justice
 INST/POLS 4340 International
 Organizations

Law (3 hours)

MGT 1040 Legal Environment of Business
 CRMJ 2210 Criminal Law
 POLS 3100 Politics and the Judicial Process
 CRMJ 3110 Criminal Courts and Processes
 NAIS 3300 Federal Indian Law
 AGECE 3400 Agriculture Law
 POLS 4100 Constitutional Law:
 Institutional Powers
 CRMJ/POLS 4110: Constitutional
 Law: Civil Liberties and Rights
 CRMJ 4140 Criminal Legal Procedure
 GEOG 4325 Legal Aspects of Planning
 MGT 4340 Law for Managers
 MGT 4350 Commercial Law
 MGT 4360 Business Law for Entrepreneurs
 COJO 4500 Mass Communication Law
 HIST 4515 American Legal History
 CRMJ/WMST 4540 Women,
 Crime and the Law
 AGECE 4710 Natural Resource
 Law and Policy
 CRMJ/PSYC 4730 Psychology and Law
 ENR 4750 ENR Law & Policy
 POLS 4840 Seminar in Public Law

Graduate Study

A criminal justice concentration within the master of public administration program is offered by the Criminal Justice program.

Program Specific Admission Requirements

Master of Public Administration Plan B (non-thesis)

Students wishing to enroll in the M.P.A. with criminal justice concentration must first be admitted into the M.P.A. program. See M.P.A. program admission requirements for specific details.

Program Specific Degree Requirements

Master of Public Administration Plan B (non-thesis)

The M.P.A. with criminal justice concentration curriculum consists of 39 credits including: core (7), option-core (2) and criminal justice (4) courses. Students may

complete the degree within two years full-time or approximately three-four years part-time. Courses are offered through distance education, which allows students to complete their degree in their community while working full-time.

Required Core Courses

POLS 5000 Survey of Public Administration
 POLS 5400 Public Personnel Management
 POLS 5410 Administrative Behavior &
 Theory of Organizations
 POLS 5440 Principles & Processes of
 Government Budgeting
 POLS 5510 Public Policy and Program
 Management
 POLS 5684 Empirical Analysis for Public
 Administration
 POLS 5690 Capstone in Public Management

Option-Core Courses

All MPA students are required to choose two courses designated as option core credit, defined as courses relating to more specific focuses on public administration and taught by MPA faculty members.

Criminal Justice Concentration Courses

Required Criminal Justice Concentration Courses

CRMJ 5000 Survey of Criminal Justice
 CRMJ 5100 Public Policy and Crime

Elective Criminal Justice Concentration Courses

(students must select two of the following courses)

CRMJ 5130 Leadership and Management in the Criminal Justice System
 CRMJ 5151 Crime Causation
 CRMJ 5280 Comparative Criminal Justice
 CRMJ 5500 Internship in Criminal Justice*
 CRMJ 5860 Social Inequality, Crime, and Criminal Justice

*Students with little or no administration and/or criminal justice professional experience must enroll in CRMJ 5500 as one of their electives.

Additional Requirements

In addition to graduate coursework, M.P.A. students must complete a series of papers constituting the Plan B project. It is the purpose of POLS 5690, Capstone in Public Management, to be a framework within which students initiate and substantially complete their Plan B projects.

Following the completion of all other requirements, the M.P.A. student is required to pass a comprehensive oral

examination covering the information contained within his/her program of study as well as a defense of the Plan B projects. The oral examination is also conducted within the framework of the POLS 5690 Capstone course.

Students entering the M.P.A. Program are expected to possess basic computer literacy, and to have access to a computer for such purposes as communicating with professors via e-mail, receiving M.P.A. Program memos, conducting research on the Web, retrieving articles from course documents libraries, working on course projects, and for conducting interactive/electronic class discussion.

Students must maintain a graduate GPA of 3.000.

Students must complete the CAPP program in lieu of a program of study.

Criminal Justice (CRMJ)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

1001 [2120]. Introduction to Criminal Justice. 3. Introduces the American criminal justice system. Examines nature of crime and describes historical and philosophical foundations of law enforcement agencies, criminal courts and correctional institutions. Discusses major issues facing the criminal justice system.
2210. Criminal Law. 3. Introduces the fundamental principles of substantive criminal law: the history and philosophy of modern criminal law, the basic dimension of criminality, the elements of major crimes, criminal defenses and the nature of criminal sanctions. *Prerequisite:* CRMJ 1001 and POLS 1000.

2400. Criminology. 3. Generally introduces the nature of crime, statistics on crime, types of criminal behavior and explanations of crime. Cross listed with SOC 2400. *Prerequisite:* SOC 1000.

2685 [3680]. Research Methods in Criminal Justice. 4. Introduces students to fundamental issues associated with the application of scientific methods to criminal justice problems. Students examine research designs involving ethnographic, archival, historical, and quantitative methods and how they relate to criminal justice issues. *Prerequisite:* enrollment limited to criminal justice majors.

3110. Criminal Courts and Processes. 3. Examines the structure, organization and operation of criminal courts and their role in the larger criminal justice system; the process of adjudication of criminal cases from initial charging through post-conviction review; the

constitutional rights of the accused; and the roles of the major courtroom participants. *Prerequisites:* CRMJ 1001, CRMJ 2210, and CRMJ/SOC 2400, or declared Public Law minor.

3250. Juvenile Delinquency. 3. Considers the nature of delinquency, including an analysis of treatment methods and the juvenile justice system. Cross listed with SOC 3250. *Prerequisites:* CRMJ/SOC 2400.

3350. Correctional Theory and Practice. 3. Examines the various components of the correctional complex from both theoretical and practical frameworks. Students are exposed to the abundance of research that informs current correctional practice and will be called upon to critically evaluate this research and its implications for correctional policy and practice. *Prerequisite:* CRMJ 1001, CRMJ 2210, CRMJ/SOC 2400, and CRMJ 2685.

3400. Deviant Behavior. 3. Examines theory and research relevant to understanding deviant behavior in general and specific types of individual and subcultural deviancy. Cross listed with SOC 3400. *Prerequisite:* SOC 1000.

3490. Issues in Policing. 3. Examines the various components of policing from both theoretical and practical frameworks. Students are exposed to the abundance of research that informs current policing practice and will be called upon to critically evaluate this research and its implications for policing policy and practice. *Prerequisites:* CRMJ 1001, CRMJ 2210, CRMJ/SOC 2400, CRMJ 2685.

3500. Drugs and the Criminal Justice System. 3. Focus on drugs and their impact on society. Particular interest is paid to the extent of drug use/abuse in America, and the effects of this problem on the criminal justice system and society as a whole. Strategies for controlling both supply and demand are discussed. *Prerequisites:* CRMJ 1001, CRMJ 2210, and CRMJ/SOC 2400.

4110. Constitutional Law: Civil Liberties and Rights. 3. Encompasses case-study analysis of judicial decisions and policies of the constitutional interpretation of the 1st Amendment (freedom of speech, press, association and religion), privacy rights, the rights of the criminally accused, and civil rights (racial and gender equality). Cross listed with POLS 4110. *Prerequisites:* POLS 1000, POLS 3100 recommended.

4130. Leadership and Management in the Criminal Justice System. 3. There is a clear need for managers and administrators to understand leadership and ethics. This course is designed to provide students with a foundation in the management and leadership discourse

surrounding criminal justice agencies. *Prerequisites:* CRMJ 1001, CRMJ 2210, CRMJ/SOC 2400, and CRMJ 3490.

4140. Criminal Legal Procedure. 3. Examines the constitutional principles that safeguard the rights and liberties of criminal suspects and constrain police during the investigatory stages of the criminal justice process: arrest; search and seizure; interrogation; undercover operations; pretrial identification; and the exclusionary rule. *Prerequisites:* CRMJ 1001, CRMJ 2210, and CRMJ/SOC 2400, or declared Public Law minor.

4150. Community-Based Corrections 3. Designed to provide students with an in-depth look at the community corrections complex. It will examine the history and growth of community corrections, the probation system, methods of post-incarceration supervision, intermediate sanctions, and correctional programming and treatment in the community. *Prerequisites:* CRMJ 1001, CRMJ 2210, CRMJ/SOC 2400, and CRMJ 3350.

4151 [3150]. Crime Causation. 3. Examines the causal mechanisms that produce crime. Theoretical perspectives and empirical research from various disciplines will be evaluated, with particular emphasis placed on social factors that may cause crime. Policy implications of the different perspectives will be discussed. Dual listed with CRMJ 5151. *Prerequisites:* CRMJ 1001, CRMJ 2210, and CRMJ/SOC 2400.

4200 [3200]. Ethics in Administration of Justice. 3. Introduces basic ethical theories, emphasizing how ethical theory can be applied to contemporary problems in law enforcement, corrections and adjudication. Students will be called upon to apply these various ethical frameworks to typical moral dilemmas in criminal justice. *Prerequisites:* CRMJ 3110, CRMJ 3350, and CRMJ 3490.

4230. Forensic Anthropology. 3. Introduces methods and purposes of physical anthropology as applied in human identification for law enforcement agencies. Cross listed with ANTH 4230. *Prerequisite:* ANTH 1100.

4260. Gangs. 3. Considers the nature and the characteristics of gangs and gang members. The theoretical and empirical evidence regarding the phenomenon of gangs is evaluated. Particular emphasis is placed on the social and policy implications of this social problem. *Prerequisites:* CRMJ 1001, CRMJ 2210, CRMJ/SOC 2400, and junior standing.

4280. Comparative Criminal Justice. 3. [WC,G♦(none)] Compares the incidence, trends, control, treatment and prevention of crime across nations using mainstream criminological theories. Examines criminal justice

systems from an international perspective and draws lessons for the American society. Explores forms of international cooperation and difficulties in the control of transnational crimes. Dual listed with CRMJ 5280. *Prerequisites:* CRMJ 1001, CRMJ 2210, CRMJ/SOC 2400, and junior standing.

4350. Sociology of Law. 3. A consideration of sociological concepts such as inequality, stratification, social control and social change in an analysis of the law and legal institutions. Topics include: the role of the police, lawyers, judges, and juries; race, sex, age, and sexuality discrimination and civil rights; free speech, and toxic torts. Cross listed with SOC 4350. *Prerequisites:* 6 hours of sociology/criminal justice, including SOC 1000, and at least junior standing.

4370. Criminal Psychopathology. 3. Provides an overview of current theories and empirical evidence concerning the relationship between psychological disorder and criminal behavior. Examines various clinical syndromes and their role in biological, social and psychological genesis of crime, as well as the concept of criminal responsibility. Cross listed with PSYC 4370. *Prerequisite:* A grade of C or better in 6 hours in psychology.

4540. Women, Crime and the Law. 3. Addresses status of women as offenders and as victims in society and in the criminal justice system. Considers special role of women as professionals in the criminal justice system. Cross listed with WMST 4540. *Prerequisite:* ENGL/WMST 1080, WMST/SOC 3500, or CRMJ/SOC 2400.

4600. Political Violence. 3. Examines causes and consequences of violence both among individuals and among nations. Cross listed with POLS 4600. *Prerequisite:* POLS 1000, or SOC 1000, or POLS 1200, or POLS 1250, or POLS 2310, or permission of instructor. (Normally offered every other year)

4705 [4700]. Global Terrorism. 3. Examines the concept, causes, incidence, types, consequences of, and responses to terrorism. Highlights the distinction between domestic and international terrorism and expands on the latter within the framework of the global environment. Cross listed with INST 4705 and SOC 4705. *Prerequisites:* 9 hours in CRMJ, INST, or SOC coursework.

4730. Psychology and Law. 3. Exposes students to the application of psychological principles to problems in law. Emphasizes the American trial system, correction systems and civil commitment. Cross listed with PSYC 4730. *Prerequisite:* A grade of C or better in 6 hours in psychology.

4750. Internship in Criminal Justice. 1-12 (Max. 12). Integrates practical criminal justice experience with academic knowledge. Students participate in specifically assigned duties and observe broader activities of the sponsoring organization, and reflect upon these experiences through written assignments. *Prerequisite:* junior standing, 2.500 cumulative GPA, completion of at least 6 upper division hours in CRMJ and consent of instructor.

4760. Child Maltreatment. 3. Examines the phenomenon of child abuse and neglect. Includes an overview of attitudes towards and legal definitions of child maltreatment. Explores parental factors, contextual influences and developmental consequences of maltreatment. Relies heavily on current research in child abuse and neglect. Emphasizes policy implications. Cross listed with PSYC 4760. *Prerequisite:* A grade of C or better in 6 hours in psychology.

4860. Social Inequality, Crime, Criminal Justice and the Law. 3. Provides an in-depth look at social inequality and its impact on crime, criminal justice, and the law. Particular emphasis will be given to the individual and interactive effects of race, class, and gender inequality. Critical theoretical perspectives that promote social justice will be the primary analytical focus. Dual listed with CRMJ 5860. *Prerequisites:* CRMJ 1001, CRMJ 2210, CRMJ/SOC 2400 and junior standing.

4965. Research Hours in Criminal Justice. 1-6 (Max. 6). Provides undergraduates with an opportunity to assist in conducting various aspects of research under the supervision of criminal justice faculty. Specific research activities and requirements will be determined in consultation with the sponsoring faculty person. Credit is only available for research corresponding to enrollment in this course. Dual listed with CRMJ 5965. *Prerequisites:* upper division standing and consent of instructor required in advance.

4975. Readings. 1-3 (Max. 6). Special programs of readings in criminal justice related subjects will be outlined to meet needs of individual students. *Prerequisite:* consent of instructor.

4990. Topics: ____ 1-3 (Max. 6). Intended to accommodate various special subjects not offered as regular courses. *Prerequisites:* as listed for housing department's topics course.

5000. Survey of Criminal Justice. 3. Provides an overview of criminal justice theory by providing critical evaluation and discussion of research in the criminal justice field. It will emphasize seminal works and review current research concerning the structure, function, operation, interaction of the criminal justice

system's primary components, and future trends. *Prerequisite:* Admission to the MPA Program or consent of instructor.

5100. Public Policy and Crime. 3. This course is designed to take a multidimensional look at public policy issues related to the prevention and control of crime in the United States. Issues covered include the development, implementation, and evaluation of crime control policy. *Prerequisite:* Admission to the MPA Program or consent of instructor.

5151. Crime Causation. 3. Examines the causal mechanisms that produce crime. Theoretical perspectives and empirical research from various disciplines will be evaluated, with particular emphasis placed on social factors that may cause crime. Policy implications of the different perspectives will be discussed. Dual listed with CRMJ 4151. *Prerequisite:* graduate standing or consent of instructor.

5280. Comparative Criminal Justice. 3. Compares the incidence, trends, control, treatment and prevention of crime across nations using mainstream criminological theories. Examines criminal justice systems from an international perspective and draws lessons for the American society. Explores forms of international cooperation and difficulties in the control of transnational crimes. Dual listed with CRMJ 4280. *Prerequisite:* graduate standing.

5500. Internship in Criminal Justice. 3. Educationally-oriented assignments for work in selected criminal justice agencies, with tutorial types of supervision. Offered Satisfactory/Unsatisfactory only. *Prerequisite:* Admission to the MPA Program or consent of instructor.

5860. Social Inequality, Crime, Criminal Justice and the Law. 3. Provides an in-depth look at social inequality and its impact on crime, criminal justice, and the law. Particular emphasis will be given to the individual and interactive effects of race, class, and gender inequality. Critical theoretical perspectives that promote social justice will be the primary analytical focus. Dual listed with CRMJ 4860. *Prerequisite:* graduate standing or consent of the instructor.

5965. Research Hours in Criminal Justice. 1-6 (Max. 6). Provides students with an opportunity to assist in conducting various aspects of research under the supervision of criminal justice faculty. Specific research activities and requirements will be determined in consultation with the sponsoring faculty person. Credit is only available for research corresponding to enrollment in this course. Dual listed with CRMJ 4965. *Prerequisites:* graduate standing; consent of instructor required in advance.

5975. Graduate Readings. 1-3 (Max. 3). This course provides students the opportunity to engage in an in-depth inquiry into a criminal justice topic through a thorough review of the existing literature under the supervision of a faculty member. *Prerequisite:* graduate standing and consent of instructor.

Sociology

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Department Head: Eric Wodahl

Professors:

MALCOLM D. HOLMES, B.A. University of Texas at El Paso 1974; M.A. 1976; Ph.D. University of Texas at Austin 1982; Professor of Sociology 1999, 1991.

Assistant Professor:

DANIEL AUERBACH, B.S. St. Lawrence University 2008; M.S. North Carolina State University 2012; Ph.D. University of Utah 2020; Assistant Professor of Sociology 2020.

JENNIFER TABLER, B.A. University of California Los Angeles 2010; M.S. University of Utah 2013; Ph.D. 2016; Assistant Professor of Sociology 2018.

Professors Emeriti

David Ashley, Audie Blevins, Gary Hampe, Quee-Young Kim, Richard Machalek

Sociology is the scientific study of group life and the investigation of the social causes and consequences of human behavior. This discipline occupies a central position in the social sciences and covers the full scope of social behaviors from intimate interactions between individuals to relationships among entire societies. Most importantly, sociology invites students to analyze those features of social existence that we are most likely to take for granted. As such, sociological training imparts critical and analytical skills of great value in virtually all aspects of modern life.

Much of the applied knowledge employed in diverse fields such as communications, social work, business management, family life, health care, urban planning, government, education, religion and the administration of justice derives from basic sociological research. Consequently, sociological training provides an excellent background for occupations connected with these fields. In addition, an undergraduate degree in sociology prepares many students for advanced study in law, education, business, public administration, social work, pastoral work, health care and other professions.

The department provides a comprehensive sociology education both for students who elect to terminate their formal education with the B.A. and for those who plan to pursue advanced degrees in sociology or a related social science. Fundamentally, however, the department aspires to prepare students for informed participation in an increasingly complex world.

Undergraduate Major

In addition to University and College requirements, the following are minimum requirements for the undergraduate major in sociology leading to the Bachelor of Arts degree.

Thirty-four credit hours are required to earn a major in sociology. These courses are listed below. This includes 13 hours of required Foundation Courses, 12 hours of Core Courses, and 9 hours of sociology elective courses. Grades of “C” or better must be earned in all 34 hours of coursework in order to be counted toward the major.

Foundation Courses

SOC	1000.....	3
SOC/STAT	2070 or STAT 2050	4
SOC	3180.....	3
SOC	4715.....	3

Total Foundation Hrs 13

Core Courses:

Complete four courses from the following list:

SOC	2350.....	3
SOC	3110	3
SOC	3140.....	3
SOC	3200.....	3
SOC/CRMJ	3400	3
SOC	3500.....	3
SOC	3550.....	3
SOC	3605.....	3
SOC	3640.....	3
SOC	3880.....	3
SOC/INST	4110	3
SOC/INST	4370.....	3

Total Core Hrs. 12

Elective courses:

Complete 9 additional hours of sociology courses. Electives may be used either to develop additional expertise in an area of interest or to broaden the student’s sociological training.

Undergraduate Minor

The sociology minor requires a total of 18 sociology credits including SOC 1000. At least 9 of these 18 hours must be upper-division sociology credits.

Only grades of C or better can be counted toward the minor. Also, A&S students seeking a minor must have 12 credit hours exclusive to the minor and not counted toward their major.

Honors in Sociology

Sociology majors with a 3.200 overall GPA, a 3.500 GPA in sociology courses and one 5000-level sociology course graduate with honors in sociology. The department also nominates students for membership in *Alpha Kappa Delta*, the international honorary society for sociology. Selection is based on academic excellence.

Sociology (SOC)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1000. Sociological Principles. 3. [CS◀▶H] Provides a survey of the discipline and foundation for other sociology courses. Explores major areas of interest — ranging from small groups and families to bureaucracies and social movements. Introduces significant concepts and theories, along with tools of social research. Gives attention to contemporary American society, as well as comparative and historical material.

1100. Social Problems and Issues. 3. [I,L◀▶(none)] Explores various approaches to defining and identifying social problems and applies basic sociological concepts and methods to analysis of selected social problems and issues.

1350. American Indians in Contemporary Society. 3. [CS,D◀▶(none)] Survey lecture course. Examines social and cultural issues and concerns of American Indians both on and off the reservations. Additionally, the status of American Indian people within the dominant society and culture are explored. Cross listed with NAIS 1350.

2070 [2000]. Introductory Statistics for the Social Sciences. 4. [QB◀▶Q] Presents central ideas of descriptive statistics and statistical inference, as applied to questions in social sciences. Includes graphs, averages, sampling, estimation, hypothesis-testing and relationships between variables. Introduces associated computer skills. Credit cannot be earned in more than one of STAT 2010, 2050, 2070, 4220, 5520. Cross listed with STAT 2070. *Prerequisite:* MATH 1000, 1400 or equivalent.

2350. Race and Ethnic Relations. 3. [D◀▶(none)] Examines social relations among majority and minority groups by devoting particular attention to race and ethnic relations in

the U.S. Encompasses sociological approach to this topic, which emphasizes power structures, economic relationships and cultural traditions historically and today. Devotes attention to social psychological issues, such as prejudice, and social structural issues, such as class inequality. *Prerequisite:* SOC 1000.

2400 [3300]. Criminology. 3. Generally introduces the nature of crime, statistics on crime, types of criminal behavior and explanations of crime. Cross listed with CRMJ 2400. *Prerequisite:* SOC 1000.

3000 [2100]. Social Change. 3. [G◀▶(none)] Studies causes, processes and consequences of structural transformations in historical and comparative perspective. Reviews and assesses forces that account for sociological changes. Explores social change globally as well as in the U.S. Cross listed with INST 3000. *Prerequisites:* SOC 1000 and junior standing.

3100. Chinese Society. 3. [G◀▶(none)] Reviews origins and consequences of Chinese revolution in comparative and cultural perspectives. Discusses influence of historical traditions and social structure on individual lives and behavioral patterns. Cross listed with INST 3100. *Prerequisite:* SOC 1000.

3110 [2110]. Self and Society. 3. Considers social behavior at the micro level, emphasizing the influence of society on the individual’s thoughts, emotions and behaviors. Topics such as the development of the self over the life course, the self in social interaction, and the role of attitudes and emotions in social interaction are discussed. *Prerequisite:* SOC 1000 or PSYC 1000.

3140. [4100, 4140] Sociology of the Family. 3. Two major themes of the course are change experienced by the family institution and the centrality of the family in America today. Subjects that are covered include: A brief history of the family in the U.S., kinship, family structure, mate-selection, marriage, divorce and socialization. *Prerequisite:* SOC 1000.

3150. Collective Behavior and Social Movements. 3. Analyzes and explains fads, fashions, rumors, riots and mass behavior in light of theoretical frameworks. Studies social movements including blacks, women, labor, religions and students. *Prerequisite:* SOC 1000.

3180. [3090, 4095]. Sociological Research Methods. 3. Examine the design and conduct of social research. Students will complete a research prospectus, including formulating a sociological research question, developing hypotheses, conducting a literature review, surveying prospective data, speculating about potential findings, and discussing implications. *Prerequisites:* STAT/SOC 2070 or STAT 2050 and SOC 1000.

3200. Sociology of Religion. 3. Introduces various ways sociologists interpret religion. Explores the nature of relationships between religion and society. *Prerequisite:* SOC 1000.

3250. Juvenile Delinquency. 3. Considers the nature of delinquency, including an analysis of treatment methods and the juvenile justice system. Cross listed with CRMJ 3250. *Prerequisites:* CRMJ/SOC 2400.

3400 [4200]. Deviant Behavior. 3. Examines theory and research relevant to understanding deviant behavior in general and specific types of individual and subcultural deviancy. Cross listed with CRMJ 3400. *Prerequisite:* SOC 1000.

3500. Sociology of Gender. 3. Explores gender through a cultural and structural approach. The cultural approach emphasizes the variability in social expectations for men and women across time and place; the structural approach analyzes the effect of social institutions such as family, government, education, and the economy of gender. *Prerequisite:* SOC 1000.

3550. Medical Sociology. 3. Considers sociological contributions to diagnosis and treatment of illness. Studies social organization of health professions and agencies. *Prerequisite:* SOC 1000.

3605. Sociology of Education. 3. An introductory overview of the principal areas of inquiry in the field. Students learn relevant theories and concepts, principal methodological approaches as well as important current issues in education. Comparative analysis may focus on historical comparisons, national/global comparisons, U.S. regional, and/or variant educational systems at the local level. *Prerequisite:* SOC 1000.

3640 [4000, 4050]. Social Inequality. 3. Focuses on the structure and consequences of unequal access to political, economic and social benefits in U.S. society and the world. This course critically examines institutional arrangements that perpetuate and are supported by inequality and stratification, as well as patterns of social mobility. *Prerequisites:* SOC 1000.

3880. Political Sociology. 3. Study of political theory, political organization, political mobilization, the state, nation-building, national identity, post-nationalism, the relationship between the state and markets, historic formation of the nation-state, and the changing role of the state in a global context. *Prerequisite:* SOC 1000.

3950. Environmental Sociology. 3. Explores how ecology, technology, politics, economics, and culture intersect. By analyzing key contemporary environmental debates, students will develop an understanding of sociological analyses, and the impact of social life on our environment, as well as the effect of the environment on social life. Topics covered include: the environmental movement; sustainable

development; developing nations and their environment; capitalism and technology; and environmental justice. Cross listed with ENR 3950. *Prerequisite:* SOC 1000.

4020 [4560]. Sociology of Work. 3. Examines social organization of work—especially in response to change in technology, demands for equal opportunity, size and goals of firms and desires for meaningful work. Historically and comparatively analyzes work-life experiences shaping of labor markets and role of collective action. Explores impact of the labor process on distribution of society's material and symbolic rewards. Dual listed with SOC 5020. *Prerequisite:* SOC 1000, MGT 3210 or ECON 1010.

4110. Sociology of International Development. 3. Surveys development studies and rural change, including case studies of deliberate change efforts toward industrialization. Includes peasant modes of food production, daily life in subsistence, agriculture, shifts to commercial agriculture and global economy, ethical and critical issues of induced change and different approaches to development process and outcomes. Cross listed with INST 4110. *Prerequisites:* SOC 1000 or ANTH 1200; SOC 3000 recommended.

4160 [4150]. Sociology of Aging. 3. The process of aging from the individual to the societal level is the focus of the course. Consequences of this process such as the increase in the number of elderly, retirement and health are examined from the major social institutions, the relationships between these institutions and American society as a whole. Dual listed with SOC 5160. *Prerequisite:* 6 hours of sociology (including SOC 1000) and at least junior standing.

4350. Sociology of Law. 3. A consideration of sociological concepts such as inequality, stratification, social control and social change in an analysis of the law and legal institutions. Topics include: the role of the police, lawyers, judges, and juries; race, sex, age, and sexuality discrimination and civil rights; free speech, and toxic torts. Cross listed with CRMJ 4350; dual listed with SOC 5350. *Prerequisites:* 6 hours of sociology/criminal justice, including SOC 1000, and at least junior standing.

4370. Global Political Economy. 3. [G◀(none)] Examines the interaction of politics and the economy at the global level. Evaluates how political and economic decisions of one country or groups of countries affect institutions and life circumstances in others. Assesses the causes of consequences of globalization as rooted in political economy. Cross listed with INST 4370. *Prerequisites:* SOC 1000 and junior standing or SOC 3000.

4440. Deviance and Social Control. 3. In-depth examination of theory and research on the social construction and social control of deviance. Dual listed with SOC 5440. *Prerequisite:* 9 hours of SOC courses and upper division standing.

4500. Sociology of Organizations. 3. Complex organizations have been described as the dominant feature of modern societies. Organized on the basis of bureaucratic modes of administration, they dominate contemporary societal institutions, such as the economy, the polity, education, religion, and the military. This course investigates basic structures and processes of all types of complex organizations. *Prerequisites:* 6 hours of SOC including SOC 1000 and junior/senior or graduate student standing.

4650. Urban Sociology. 3. Considers growth of metropolis and its impact upon modern life. Dual listed with SOC 5650. *Prerequisite:* SOC 1000 and junior standing. (Offered based on sufficient demand and resources)

4705. Global Terrorism. 3. Examines the concept, causes, incidence, types, consequences of, and responses to terrorism. Highlights the distinction between domestic and international terrorism and expands on the latter within the framework of the global environment. Cross listed with CRMJ 4705 and INST 4705. *Prerequisites:* 9 hours in CRMJ, INST, or SOC coursework.

4715 [3700, 3900]. Sociological Theory. 3. Examines the emergence and development of sociological theory in the writings of thinkers such as Marx, Durkheim, and Weber. Explores continuities and discontinuities between the classical period of sociological theory and contemporary schools such as functionalism, conflict theory, neo-Marxian theories, symbolic interactionism, phenomenology, and rational choice/exchange theory. Dual listed with SOC 5715. *Prerequisite:* 9 credit hours of sociology, including SOC 1000.

4805. Global Population Issues. 3. Considers population structure and demographic transition, with applications to topics such as global population growth, population aging, health, family, migration, urbanization, environment. Dual listed with SOC 5805. *Prerequisites:* SOC 1000 and SOC/STAT 2070 or equivalent.

4850. Conference. 1-6 (Max. 6). Considers topics of current sociological interest in consultation with a faculty member. *Prerequisites:* senior standing and 15 hours of sociology.

4890. Special Topics in _____. 1-3 (Max. 6). Accommodates seminar series and/or course offering by visiting faculty whose subject matter is not included in other courses. *Prerequisites:* junior standing and consent of department.

4900. Seminar. 3-6 (Max. 6). Considers special topics of current sociological interest. May be repeated for maximum of 6 hours credit when topic of seminar is different. *Prerequisite:* consent of instructor.

4970. Sociology Internship. 3. Students gain practical experience in the application of principles learned in sociology courses. Students work with the internship coordinator to select a site and faculty supervisor; intern approximately six hours per week in the host organization; and complete readings and written assignments which reflect the student's work. Satisfactory/Unsatisfactory Only. *Prerequisites:* sociology major or minor with a minimum of junior standing and the completion of SOC 1000, and two additional sociology courses.

5000. Advanced Sociological Theory. 3. A consideration of the nature of theory and the major theoretical perspectives in sociology. *Prerequisite:* SOC 3900 or equivalent.

5020. Sociology of Work. 3. Examines social organization of work—especially in response to change in technology, demands for equal opportunity, size and goals of firms and desires for meaningful work. Historically and comparatively analyzes work-life experiences shaping of labor markets and role of collective action. Explores impact of the labor process on distribution of society's material and symbolic rewards. Dual listed with SOC 4020. *Prerequisite:* SOC 1000, MGT 3210 or ECON 1010.

5050 [4000]. Social Inequality. 3. Focuses on the structure and consequences of unequal access to political, economic and social benefits in the U.S. and the world. Critically examines institutional arrangements that perpetuate and are supported by inequality and stratification, as well as patterns of social mobility.

5070. Statistical Methods for the Social Sciences. 3. General statistical analyses and their application to the social sciences. Analysis of variance, regression and correlation methods are studied from a data analytic perspective, emphasizing the conceptual understanding of where and when these techniques should be used and the interpretation of their results. Available computer programs are utilized. Credit cannot be earned in more than one of the following courses: STAT 2110, 3050, 5050, 5060, 5070, 5080. Cross listed with STAT 5070. *Prerequisite:* one course in statistics (all introductory courses except STAT 2000).

5100. Advanced Social Research Methods. 3. In-depth survey of research concepts and methods with emphasis on application that culminates in the designing and execution of a research project by the student. *Prerequisite:* SOC 5070 or equivalent.

5140. The Family. 3. Two major themes of the course are change experienced by the family institution and the centrality of the family in America today. Subjects that are covered include: A brief history of the family in the United States, kinship, family structure, mate-selection, marriage, divorce, and socialization. Dual listed with SOC 4140. *Prerequisite:* 6 hours in sociology including SOC 1000 and at least junior standing.

5160. Sociology of Aging. 3. The process of aging from the individual to the societal level is the focus of the course. Consequences of this process such as the increase in the number of elderly, retirement and health are examined for the major social institutions, the relationships between these institutions and American society as a whole. Dual listed with SOC 4160. *Prerequisite:* 6 hours of sociology including SOC 1000 and at least junior standing.

5200. Conference. 1-8 (Max. 8). Consideration of topics of current sociological interest in consultation with a member of the faculty. *Prerequisite:* consent of instructor.

5250. Seminar. 3 (Max. 12). Consideration of topics of sociological interest in the content of a graduate seminar. Cannot be dual-listed with any course below the 5000 level. May be repeated for credit when the topic of the seminar is different. *Prerequisite:* consent of instructor.

5350. Sociology of Law. 3. A consideration of sociological concepts such as inequality, stratification, social control and social change in an analysis of the law and legal institutions. Topics include: the role of the police, lawyers, judges, and juries; race, sex, age, and sexuality discrimination and civil rights; free speech, and toxic torts. Cross listed with CRMJ 4350; dual listed with SOC 4350.

5440. Deviance and Social Control. 3. In-depth examination of theory and research on the social construction and social control of deviance. Dual listed with SOC 4440. *Prerequisite:* graduate standing.

5540. Stratification and Inequality. 3. In-depth survey of sociological theory and research on substantive issues such as social class structure, racial/ethnic relations, and gender stratification. *Prerequisite:* graduate standing.

5650. Urban Sociology. 3. Considers growth of metropolis and its impact on modern life. Dual listed with SOC 4650. *Prerequisite:* SOC 1000 or equivalent.

5715 [3700]. Sociological Theory. 3. Examines the emergence and development of sociological theory in the writings of thinkers such as Marx, Durkheim, and Weber. Explores continuities and discontinuities between the classical period of sociological theory and

contemporary schools such as functionalism, conflict theory, neo-Marxian theories, symbolic interactionism, phenomenology, and rational choice/exchange theory. Dual listed with SOC 4715. *Prerequisite:* 9 credit hours of sociology, including SOC 1000.

5805. Global Population Issues. 3. Considers population structure and demographic transition, with applications to topics such as global population growth, population aging, health, family, migration, urbanization, environment. Dual listed with SOC 4805. *Prerequisites:* SOC 1000 and SOC/STAT 2070 or equivalent.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 12). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). The course is designed to provide an enrichment experience in a variety of topics. Note: Credit in this course may not be included in a graduate program of study for degree purposes. Offered S/U only. *Prerequisite:* graduate standing.

5960. Thesis Research. 1-12 (Max. 24). Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

English

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Associate Professors:

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Assistant Professors:

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NANCY SMALL, B.A. Texas A&M University 1992; M.A. 1994; Ph.D. Texas Tech University 2014; Assistant Professor of English and Director of Writing Programs 2017.

ARIELLE ZIBRAK, B.A. University of Rochester 2003; M.A. Boston University 2007; Ph.D. 2013; Assistant Professor of English 2014.

Senior Lecturers:

PAUL BERGSTRAESSER, B.A. Oberlin College 1989; M.A. Northern Michigan University 2000; Ph.D. University of Illinois, Chicago 2007; Senior Lecturer in English and Creative Writing 2018, 2007.

APRIL HEANEY, B.A. University of Wyoming 1998; M.A. 2000. Senior Lecturer in English and Creative Writing 2015, 2005.

VAL PEXTON, B.A. Humboldt State University 1986; B.A. University of Wyoming 1998; M.A. 2001; M.F.A. 2008; Senior Lecturer in English and Creative Writing 2018, 2009.

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Assistant Lecturers:

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Study in the English department today emphasizes composition, literature, and rhetoric, creative and expository writing, and the nature and workings of language. Students in the department's programs can learn to read with pleasure and understanding, to write with grace, clarity and force, and to think with greater depth and breadth. With these accomplishments, students are prepared for lives and work in which their power to understand, read, write and communicate will serve themselves and others, some specifically in careers in writing or teaching, some in professions of law, medicine, administration or almost any other field.

Composition, Literature, and Rhetoric are traditions that reach back through the centuries, but these intellectual traditions are continually growing and changing. New theories of language help us reshape understandings of ancient traditions and enhance our lives as critical readers and writers and creative human beings.

Assessment of English Undergraduate Learning

Through an active and ongoing assessment of our program, we have identified the following outcomes that are expected of each student graduating with a Bachelor of Arts in English. We will continue to assess our curriculum to ensure these outcomes are being met:

UW students graduating with a Bachelor of Arts in English will have demonstrated an ability to:

1. Read, interpret, and write about a diverse range of texts in English, for example literature, film, digital media, and popular culture;
2. Understand those texts analytically and critically;
3. Understand those texts on the basis of careful close reading;
4. Understand those texts through past and current literary and rhetorical theory;
5. Understand that those texts are culturally constructed in time, place, and tradition;
6. Understand how those texts inform culture;
7. Participate in the critical and cultural discourses of English;
8. Participate clearly and appropriately through multiple spoken and written forms.

The English Undergraduate Major

The English major requires 36 hours of work within the major and an additional 12 hours of a single foreign language. 21 of the hours within the major must be taken at the upper division. Only those courses in which a grade of C or better has been earned may count toward the 36 hours required for the B.A. and the foreign language requirement. No 1000-level courses count toward the B.A.

Specific courses that fulfill the Expanding the Canon requirements will be identified each semester. They will focus on global/postcolonial texts or texts of diversity (e.g. Native American, African-American, and Latinx literatures; feminist or queer theory, disability studies). Additional courses that may fulfill the Historical Period requirements beyond those listed below will also be identified each semester.

Prerequisites

Most 2000-level courses require the completion of the COM1 requirement. Normally, 3000-level courses have the COM1, ENGL 2025, and one 2000-level "broad historical sweep" course (one of ENGL 2410, 2425,

2430, 2435, 2340, 2350, 2360) as prerequisites, and 4000-level courses have 6 hours of 2000-level English courses as prerequisites. Students without certain prerequisites should consult the English department for permission to enroll.

English Tracks

There are two tracks within the English degree: a Literary Studies track and an English Studies track. The former focuses on the study of literature and culture, while the latter balances literary study with courses in rhetoric and composition and professional writing. All English Education students are required to take the English Studies track.

Literary Studies Track

Requirements Hrs.

1. Gateway to the English Major3
ENGL 2025: Introduction to English Studies (COM2)
2. Historical Period Classes15
Take two of the following six courses:
ENGL 2425
ENGL 2430
ENGL 2435
ENGL 2340
ENGL 2350
ENGL 2360
Take three of the following five courses:
ENGL 3200
ENGL 3300
ENGL 3400
ENGL 3500
ENGL 3600
3. Expanding the Canon Classes6
ENGL 2340/2350/2360 can be taken either as an Expanding the Canon course OR as an Historical Period course. The Expanding the Canon options are always changing, but they will always include at very least the following: ENGL 2340, 2345, 2350, 2360, 3330, 3710, 4450, 4455, 4460, 4470, 4640: Postcolonial Literature, 4830. A full list of courses that fulfill the Expanding the Canon requirements will be published each semester; generally speaking, these courses will cover topics related to racial diversity, global literatures, gender, sexuality, or disability studies.
4. Literary Studies Methods Course3
ENGL 3000: Literary Theory

5. Electives6
Students can select from any of our courses for credit in this category; one of the three electives must be in either Rhetoric & Composition (ENGL 2005, 2035, 2125, 3020, 4000, 4010, 4020, 4025, 4030, 4061, 4075) or Creative Writing
6. Capstone Course3
ENGL 4999: Senior Seminar (COM3)

Total hours 36

Note: At least 21 of the 36 credit hours must be upper division (3000-level or higher).

English Studies Track

Requirements Hrs.

1. Gateway to the English Major3
ENGL 2025: Introduction to English Studies (COM2)
2. Historical Period Classes 12
Take one of the following six courses:
ENGL 2425
ENGL 2430
ENGL 2435
ENGL 2340
ENGL 2350
ENGL 2360
Take three of the following five courses:
ENGL 3200
ENGL 3300
ENGL 3400
ENGL 3500
ENGL 3600
3. Expanding the Canon Classes6
ENGL 2340/2350/2360 can be taken either as an Expanding the Canon course OR as an Historical Period course. The Expanding the Canon options are always changing, but they will always include at very least the following: ENGL 2340, 2345, 2350, 2360, 3330, 3710, 4450, 4455, 4460, 4470, 4640: Postcolonial Literature, 4830. A full list of courses that fulfill the Expanding the Canon requirements will be published each semester; generally speaking, these courses will cover topics related to racial diversity, global literatures, gender, sexuality, or disability studies.
4. English Studies Methods Course3
ENGL 3010: Approaches to Rhetoric, Composition Pedagogy, and Professional Writing
5. Foundations of Language3
One class in History of the English Language or Social Linguistics (ENGL 4780; ENGL 4785 is acceptable, as are EDCI 4761 and 4762.)

6. Electives6
2 courses from the list of Rhetoric/Composition/Professional Writing courses offered by English (ENGL 2005, 2035, 2125, 3020, 4000, 4010, 4020, 4025, 4030, 4061, 4075) and approved courses offered by other departments. Sample course topics include Writing for the Web, Publication Editing, and Rhetorical Theory.
7. Capstone Course3
ENGL 4999: Senior Seminar (COM3)

Total hours 36

Note: At least 21 of the 36 credit hours must be upper division (3000-level or higher).

English Honors Program

Requires a 3.500 GPA and a senior honors paper and defense. See the English department web site for information.

Minor in Literary Studies

To minor in literary studies, a student must complete the following 18-credit sequence of courses:

Requirements

Hrs.

1. ENGL 20253
2. Historical Period Classes6
Take any 2 of the following historical period courses:
ENGL 2425 (Survey I: Literatures written in English through 1750)3
ENGL 2430 (Survey II: Literatures written in English, 1750-1865)
ENGL 2435 (Survey III: Literatures written in English, 1865-present)3
ENGL 2340 (Intro to African-American Literature)3
ENGL 2350 (Intro to Native American Literature)3
ENGL 2360 (Intro to Mexican-American Literature)3
ENGL 3200: Medieval Literature3
ENGL 3300: Shakespeare/Renaissance Literature3
ENGL 3400: 18th Century Literature3
ENGL 3500: 19th Century Literature3
ENGL 3600: 20th Century & Contemporary Literature3
3. 4000-level literature courses9
Take any additional 3 upper-division literature courses. Please consult with department for options in this category.

Minor in Professional Writing

To minor in professional writing, a student must complete the following 18-credit sequence of courses:

Requirements	Hrs.
1. Foundations Course.....3 ENGL 2035 or ENGL 2005 (COM2)	3
2. Program Electives.....6 Take any 2 of the following courses: ENGL 4010: Technical Writing in the Professions (COM3) ENGL 4020: Editing for Publication ENGL 4025: Writing for the Web (COM3) ENGL 4050: Writer's Workshop in: ENGL 4075: Writing for Non-Profits (COM3) ENGL 4970: Writing Internship	6
3. Other Electives.....6 Courses from any discipline that relates to professional writing; consult with a Professional Writing Minor advisor.	6
4. Professional Writing Minor Capstone .....3 ENGL 4000	3

Teacher Certification

Students seeking the B.A. in English may also be certified for public school teaching by completing additional requirements set forth by the College of Education, via a concurrent major in English and English Education.

Graduate Study

The M.A. graduate program in English offers three concentrations leading to the master of arts degree: Literary Studies, Composition and Rhetoric, and Public Humanities.

Program Specific Admission Requirements

Master of Arts in English

In addition to the minimum requirements set forth in this *Catalog*, the Department of English requires that students demonstrate by means of an official transcript that they have a solid undergraduate record with course work in English. That said, the department welcomes degrees in English or other disciplines from four-year colleges or universities.

Depending on their undergraduate preparation, some successful applicants may be required to take additional or specific courses toward the English master's degree.

Candidates must submit GRE general test scores, a writing sample, a 500-word statement of purpose, a CV/resume, and three letters of recommendation.

English offers both a campus-based M.A. degree and a low-residency/online M.A. degree. Students should consult the M.A. web

site or contact the department for specific admission information and deadlines for both M.A. programs.

Program Specific Graduate Assistantships

Teaching assistantships are available to qualified applicants in the campus-based M.A. degree. Full assistantships carry an annual stipend and a remission of full-time tuition and fees, and require the teaching of one course per term.

Each fall the department conducts a week-long orientation for new teaching assistants and a subsequent series of colloquia for all graduate assistants. Each assistant is assigned an experienced teacher in the department as a mentor, to be available throughout the semester for consultation on teaching and grading techniques.

Program Specific Degree Requirements

Master of Arts in English Plan A (thesis)

The Department of English offers three concentrations within the master of arts degree. A concentration consists of three courses chosen from among those designated by the department as belonging to that concentration, together with other courses to total 26 hours. The concentration insures coherence in each student's graduate program; breadth is insured by a distribution of courses. Much of each student's program is taken in courses outside the concentration. Seminars will usually include students from all concentrations.

Literary Studies. Working from a variety of perspectives, this concentration focuses on the study of literature and of other culturally significant texts and materials, including, for example, film, oral materials, and political documents.

Rhetoric, Composition, and Writing Studies. This concentration emphasizes scholarship on the production of discourse, broadly conceived, and may include a focus on classical, contemporary, or cultural rhetoric; post-secondary writing pedagogy and program administration; community and adult literacy; or other subjects related to the field of writing studies.

Public Humanities. Designed for students who wish to pursue professions that may span beyond traditional academic work, this concentration prepares graduates for careers in civic, nonprofit, and community-based cultural

organizations that engage the humanities, contribute to social reform, and promote the public good.

26 hours of coursework and a thesis for 4 additional hours (ENGL 5960 and ENGL 5965).

A reading exam and oral thesis defense. Students may write a traditional thesis, or they may assemble a public-facing thesis portfolio. See program website for more details about thesis options.

With approval of the graduate adviser, a student may take a maximum of three hours credit outside the department.

All coursework must be at the 5000-level.

For information on the Plan B, consult with the program director.

English (ENGL)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1010. College Composition and Rhetoric 3. [WA▶COM1] A composition course emphasizing expository writing, analytical reading, and academic and civic argumentation in a range of print, oral, and digital genres. A grade of C or better is required to meet the COM1 requirement. Students may not have credit in both ENGL 1010 and UWYO 1000, 1110 or 1210.

1030. Intellectual Community in Cinema Etc. 3. [I▶(none)] Introduces students to a range of issues within the humanities through the analysis of film, television, and theater.

1080. Introduction to Women's Studies. 3. [CH,D▶(none)] An introduction to key issues in women's studies. A topical examination of women's participation in and relationship to institutions of society, such as family and school, as well as processes and activities, such as work, art, and politics in historical and cross-cultural analysis. Cross listed with WMST 1080.

1101. First-Year Seminar. 3. [(none)▶FYS]
2005. Writing in Technology and the Sciences. 3. [WB▶COM2] Develops writing styles specifically suited to technological and scientific fields of study. Includes focus on disciplinary conventions and styles as well as audience/readership considerations. Introduces techniques for data interpretation and visualization, and helps students analyze, understand, and adapt common field genres and formats. *Prerequisite:* successful completion of WA/COM1.

2015. College Composition and Rhetoric II: College and Career. 3. [(none)◀COM2] ENGL 2015 helps students become stronger writers, speakers, and thinkers, and features assignments that explore issues that pertain to students' majors and future careers. Students will engage in different genres for a range of audiences, revise substantially, and practice critical thinking in academic, civic, and professional contexts. *Prerequisite:* ENGL/Synergy 1010 (COM1).

2020. Literature, Media and Culture. 3. [CH,WB▶COM2] Introduces students to the basic tools of literary, film, and media analysis and develops students' critical writing, digital analysis, and oral communication skills. No expertise in literary criticism or film theory is necessary in this course; all majors are welcome. *Prerequisite:* COM1. COM1 may not be taken concurrently.

2025. Introduction to English Studies. 3. [(none)▶COM2]. This course provides an introduction to English Studies, covering the history of English as an academic field, the options available within it, and possible career paths. Students will also be taught the skills they need to succeed as English majors, including critical reading and writing, and literary and rhetorical analysis. *Prerequisite:* COM1; English major status.

2035. Writing for Public Forums. 3. [WB▶COM2] Introduction to professional writing that focuses on analyzing and producing texts designed to influence public opinion. Genres may include letters, editorials, web pages, pamphlets, e-mail, speeches, and position papers. Focuses on skills in collaboration and use of technology necessary for ethical, effective participation in public discourse. *Prerequisite:* WA/COM1.

2125. Writing Tutor Pedagogy/Practicum. 3. [WB▶COM2] Prepares students for professional employment as writing tutors in a writing center environment. Students will gain a detailed understanding of the history of writing centers, the development of writing center studies and theory, and the innovative trends in contemporary writing center practices and organization. *Prerequisites:* ENGL 1010 or COM1/transfer equivalent with a grade of B or higher; 3.000 GPA or higher.

2170. The Bible as Literature. 3. A study of the Bible as a body of literary expression with an introduction to critical technique appropriate to such study. *Prerequisite:* WA/COM1.

2190. African Literature. 3. A study of the modern literature of Africa written in English, against its background of the continent's oral traditions. *Prerequisite:* WA/COM1.

2240. Arthurian Legend. 3. An introduction to both Arthurian romance and writing about literature. Traces the Arthurian Legend from its roots in Welsh mythology through its development in the Middle Ages and to its current manifestations in popular culture. *Prerequisites:* WA/COM1; sophomore standing.

2340. Native American Culture and Literature. 3. [CH,D▶(none)] Broad cultural study of Native Americans, past and present. Emphasizes folklore and literature. Cross listed with NAIS 2340. *Prerequisite:* WA/COM1.

2345. American Indians in Hollywood Film. 3. [CH▶(none)] Examines the ways Hollywood film has constructed various forms of racial identity for American Indians. Cross listed with NAIS 2345. *Prerequisite:* WA/COM1.

2350. Introduction to African American Literature. 3. [WB,D<>{none}] Provides an introduction to the major works of the African American literary tradition. Covering a wide range of fiction, poetry, drama, and autobiography, the course introduces students to some of the most exciting works of literature ever to appear in America. Cross listed with AAST 2350. *Prerequisite:* WA/COM1.

2360. Mexican American Literature. 3. [CH,D▶H] Discusses literary reflections of Chicanoism. Studies literature of the Hispanic Southwest, Mexican-American folklore and the contemporary Chicano movement. Cross listed with LTST 2360. *Prerequisite:* WA/COM1.

2410. Literary Genres. 3 (Max. 6). [CH,WB▶H] Studies specific genres of literature. Emphasis will vary (poetry, fiction, drama, etc.) from semester to semester, depending on curricular needs. *Prerequisite:* WA/COM1.

2425. Literatures in English I. 3. [CH▶(none)] Surveys major figures and literary movements in literatures written in English through 1750. *Prerequisite:* WA/COM1.

2430. Literatures in English II. 3. [CH▶(none)] Surveys major figures and literary movements in literatures written in English 1750-1865. *Prerequisite:* WA/COM1.

2435. Literatures in English III. 3. [CH▶(none)] Surveys major figures and literary movements in literatures written in English 1865-present. *Prerequisite:* WA/COM1.

2490. Studies in_____. 1-6 (Max. 6). Presents a variety of topics in literature. *Prerequisite:* WA/COM1.

3000. Literary Theory. 3. An introduction to critical theory as a methodology within literary studies. The course covers major schools of theory and major figures within those schools. Students will read, discuss, and write about literary texts and cultural artefacts by placing

them in dialogue with important works of both theory and literary criticism. *Prerequisites:* ENGL 2025 and junior standing.

3010. Approaches to Rhetoric, Composition Pedagogy, and Professional Writing. 3. Introduces common methods, concepts, and theories emphasized in these interrelated intellectual traditions. It asks students to examine how research traditions have developed alongside each other over time, and prepares students to design a multimodal research project. *Prerequisites:* ENGL 2025 and junior standing.

3020. Culture, Communication, Work. 3. [(none)▶COM3] Examines individual identity and group cultures, and how they influence communication in the workplace. Helps students develop strategies for working across cultural differences and for effective negotiation and conflict resolution skills. *Prerequisite:* Completion of COM2.

3100. Tribal Literatures of the Great Plains. 3. [WC,D▶(none)] Familiarizes students with American Indian literatures of the Great Plains. The Great Plains region is the locus of much historical and contemporary significance in regard to American Indian cultures. The literature of Great Plains Indians allows students to confront and reexamine the national narratives surrounding American Indians. Cross listed with NAIS 3100. *Prerequisite:* 6 hours of NAIS or ENGL.

3150. World Literature. 3 (Max. 6). [CH,G▶(none)] Encompasses reading and analysis of major works representative of significant periods or literary forms in the history of literature. *Prerequisites:* WA and WB/COM1 and COM2.

3200. Topics in: Medieval Literature. 3 (Max. 12). This course focuses on the language, literature, history, and culture of England between 800 and 1485, including influential texts from continental and Arabic traditions. Students will be taught to read Middle English and the class will include a translation component. *Prerequisites:* COM1 and 6 hours of 2000-level literature courses.

3300. Topics in: Renaissance Literature. 3 (Max. 12). Surveys important authors and texts from Britain, Europe, and the "new world" from 1500-1642. Covers major literary movements and genres, and contextualizes materials by discussing the historical, cultural, and political developments of the period. Examines how literature is produced and consumed in the sixteenth century. Specific focus varies by section. *Prerequisites:* COM1 and 6 hours of 2000-level literature courses.

3330. Global Shakespeare in Performance.

3. Shakespeare's works are constantly being reinterpreted around the globe, because their cultural capital invites many cultures to re-brand Shakespeare as their own. While helping us to see universal connections, recorded re-interpretations provide opportunities for viable cross-cultural analysis, as we explore and compare the hot-button cultural issues addressed through global performance. *Prerequisite:* COM1.

3340. Philosophy in Literature. 3 (Max 6).

Examines central themes in literary works with philosophical significance; studies related general issues. Issues include questions of interpretation, criticism, and translation, as well as the possibility of direct philosophical influence on authors. Cross listed with ENGL 3340. *Prerequisite:* one course in philosophy or one course in literature or consent of instructor.

3400. Topics in: Eighteenth-Century Literature. 3 (Max. 12).

Topics in eighteenth-century American and/or British literatures. Readings situated amid the historical and social developments of the era, including the expansion of mercantilism and slavery, the spread of secularism, the rise of print capitalism, and the emergence of new ideas of self and authorship. Subject matter varies by section. *Prerequisites:* COM1, ENGL 2025, and 3 hours of a 2000-level literature course.

3500. Topics in: Nineteenth-Century Literature. 3 (Max. 12).

This course surveys authors, movements, and/or genres significant to 19th Century American or British literature, and contextualizes materials by discussing the historical, cultural, and political developments of the period. *Prerequisites:* COM1 and 6 hours of 2000-level literature courses in ENGL.

3600. Topics in: 20th Century Literature. 3 (Max. 12).

Surveys important authors and texts from Britain, the U.S., and around the world from 1900 to present-day. Covers major literary movements and genres, including modernism and postmodernism, and contextualizes materials by discussing the historical, cultural, and political developments of the period. Examines how literature is produced in our contemporary moment. *Prerequisites:* COM1 and 6 hours of 2000-level literature courses in ENGL.

3610. Non-Western Women Writers. 3.

Examines literature written by women in non-western cultures. The geographical region, time period, and genres of literature may vary by semester. Analyzes representations of such topics as family, marriage, sexuality, community, and colonialism as expressed in

fiction, drama, literary non-fiction, and/or poetry. *Prerequisites:* ENGL 1010 or WMST 1080; junior standing.

3710. Gender: Humanities Focus. 3.

[CH◀▶COM2] Explores how men and women are imaged differently, studying the influence of representation on gender (including representations in literature, film, art, popular culture, and/or performance). Sharpens students' ability to analyze texts and images and investigate those texts' messages about gender, sexuality, ethnicity, and class. Cross listed with ART/WMST 3710. *Prerequisite:* WMST 1080 or ENGL 1010.

4000 [3000]. 21st Century Issues in Professional Writing. 3. [WC▶COM3]

Examines ethical, cultural, and practical issues for writers in complex, real-world scenarios that pose communication challenges. Focuses on applying fundamental principles of rhetoric, effective research methods, analytical skills, and design technologies to collaborative and individual problem-based projects. *Prerequisites:* WA and WB/COM1 and COM2; completion of one of the following: ENGL 2005, 2035, 4010, 4020, 4025, or 4075; junior or senior standing.

4010. Technical Writing in the Professions. 3. [WC▶COM3]

Enhances professional writing skills applicable to a variety of professions. Includes audience analysis and adaptation, information design and use of visuals, and a range of formats and genres. Emphasizes clarity and precision of language. May feature primary research and problem-based or service-learning projects. *Prerequisites:* WA and WB/COM1 and COM2; junior or senior standing.

4020. Editing for Publication. 3.

Theory and practice of editing in the contexts of book, magazine, newspaper, and web-based publications. Standard editing practices for using grammar, proofreading marks, and computer editing tools. *Prerequisites:* WA/COM1, WB/COM2 (ENGL 2035 and 3000 recommended).

4025 [3050]. Writing for the Web. 3.

[WC,L▶COM3] Covers a variety of issues relevant for composing in the 21st century. As students learn to design and generate effective writing for a particular audience in a digital environment, they will also develop skills with advanced web and print research, basic HTML programming language, and standard web design software. *Prerequisites:* WB/COM2 and junior standing.

4030. Writing for Magazines. 3.

Students write a variety of articles that would be appropriate for submission to a magazine. Feedback is given through class workshops and consultation with the instructor. Award-winning

articles are read and discusses. The business aspect of magazine writing is also covered. *Prerequisite:* COM1, COM2, and junior standing.

4040. Rhetoric, Media, and Culture. 3.

[(none)▶COM3] This class will guide us through the ways in which popular culture shapes the way that we view ourselves and other, and gives us a vocabulary to describe this phenomenon, critique it, and even push back against it. *Prerequisite:* COM1 and COM2.

4061. Rhetorical Theory and Criticism. 3.

An investigation into how rhetorical theory, spanning from its ancient roots in Aristotelian thinking to its current postmodern components, operates in society. Explores how various critical methods can be utilized to gain a stronger understanding of public communication texts, including newspapers, speeches, music, and film. Cross listed with COJO 4061; dual listed with ENGL 5061. *Prerequisites:* COJO 1040 and 3040 or ENGL 2035.

4070. Film Directors: _____. 3 (Max. 6).

Offers an intensive examination of representative films by selected film makers. *Prerequisite:* 6 hours of 2000-level literature courses.

4075. Writing for Non-Profits. 3.

[WC▶COM3] Designed for students interested in working in the non-profit sector. Explores rhetorical, political, and social dimensions of writing and communicating in the non-profit world and features intensive study of special topics and problems related to non-profit communication, including activism, grant writing, organizational rhetoric, and non-profit genres. Content varies. *Prerequisite:* WB/COM2.

4080. Film Genre Studies: _____. 3 (Max. 6).

Offers structural, film historical, and political analyses of selected major film genres. *Prerequisite:* 6 hours of 2000-level literature courses.

4090. Film and Religion. 3.

Movies use religion to convey messages; they debate religious issues and use religion to debate non-religious issues. This course analyzes how film makers use religion and religious themes to transform religions into advocates for social issues and to shape religion's role in society. Popular films drawn from many genres. *Prerequisite:* 6 hours of 2000-level or higher literature courses or religion courses.

4230. Greek Tragedy. 3.

Reading and discussion of major plays by Aeschylus, Sophocles, and Euripides, together with examination of the performance and social context of Greek drama, its use of traditional myths, and selected issues in contemporary scholarship on the tragedies. Cross listed with CLAS/THEA 4230. *Prerequisite:* WB or COM2. (Offered in spring in alternate years)

4270. Classical Epic Poetry. 3. Reading and discussion of major works of Greek and Latin epic poetry, centered on Homer and Vergil. Also includes consideration of the background of these works (both mythological and historical) and the development of the epic tradition in the ancient world. Cross listed with CLAS 4270. *Prerequisite:* WB or COM2.

4450. African American Novel. 3. [D♦(none)] Considers aesthetic dimension and cultural matrix of novels written by Black Americans. Cross listed with AAST 4450. *Prerequisites:* AAST 1000, any AAST 2000 level course, junior/senior standing, six hours of 2000-level literature courses in ENGL.

4455. Slavery and Freedom. 1-4 (Max. 8). [D♦(none)] Students engage in an in-depth study of the literary voices that emerged from the history of enslavement in the Americas from colonial times through the end of Reconstruction in 1877. Dual listed with ENGL 5455; cross listed with AAST 4455. *Prerequisites:* AAST 1000, any AAST 2000-level course, and junior/senior standing, or six credit hours of literature courses in ENGL.

4460. American Indian Literature. 3. [WC♦(none)] Advanced critical study of the history of American Indian literature, emphasizing the authors' views of social change. Cross listed with NAIS 4460. *Prerequisite:* 6 hours of 2000-level literature courses.

4470. Studies in Chicano Folklore. 3. [CH,D♦H] Provides a survey of the origins, development and contemporary folklore of the Mexican American Chicano people of the United States with comparative relation to Mexico and other groups in the United States. Cross listed with LTST 4470. *Prerequisites:* LTST 1100 and WA/COM1.

4480. Regional Literature of the U.S.: The West. 3. Encompasses major themes and writers in western American literature. *Prerequisite:* 6 hours of 2000-level literature courses.

4600. Studies in _____. 1-6 (Max. 12). Presents from semester to semester a variety of significant topics in American, English, or other literatures. *Prerequisite:* 6 hours of 2000-level literature courses.

4610. Special Studies Abroad in _____. 1-6 (Max. 6). *Prerequisite:* 6 hours of 2000-level literature courses.

4620. Independent Reading in _____. 1-3 (Max. for M.A. 3; Max. 6). Involves independent study and research experience in given topic, person, movement in literature. *Prerequisites:* 6 hours of 2000-level literature courses, consent of instructor, and permission of department chair.

4630. English Honors Thesis. 1-3 (Max. 3). Directed study under the supervision of an English honors thesis chairperson. Results in production of an English honors thesis. Maximum of three credits of ENGL 4630 can be applied to the degree. *Prerequisites:* consent of the Director of the English Honors Program, instructor and department chair.

4635. English Department Honors. 0. Satisfactory completion of this course indicates that English Departmental Honors have been conferred on the student. *Prerequisites:* successful completion and defense of English Honors thesis.

4640. Studies in Emerging Fields and Approaches. 3 (Max. 12). Presents from semester to semester a variety of significant topics in emerging fields or approaches to literature written in English. *Prerequisite:* six hours of 2000 level literature courses.

4780. History of the English Language. 3. Considers major sources of change in the English language historically, as well as some of the internal and external catalysts for the process. Identical to ANTH 4780. *Prerequisite:* ENGL 4750.

4785. Linguistics, Language Teaching and Social Context. 3. Introduces prospective teachers of English as second language to the basic components of language and to the social aspects of human language use. Explores a variety of concepts about language: how it is used and perceived, how languages change, how diverse cultures respond to such changes. Cross listed with LANG 4785. *Prerequisite:* WB/COM2.

4830. Victorian Women's Lives: Their Art, Literature, and Culture. 3. [CA♦(none)] An interdisciplinary approach to the study of women's issues in art, using literary, cultural, and sociological texts to enlarge the art historical basis. Topics include "domestic goddess," class issues, racial questions, working women, prostitution, education, marriage, and divorce. Dual listed with ENGL 5830; cross listed with ART/WMST 4830. *Prerequisites:* ART 2020, WMST/ENGL 1080.

4970. Writing Internship. 3 (Max. 6). Students work 6-8 hours per week as "writing interns" for a private business or public agency, performing specific writing/editing tasks for that client. Students are supported and enabled through a series of classroom sessions and individual meetings with the course instructor. Formal progress reports and a comprehensive final report are required. *Prerequisite:* successful completion of ENGL 4010, 4020, or 4050.

4990. Senior Seminar in English Studies. 3. [WC♦COM3] Considers methods, theories, and history of the study of literature and writ-

ing. In readings, discussion, as well as oral and written presentations, students seek a broad perspective on knowledge and skills gained throughout study in the English major. *Prerequisite:* advanced (senior) standing in English.

4999. Senior Seminar. 3. [(none)♦COM3] This course is the capstone course in the English major. Subject matter varies by section. In all sections students will exercise skills acquired in the major (close-reading, historical analysis, application of theory) to explore significant texts and to reflect on the nature of English study today. *Prerequisites:* COM1, COM2, and either ENGL 3000 or ENGL 3010; Senior standing.

5000. Studies In.: 1-8 (Max. 8). Provides an opportunity for specialized seminar approaches to subjects in literature. *Prerequisite:* graduate status or 12 hours of 4000-level work.

5010. Rhetoric and Composition: History, Theory, Practice. 1-4 (Max. 4). Prepares graduate students to teach college composition and rhetoric at UW and beyond, with attention to the intellectual traditions that inform our writing program's pedagogy. It examines the theories that support informed writing instruction and offers classroom strategies that may be applied to any course in English studies. *Prerequisite:* graduate status or 12 hours of 4000-level work.

5020. Public-Facing English Studies. 1-4 (Max. 8). Introduction to the history and theory of public intellectualism and English studies. Students develop theoretical and practical knowledge and explore alternative applications for academic research for publics beyond the classroom. *Prerequisite:* graduate status or 12 hours of 4000-level work.

5050. Writing in Public Genres. 1-4 (Max. 8). Intensive introduction to public-facing writing in English subject areas, including articles, book reviews, think pieces, TED talks, podcasts, and other genres of commentary associated with public intellectual work in English studies. *Prerequisite:* graduate status or 12 hours of 4000-level work.

5061. Rhetorical Theory and Criticism. 1-4 (Max. 8). An investigation into how rhetorical theory, spanning from its ancient roots in Aristotelian thinking to its current postmodern components, operates in society. Explores how various critical methods can be utilized to gain a stronger understanding of public communication texts, including newspapers, speeches, music, and film. Cross listed with COJO 5061; dual listed with ENGL 4061. *Prerequisite:* graduate status or 12 hours of 3000-4000 level work.

5070. Qualitative Methods in English. 1-4 (Max. 8). Advanced introduction to qualitative research methods in English and

Rhetoric. Students will survey different types of qualitative methods and will learn to evaluate qualitative projects. Includes an emphasis on working with human participants and on ethics. *Prerequisite:* graduate status or 12 hours of 4000-level work.

5075. Non-Profit Writing and Grants. 1-4 (Max. 8). Non-profit writing from a rhetorical perspective. Students analyze different kinds of non-profit communication, including fundraising, mission development, social media. Participate in grant proposal development or other organizational communication activity. *Prerequisite:* graduate status or 12 hours of 4000-level work.

5080. Graduate Apprenticeship. 1. The graduate apprenticeship furthers a graduate student's professional development by allowing him/her to teach in a course other than Freshman Composition and to engage in a close working relationship with a faculty member. Apprentices will engage in a full range of teaching activities, such as grading, constructing assignments and exams, lecturing, leading discussion, and so on. Does not apply to hour requirement for the degree. *Prerequisites:* graduate standing and permission of the English department chair.

5220. Studies in Medieval Literature. 1-4 (Max. 8). A seminar course in selected genres, figures, and themes in Medieval English literature. *Prerequisite:* graduate status or 12 hours or 4000-level work.

5230. Studies in English Renaissance Literature. 1-4 (Max. 8). A seminar in selected genres, figures, and themes of the sixteenth and early seventeenth centuries. *Prerequisite:* graduate status or 12 hours of 4000-level work.

5250. Studies in Shakespeare. 1-4 (Max. 8). To provide advanced students with the opportunity to study problems of text, sources, staging, theatrical history, and/or critical theory with reference to the works of William Shakespeare. *Prerequisite:* graduate status or 12 hours of 4000-level work.

5270. Studies in 18c English Literature. 1-4 (Max. 8). A seminar in selected genres, figures, and themes of restoration and eighteenth century English literature. *Prerequisite:* graduate status or 12 hours of 4000-level work.

5280. Studies in 19c English Literature. 1-4 (Max. 4). A seminar in selected genres, figures, and themes of the romantic and Victorian periods. *Prerequisite:* graduate status or 12 hours or 4000-level work.

5290. Studies in 20c English Literature. 1-4 (Max. 8). A seminar in significant writers of poetry, drama, fiction, and biography from

the end of the nineteenth century to the present. *Prerequisite:* graduate status or 12 hours of 4000-level work.

5310. Early American Literature. 4. Seminar designed to acquaint graduate students with selected texts from the colonial period to 1800, relevant secondary works, and scholarly methods. *Prerequisite:* graduate status or 12 hours of 3000-4000 level work.

5320. Studies in 19c American Literature. 1-4 (Max. 8). A seminar designed to acquaint graduate students with selected principal works of American literature, relevant secondary works, and scholarly method. *Prerequisite:* graduate status of 12 hours or 4000-level work.

5330. Studies in 20c American Literature. 1-4 (Max. 8). A seminar in selected significant writers of poetry, drama, and prose from the end of the nineteenth century to the present. *Prerequisite:* graduate status or 12 hours of 4000-level work.

5340. Intellectual Currents in Modern American Literature. 1-4 (Max. 4). Devoted to the study of writers such as Marx and Freud and more recent American writers. *Prerequisite:* graduate status or 12 hours or 4000-level work.

5350. Global Literatures in English. 1-4 (Max. 8). Examines significant texts, authors, cultural and historical contexts, and literary and theoretical movements in postcolonial or global literatures. May involve comparative study or may be focused on a single country context. *Prerequisite:* graduate status or 12 hours of 4000-level work.

5360. Literatures of Diversity. 1-4 (Max. 8). A study of literature and culture of selected minority or marginalized communities. *Prerequisite:* graduate status or 12 hours of 3000-4000 level work.

5455. Slavery and Freedom. 1-4 (Max. 8). Students engage in an in-depth study of the literary voices that emerged from the history of enslavement in the Americas from colonial times through the end of Reconstruction in 1877. Dual listed with ENGL 4455; cross listed with AAST 5455. *Prerequisite:* graduate status or 12 hours of 3000-4000 level work.

5520. History of Literacy Criticism: Enlightenment and 19th Century. 4. Historical survey of the mainstream of European literary criticism, including the critics of antiquity and the Renaissance. *Prerequisite:* graduate status or 12 hours of 4000-level work.

5530. Modern Critical Theory and Practice. 1-4 (Max. 4). Major trends in modern poetics and practical criticism. *Prerequisite:* graduate status or 12 hours of 4000-level work.

5830. Victorian Women's Lives: Their Art, Literature, and Culture. 3. An interdisciplinary approach to the study of women's issues in art, using literary, cultural, and sociological texts to enlarge the art historical basis. Topics include "domestic goddess," class issues, racial questions, working women, prostitution, education, marriage, and divorce. Dual listed with ENGL 4830; cross listed with WMST 5830. *Prerequisites:* ART 2020, WMST 1080, ENGL 1080.

5880. Studies in Modern Fiction. 4. A study of modern fiction, examining theory and practice, and covering works of English, European, and American origin. *Prerequisite:* graduate status or 12 hours of 4000-level work.

5890. Consumption, Markets, Cultures. 1-4 (Max. 8). An interdisciplinary investigation of the ways in which cultural venues curate and market stories, history, and texts. Analyzes and applies theories and methodologies from literary and cultural tourism studies, as well as marketing and consumer culture, to museums, performances, tourist sites and theme parks. This class will include hands-on field research. *Prerequisite:* graduate status or 12 hours of 4000-level work.

5900. Practicum in College Teaching. 1-3 (Max. 4). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

5915. Tutorial. 1. Graduate standing or consent of instructor. One credit hour for fee purposes.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: Credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5965. Thesis Research II. 1-3 (Max. 3). Designed for students who have reached an advanced stage in the writing of the thesis. Also to inform students of professional genres and practices as well as academic and non-academic careers following the MA degree. *Prerequisites:* ENGL 5960 and enrollment in a graduate degree program.

5975. Independent Studies. 1-4 (Max. 6). Independent study and research experience in a given topic, person, or movement in literature at an advanced level. *Prerequisite:* permission of chair; graduate standing.
5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

Geography Program

122 Geology Building, (307) 766-3386

Web site: www.uwyo.edu/geography

Program Director: Carrick M. Eggleston

The Geography Program organization may be changing pending review.

Professor Emeritus:

John L. Allen, William L. Baker, Ronald E. Beiswenger, Thomas Buchanan, William J. Gribb, Deborah D. Paulson

The Geography Program is comprised of faculty with interests and expertise in geography, planning, and resource management. The program focuses upon the following:

1. The origin and nature of the physical and cultural environment, how the physical environment and its natural resources form, and how the environment and natural resources affect the quality of life.
2. The ways in which people and institutions affect natural resources and the environment.
3. The variety of methods and techniques with which we solve or prevent problems through the planning and management of natural resources.
4. The ways in which human institutions (e.g. political, economic, social) interact to produce diverse human landscapes.

Four Fundamentals of Geographic Learning

The Geography Program has identified four fundamental goals of geography to emphasize in its undergraduate curriculum. These four goals are at the intersection of topically important areas in the discipline of geography. We continue to evaluate student learning in our program to insure our curriculum addresses these fundamental goals as effectively as possible.

Goal 1 – Human-Environment Interaction

Students will be able to identify and explain how humans modify the environment and affect Earth’s biophysical systems through their human activities.

Goal 2 – Biophysical Systems

Students will be able to identify and explain an array of patterns, processes, and interactions in Earth’s biophysical systems occurring at different spatial scales.

Goal 3 – Human-Cultural Systems

Students will be able to identify and explain an array of patterns, processes, and interactions across Earth’s human landscapes at different spatial scales.

Goal 4 – Geographic Thought, Methods and Analysis

Students will understand basic geographic concepts and ideas, and will be capable of using them to inform their work. Students will also demonstrate the ability to select and use appropriate tools and techniques for addressing geographic problems and conducting geographic analysis. They will also be able to use multiple methods to examine, represent, and visualize Earth and its geographic characteristics.

Undergraduate Major

In addition to course work required by the university and the college, majors must complete 40 hours of program requirements, all of which must be completed with a grade of C or above, of which at least 15 credits will be 3000-4000 level Geography courses. All Geography degree students will complete a topical language requirement. Students completing a B.S. degree will need to complete two semesters of a computational or science language (computer programming language, mathematical language or science courses are acceptable) and one additional mathematical, statistical, or science class above the USP Q or PN requirement. Required courses (14 credit hours) include GEOG 1000, 1010, 1020, and 2150. In addition, students are required to complete 26 credit hours distributed over three of four content areas (Human Geography, Physical Geography, Geographic Information Science, and Natural Resource Management) with a minimum of one course in three different content area (to demonstrate breadth) and at least two courses in two content areas (to demonstrate depth). Students must declare to their academic advisor their preference of degrees prior to graduation. Students in the B.S. program must complete the following:

Core requirements:	14 hours
GEOG 1000 World Regional Geog.....	3
GEOG 1010 Intro to Physical Geography ...	4
GEOG 1020 Intro to Human Geog.....	3
GEOG 2150 Found of GIS & Tech.....	4

Content areas. 26 hours distributed among a minimum of three of the following areas with at least two courses in each of two areas:

- Human geography
- Physical geography
- Geographic information science
- Natural resource management
- Planning

Courses used to meet program requirements must be approved by the faculty advisor. The remaining credit hours needed for completion of the B.S. are elective credits (approximately 13-15).

B.S. Suggested Program of Study

FRESHMAN YEAR: Fall	Hrs.
GEOG 1000.....	3
USP First-Year Seminar.....	3
USP Communication I.....	3
USP Human Culture* ¹	4
USP Physical & Natural World.....	3
Total Hrs.	16

FRESHMAN YEAR: Spring	Hrs.
GEOG 1020.....	3
USP Human Culture*.....	4
A&S Core Diversity in the US.....	3
USP Physical & Natural World.....	4
Total Hrs.	14

SOPHOMORE YEAR: Fall	Hrs.
GEOG 1010.....	4
USP Communication II.....	3
USP Quantitative Reasoning.....	3
Electives.....	6
Total Hrs.	16

SOPHOMORE YEAR: Spring	Hrs.
GEOG 2150.....	4
Quantitative Reasoning Elective.....	3
Electives.....	9
Total Hrs.	16

JUNIOR YEAR: Fall	Hrs.
POLS 1000.....	3
Upper Division GEOG Content Area Course (GEOG 4200 recommended).....	3
Upper Division GEOG Content Area Course.....	3
Electives.....	6
Total Hrs.	15

JUNIOR YEAR: Spring	Hrs.
Upper Division GEOG Content Area Course (GEOG 3480 recommended).....	3
Upper Division GEOG Content Area Course.....	3
Electives.....	9
Total Hrs.	15

SENIOR YEAR: Fall	Hrs.
USP Communication III.....	3
Upper Division GEOG Content Area Course (GEOG 4051 recommended).....	3

Upper Division GEOG Content Area	
Course	3
Upper Division Electives	6
Total Hrs.	15

SENIOR YEAR: Spring	Hrs.
Upper Division GEOG Content Area	
Courses	9
Upper Division Electives	6
Total Hrs.	15
Total Credit Hours	122

* USP Human Culture: A single language must be taken for two semesters to fulfill the eight hour foreign language requirement for the program. Students taking American Sign Language to fulfill the language requirement of the major will have to take other courses to fulfill the USP H requirements.

¹Can substitute computer programming but it does not fulfill the USP H requirement; consult with an academic advisor.

Undergraduate Minor

The program offers a minor in geography. Credit requirements range from 18-20 hours of required and elective courses, all of which must be completed with a grade of C or above. Information on the minor program is available on the Geography Program website.

Environment and Natural Resources

The program offers a concentration in the university's interdisciplinary program, Environment and Natural Resources. A description of the concentration requirements is available online at the ENR website.

Graduate Study

The Geography Program offers coursework leading to the Master of Arts and Master of Planning degrees. Areas include: physical geography, natural resource management, spatial analysis, information, and display, and human geography. Areas in planning include: land use planning, environmental planning, and small town and rural planning.

Program Specific Admission Requirements

In addition to the minimum requirements set forth in this *Catalog*, applicants must submit a statement of academic and professional goals. Applicant evaluations are based on GRE score, undergraduate G.P.A. and 3 letters of recommendation. Undergraduate deficiencies, identified by the candidate and advisor, can be remedied during the degree program.

Program Specific Graduate Assistantships

Graduate assistantships are available as both teaching and research assistantships. Applicants for graduate assistantships must submit their completed materials to the program graduate coordinator by February 15th prior to the fall semester for which they are seeking the assistantship. Students already in the program as well as new applicants for admission may apply for graduate assistantships. Assistantship duties will be determined following the award and acceptance of the student.

Program Specific Degree Requirements

Incoming students must have a minimum undergraduate background equivalent to 15 semester hours in college-level geography courses to include 3 hours each in maps and mapping, human geography, and physical geography. Planning students may use undergraduate course work in planning, analytic tools, regional science, or other relevant subject matter to meet the undergraduate requirement. Deficiency courses prescribed by the faculty advisor do not count toward graduate program requirements, and must be taken for credit and for a grade (not S/U).

All Master Degrees (Plan A Thesis)

Thirty credit hours of approved course work (not including thesis research), a minimum of four hours of thesis research, and completion of a thesis.

Core Requirements - All Programs:

GEOG 5000 Research Perspectives	3
GEOG 5001 Research in Geography	
Colloquium	2
GEOG 5002 Geography Graduate	
Seminar	1
Students will successfully complete at least two techniques courses totaling six or more credit hours. These may be selected from the list below. Alternatively, students may discuss with their advisor techniques courses that more appropriately support their program of study and research plans.	
GEOG 4200 Introduction to Geographic Information Sciences	4
GEOG 5111 Remote Sensing of the Environment/Lab	4
GEOG 5210 Advanced Geographic Information Systems	4
GEOG 5220 Spatial Modeling	4
GEOG 5455 Remote Sensing of Rivers	3
GEOG 5050 Environmental Data Management	4

STAT 5000 Statistical Analysis for Research Workers	3
STAT 5070 Statistical Methods for the Social Sciences	3
STAT 5210 Statistical Methods	3
AMST 5800 Historical Preservation	3
SOC 5100 Advanced Social Research Methods	3
GEOL 5446 Introduction to Geostatistics	3

All students must complete a thesis which shall be an original contribution to knowledge. The student graduate committee will be composed of a minimum of two Geography faculty, with one serving as chairperson, and at least one faculty member from outside the Geography Program. All students must prepare a thesis proposal for submission to their committee and have committee approval to initiate research on their thesis and must successfully complete an oral defense of their thesis. The student's committee may also require a written examination.

Master of Arts in Geography

Students must fulfill all requirements listed above.

Master of Planning

Core courses (12 hours)	
GEOG 4310 Foundations of Sustainable Planning	3
POLS 5510 Public Policy and Program Management	3
GEOG 5325 Legal Aspects of Planning	3
GEOG 5330 Land Use Planning	3
Analysis courses: (three courses - 9 hours)	
Statistics: (one course - 3 hours)	
Techniques: (two courses - 6 hours)	
Elective courses:	
15 hours of elective course work in planning areas: land use, natural resource, or small town and rural area approved by faculty advisor.	

Students completing the Plan A option are required to complete a minimum of 4 hours of thesis research.

Students completing the Plan B are required to complete a minimum of 4 hours of geographic research writing and two papers from the areas of planning: land use, natural resource, or small town and rural area.

Master of Arts in Geography/Water Resources Core Requirements:

GEOG 5000 Research Perspectives	3
GEOG 5450 Fluvial Geomorphology	4
REWM 4700 Wildland Watershed Management	3
OR	
REWM 4285 Wildland Hydrology	3

In completing core methods requirements students may also choose GEOG 5111, Remote Sensing of the Environment (4), or GEOG 4455/5455, Remote Sensing of Rivers (3). Additional course requirements include one class from the Technical Hydrology and/or Water Quality lists for the Interdisciplinary MS Program in Hydrology & Water Resources (WARE) program and one course from the Law and Natural Resource Economics list.

Technical Hydrology Water Quality Course

Requirement (at least one of the following):

CE 4800 Hydrology3
 CE 5435 Environmental Transport Processes3
 CE 5445 Hazardous Waste Site Remediation3
 CE 5810 Ground Water Hydrology.....3
 CE 5860 Soil Erosion and Conservation3
 CE 5870 Water Resources Engineering3
 CE 5880 Advanced Hydrology3
 GEOL 5444 Geohydrology3
 GEOL 5550 Numerical Methods in Ground Water Geology I.....3
 GEOL 5570 Advanced Geohydrology3
 REWM 4700 Wildland Watershed Management3
 REWM 5280 Stream Habitat Management..3
 REWM 5285 Wildland Hydrology.....3
 SOIL/MATH 5110 Modeling Flow Transport in Soil and Groundwater Systems4
 BOT 5740 Ecosystems Analysis4
 CE 4410 Environmental Engineering Chemistry3
 CE 4400 Design of Water Treatment Facilities3
 CE 5410 Advanced Biological Wastewater Treatment3
 CE 5450 Advanced Physical/Chemical Water Treatment Processes3
 GEOL 4490 Geochemistry3
 GEOL 5450 Water Quality Modeling3
 GEOL 5777 Geochemistry of Natural Waters3
 REWM 5710 Watershed Water Quality Management.....3
 SOIL 5130 Chemistry of the Soil Environment4
 ZOO 4440 Limnology3
Law and Natural Resource Economics Course Requirement (at least one of the following):
 AGECE 4710 Natural Resource Law and Policy3

AGECE 4720 Water Resource Economics.....3
 AGECE 5630 Advanced Natural Resources Economics3
 ECON 4400 Environmental Economics3
 ECON 4410 Natural Resources Economics3
 ECON 5400 Advanced Resource & Environmental Economics.....3
 LAW 6660 Environmental Law.....3
 LAW 6860 Water Rights.....3

Plan B (Non-Thesis)

Thirty credit hours of approved course work (not including geographic research writing credit), a minimum of four hours of research writing credit, and the completion of two professional research papers.

Core Requirements - All Programs:

GEOG 5000 Research Perspectives3
 GEOG 5001 Research in Geography Colloquium2
 GEOG 5002 Geography Graduate Seminar1
 Students will successfully complete at least two techniques courses totaling six or more credit hours. These may be selected from the list below. Alternatively, student may discuss with their advisor techniques courses that more appropriately support their program of study and research plans.
 GEOG 4200 Introduction to Geographic Information Systems.....3
 GEOG 5111 Remote Sensing of the Environment/Lab.....4
 GEOG 5210 Advanced Geographic Information Systems.....4
 GEOG 5220 Spatial Modeling4
 GEOG 5455 Remote Sensing of Rivers.....3
 GEOG 5050 Environmental Data Management.....4
 STAT 5070 Statistical Methods for the Social Sciences3
 STAT 5210 Statistical Methods.....3
 AMST 5800 Historical Preservation.....3
 SOC 5100 Advanced Social Research Methods3
 GEOL 5446 Introduction to Geostatistics ..3

All students must have committee approval to initiate research on their professional papers and must successfully complete an oral defense of their professional papers. The student's committee may also require a written examination.

Geography (GEOG)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1000 [G&R 1000]. World Regional Geography. 3. [CS,G◀▶H] Covers the distributions, traits, and processes of the Earth's peoples and landscapes through the perspective of regional geography, which is the study of the spatial relationships of natural environments and human societies. Cross listed with: INST 1060.

1010 [G&R 1010]. Introduction to Physical Geography. 4. [SE◀▶PN] Systematically studies natural aspects of geographic environments, including weather and climate, landforms, soils and vegetation. Lab fee required.

1020 [G&R 1020]. Introduction to Human Geography. 3. [CS,G◀▶H] Analyzes spatial patterns of and interaction between the world's great cultural systems. Includes settlement patterns, behavioral patterns, agricultural land use and resource utilization.

1101. First-Year Seminar. 3. [(none)◀▶FYS]

2150 [G&R 2150]. Foundations of Geo Information Science and Technology. 4. [L◀▶(none)] Overviews the role of geographic information and technology in modern society. Includes discovery and accessing geospatial data and information for both research and enjoyment, with an emphasis on reading and analyzing maps and visualizations to support geographical reasoning. Lab provides hands-on experience working with maps and related geographic information technologies.

2370. Chicano History: Origins to 1900. 3. [CS,D◀▶H] General survey that traces the geographic distribution and historical processes that have shaped the life experiences, socio-economic development and cultural contributions of peoples of Mexican descent in the United States from their indigenous and Hispanic origins to the end of the 19th century. Cross listed with LTST/HIST 2370.

2550 [G&R 2550]. Recreation and Natural Resources. 3. Introduces outdoor recreation agencies and programs; supply and demand for outdoor recreation resources; and relationship of recreation to the conservation of natural resources.

3010 [G&R 3010]. Geomorphology of Earth's Dynamic Landscapes. 3. A Systematic exploration of Earth's surface, emphasizing the geographic distribution of various landforms and their evolution over time. Introduces general geomorphic principles and describes the application of these principles to specific landscape features. The processes that drive landscape change are examined through

case studies, computer-based mapping exercises, and basic calculations. *Prerequisite:* Either GEOG 1010 or GEOL 1500 or equivalent.

3030 [G&R 3030]. Geography and Development. 3. [CS,G♦(none)] Examines distribution of wealth and poverty in the world; theories of development, from traditional modernization theories through Marxist critiques and sustainable development; and case studies from around the world of development successes and failures, chosen to illustrate and illuminate theories of development. *Prerequisite:* GEOG 1000 or 1020 or 9 credit hours of social science with global focus.

3050 [G&R 3050]. Economic Geography. 3. Economic Geography is the study of the location, distribution and spatial organization of economic activities across the globe; specifically how the economic realm is intertwined with other spheres of international social life. It explores the inherent logics and mechanisms of the capitalist system, and the social and spatial inequalities that result. *Prerequisite:* 6 hours of Social Sciences or International Studies.

3280. Spatial Methods. 4. [(none)♦COM3] Introduction of statistical methods for the analysis of geo-spatial data; point, line/network, and areal units. The application of quantitative measurements to examining the spatial relationship of physical and socio-economic factors in problem-solving. *Prerequisites:* at least one geography course and completion of either STAT 2010, 2050, or 2070.

3400. Traditional Ecological Knowledge. 3. [CS,D♦(none)] Description of the interaction between economy, religion, language and the ecosystem for select indigenous peoples and discussion of the pedagogical methods for preserving their ecological knowledge. An examination of the conflict between contemporary society's demands and preserving traditional society's heritage. Cross listed with NAIS 3400. *Prerequisite:* one course in American Indian culture.

3450 [G&R 3450]. Weather and Climate. 3. Systematically examines elements and controls of weather and climate with application to regions. Cross listed with ENR 3450. *Prerequisite:* GEOG 1000, 1010 or 1020.

3480 [G&R 3480]. Environmental Change. 3. [WB,G♦(none)] Examines changes in the bio-physical environments and landscapes of Earth during its habitation by humans. Emphasizes integrated approaches to understanding environmental changes based on climatological, ecological, geological, archeological, and historical evidence. Explores how humans have modified Earth's environments and how societies have responded to natural and

anthropogenic environmental change. Cross listed with ESS 3480. *Prerequisites:* GEOG 1010 or any USP PN course and USP COM1.

3550 [G&R 3550]. Natural Hazards and Society. 3. [CS♦(none)] Considers societal structures and processes as they interact with hazards in the natural environment.

4000 [G&R 4000]. Terrain Analysis. 3. Studies techniques for acquiring and analyzing spatial data from maps, remotely sensed imagery and field surveys for landscape assessment. Emphasizes deriving maps that describe physical suitability of landscapes for specific human activities. Field trip required. *Prerequisite:* Completion of USP PN requirement or consent of instructor.

4013. Political Geography. 3. Geographic space is subdivided into political units to aid human interaction and to facilitate political processes. Examines the spatial organization of political space and its effects upon political processes at varying geographic scales ranging from the local to international. Dual listed with GEOG 5013; cross listed with POLS 4013. *Prerequisite:* Completion of USP H requirement.

4020 [4420]. Geography and Tourism. 3. Studies concepts, methods, conflicts and opportunities of national and international tourism. Emphasizes recreation and the environment. *Prerequisites:* GEOG 1010 or GEOG 1000 or GEOG 1020 or consent of instructor.

4040 [G&R 4040]. Conservation of Natural Resources. 3. [CS♦(none)] Geographically analyzes conservation of natural and human resources, as well as political, social and ethical ramifications of our environmental policy. Cross listed with ENR 4040. *Prerequisite:* 6 hours of geography or ENR.

4051 [G&R 4051]. Environmental Politics. 3. Analyzes environmentalism as a political phenomenon. Provides students with a basic understanding of how to analyze political issues by: (1) examining the historical and contemporary issues that produce controversy over environmental matters; and (2) surveying the impacts of these issues on the formulation and implementation of laws, policies, and regulations. Cross listed with AMST, ENR, POLS and REWM 4051. *Prerequisite:* POLS 1000.

4052 [G&R 4052]. Federal Land Politics. 3. Examines the political forces that have shaped and continue to shape federal land policy and management. Explores the interactions between democratic decision making and science in the management of federal lands. Surveys the sources of controversy over federal land management and methods for harmonizing public demands with technical expertise. Cross listed with POLS/ENR/AMST/REWM 4052. *Prerequisite:* POLS 1000.

4080 [G&R 4080]. Management of Major River Basins. 3. Examines geography of water resources, including distribution, water as a resource and water as a hazard to humans. Focuses on water management case studies on the scale of major river basins in North America and elsewhere in the world. *Prerequisite:* Completion of the USP PN requirement or consent of instructor.

4113. Geological Remote Sensing. 4. Acquaints students with aircraft and spacecraft remote sensing of the environment, emphasizing geologic application to earth and other planetary bodies. Includes visible, infrared, ultraviolet, radio and radar sensing. Laboratory exercises are applications related to tectonics, geomorphology, paleoclimate, structure, stratigraphy, environmental geology and geologic hazards. Cross listed with GEOL 4113. *Prerequisites:* GEOL 1005 or 1100 or 1200 or GEOG 1010 and MATH 1400/1405 or MATH 1450.

4200 [G&R 4200]. Introduction to Geographic Information Systems. 4. Fundamental concepts, theories and applications in geographic information systems and science. *Prerequisite:* GEOG 2150.

4210 [G&R 4210]. Advanced Geographic Information Systems. 4. Advanced study of programs, data structures, and techniques for spatial data display and analysis. Dual listed with GEOG 5210. *Prerequisite:* GEOG 4200.

4220. Spatial Modeling and Geocomputation. 4. Examines the theory and development of models of spatial patterns and process. Modeling these systems often required techniques not readily available in a GIS environment. Examines GIS and geocomputational methods to solve these problems as well as issues related to error, representation, and scale. Dual listed with GEOG 5220. *Prerequisite:* GEOG 4200 or GEOG 4210 or consent of instructor.

4310 [G&R 4310]. Foundations of Sustainable Planning. 3. Description and analysis of planning that involves a citizen involvement process to determine the future direction of a community or region. Sustainability concepts are described to provide a framework for social equity, environmental protection, and economic longevity, the fundamental elements of a community or regional comprehensive plan. Dual listed with GEOG 5310. *Prerequisite:* junior standing.

4325 [G&R 4325]. Legal Aspects of Planning. 3. Review of the U.S. Constitution, federal and state laws and statutes, and pertinent court cases that directly relate to planning policy at the federal, state and local level. Examination of the legal system to provide services and protect the health, safety, and welfare of

citizens with regard to private property rights. Dual listed with GEOG 5325. *Prerequisite:* junior standing, USP V course.

4330 [G&R 4330]. Land Use Planning. 3. Advanced study of processes expressed as a specific activity on the land. An examination and analysis of the interacting environmental, economic, and social factors that produce the land activity. Dual listed with GEOG 5330.

4340 [G&R 4340]. Natural Resource Management on Western Reservations. 3. Designed to examine natural resource management techniques on western reservations. Topics to be discussed will focus on the management and planning of water, grazing, extractive industries and forestry. Field work on the Wind River Indian Reservation is a part of the class. Cross listed with NAIS 4340. *Prerequisite:* 6 hours of 2000-level NAIS classes.

4370 [G&R 4370]. Environmental Planning. 3. A planning-oriented approach to ecosystems theory based on the federal/legal regulatory foundation. An examination of scientific and alternative perspectives on the comparative dynamics of natural and human-oriented ecosystems and implementing strategies. Dual listed with GEOG 5370.

4390 [G&R 4390]. Rural & Small Town Planning. 3. A single community planning problem is assigned. Student teams play the role of community planning staff. Teams experience defining community goals; communicating with others about these goals and problem perceptions; accomplishing necessary research; generating various solutions to problems they have perceived; selected from among these solutions, and formulating a single, integrated, comprehensive plan and documenting the plan and rationale behind it. Dual listed with GEOG 5390. *Prerequisite:* work at the 4000-level in one or more of the four substantive areas, and/or consent of the instructor.

4400 [G&R 4400]. Natural Resource Policy. 3. Encompasses administrative policies and programs relating to natural areas. Emphasizes the national park system. *Prerequisite:* GEOG 4750.

4440. Advanced Global Climate Variability. 3 (max. 9). Climate varies. This fundamental aspect of the climate system can have major environmental and societal impacts to ecosystems, the hydrologic cycle and water resource management in arid environments such as the intermountain west. This course will utilize climate data and mapping tools to understand global and regional climate variability. Dual listed with GEOG 5440. *Prerequisite:* GEOG/ENR 3450 or instructor's consent.

4450 [G&R 4450]. Fluvial Geomorphology.

4. A systematic examination of rivers and related land forms. Emphasizes understanding how processes of flow and sediment transport influence channel form and behavior. Considers rivers systems across a range of scales, from movement of individual sediment particles to organization of continental drainage basins. Explores connections to aquatic ecosystems and human impacts. Dual listed with GEOG 5450. *Prerequisites:* GEOG 3010 or GEOL 2100 or GEOL 2150 or consent of instructor.

4455. Remote Sensing of Hydrologic Systems. 4. Explores the application of remote sensing data and techniques to the study of the hydrological systems and introduces the physical principles that enable the different elements of the hydrological system to be inferred from different types of image data and analysis. Dual listed with GEOG 5455. *Prerequisites:* junior standing and one prior course in remote sensing.

4460 [G&R 4460, 3460]. Biogeography. 3. A systematic study of the distribution of plants and animals, communities and ecosystems, the processes that produce patterns of distribution and their change over time. Interactions of climate, soil geomorphology, biota and human activities are emphasized. *Prerequisites:* junior standing and GEOG 1010 or LIFE 2022 or 2023.

4470 [G&R 4470]. Fire Ecology. 3. Natural and human-caused fires are an important phenomenon affecting ecosystems and human communities throughout the world. Explores the geography, ecology, and management of fires. Dual listed with GEOG 5470. *Prerequisite:* GEOG 4460, BOT 4700, LIFE 3400 or graduate standing.

4500 [G&R 4500]. The American Landscape. 3. Provides a basis for interpreting the nature and content of the contemporary landscapes of the United States by viewing those landscapes in the process of creation and change and investigates the relationship between landscape and American environmental attitudes. Students are introduced to research techniques and methodologies in historical geography. *Prerequisite:* Completion of USP H requirement or consent of instructor.

4502. Images of Wyoming and the West. 3. The West is nothing more than a barren, desolate landscape to some while to others it offers great spiritual and cultural significance. Examines how individuals and groups perceive Wyoming and the West, how such perceptions have been constructed over time, and how these differing views create images of the

region both real and imagined. Dual listed with GEOG 5502. *Prerequisite:* GEOG 1000 or GEOG 1020 and junior standing.

4550. Geography of Wine. 3. Examine the regional influence of climate, terrain and cultural characteristics on the production of grape varieties and demonstrate the implications of this influence on the location and distribution of wines produced. Discussion will focus on the world-wide production and consumption of wine and impacts of multi-national corporations. *Prerequisites:* junior standing and at least 21 years of age.

4560. Global Cities. 3. Globalization accelerates urbanization processes and creates a new type of city: the global city. This course investigates the debates over global cities, urban culture, new urban landscapes, urban planning practices, and social disparity. Using case studies from around the world, this class explores the diversity of global city formation processes. Dual listed with GEOG 5560; cross listed with INST 4560. *Prerequisites:* 9 hours of international studies or geography.

4570. Cultural Geography. 3. Cultural Geography is an overview in qualitative cultural landscape studies. The course emphasizes what a cultural landscape is, how it can be examined, and what can be learned from such landscapes. Students are exposed to readings in cultural geography from a wide array of viewpoints with an emphasis placed on classic works. Dual listed with GEOG 5570. *Prerequisite:* GEOG 1000 or GEOG 1020 and junior standing.

4580 [4572]. Sense of Place. 3. Examines how individuals and groups perceive specific geographic locations, how such perceptions are constructed, and how these differing views and feelings play out in our everyday. Dual listed with GEOG 5580. *Prerequisites:* Completion of USP H requirement or consent of instructor.

4590 [4574]. Geography of Conflicts. 3. Explores the representation of place and how various groups often have differing views of how a place should be represented and/or thought of. Various local representations of contested land use, group place identity, and personal place identity are discussed. Dual listed with GEOG 5590. *Prerequisite:* Completion of USP H requirement or consent of instructor.

4875 [G&R 4875, 4950]. Independent Studies. 1-6 (Max. 6). Considers current research topics in consultation with faculty member. Dual listed with GEOG 5875. *Prerequisite:* 9 hours in subject area of topic of current research.

4880 [G&R 4880, 4850]. Current Topics. 1-6 (Max. 9). Special course on a topic of current interest. Dual listed with GEOG 5880. *Prerequisite:* junior standing.

4885 [G&R 4885, 4900]. Seminar: _____. **1-3 (Max. 6).** Faculty-student discussion, reading, and study focused on a selected topic and interest. *Prerequisite:* GEOG 4750.

4960 [4860, G&R 4860]. Field Studies. 1-6 (Max. 6). Intensive introduction to field methods used in geographic research in one or more of the subdivisions of geography.

4965 [4865, G&R 4865]. Directed Studies/Research Problems. 1-6 (Max 6). Intensive introduction to methods used in geographic research. *Prerequisites:* consent of instructor and at least 12 hours in geography.

4990 [4870, G&R 4990]. Internship/Practicum. 1-6 (Max. 12). Experience in applying student skills and training in an agency, organization, or business. Offered for S/U only. Dual listed with GEOG 5990. *Prerequisites:* for majors only, minimum of 12 hours in the major, junior standing and consent of the instructor.

5000. Research Perspectives. 3. Focuses upon the historical development, heritage and topical breadth of geography. Special emphasis is given to the changing approaches and philosophies for conducting research in geography. *Prerequisite:* graduate standing.

5001. Research in Geography Colloquium. 2. Colloquium series and discussion to review and critique examples of current research in geography and allied disciplines. This course builds on the theoretical and philosophical foundations from Research Perspectives. *Prerequisite:* GEOG 5000 and graduate standing.

5002. Geography Graduate Seminar. 2. Research seminar providing third-semester graduate students a public and formal opportunity to present their research. *Prerequisite:* GEOG 5001.

5013. Political Geography. 3. Geographic space is subdivided into political units to aid human interaction and to facilitate political processes. Examines the spatial organization of political space and its effects upon political processes at varying geographic scales ranging from the local to international. Cross listed with POLS 5013; dual listed with GEOG 4013. *Prerequisite:* graduate standing.

5050. Techniques in Environmental Data Management. 4. Centers on the role of information technology in support of scientific research. Through integration of multiple software packages (e.g. Relational databases, ProgramR and ArcGIS), proven database designs, and SQL scripting, increased efficiency and utility will occur during data analyses.

These information science principles are demonstrated using project-based examples. Cross listed with ECOL/ENR 5050. *Prerequisite:* graduate standing.

5060. Landscape Ecology. 3. A study of structure, function, and change in the biosphere on the scale of kilometers. Includes a consideration of the effects of human land uses, natural disturbances, and other processes on landscapes. *Prerequisite:* GEOG 4460 or LIFE 3400 or BOT 4700.

5210. Advanced Geographic Information Systems. 4. Advanced study of programs, data structures, and techniques for spatial data display and analysis. Dual listed with GEOG 4210. *Prerequisites:* GEOG 4200 or equivalent and graduate standing.

5220. Spatial Modeling and Geocomputation. 4. Examines the theory and development of models of spatial patterns and process. Modeling these systems often requires techniques not readily available in GIS environment. Examines GIS and geocomputational methods to solve these problems as well as issues related to error, representation, and scale. Dual listed with GEOG 4220. *Prerequisite:* GEOG 4200/4210.

5310. Foundations of Sustainable Planning. 3. Description and analysis of planning that involves a citizen involvement process to determine the future direction of a community or region. Sustainability concepts are described to provide a framework for social equity, environmental protection, and economic longevity, the fundamental elements of a community or regional comprehensive plan. Dual listed with GEOG 4310.

5325. Legal Aspects of Planning. 3. Review of the U.S. Constitution, federal and state laws and statutes, and pertinent court cases that directly relate to planning policy at the federal, state and local level. Examination of the legal system to provide services and protect the health, safety, and welfare of citizens with regard to private property rights. Dual listed with GEOG 4325. *Prerequisite:* graduate standing.

5330. Land Use Planning. 3. Advanced study of processes expressed as a specific activity on the land. An examination and analysis of the interacting environmental, economic, and social factors that produce the land activity. Dual listed with GEOG 4330. *Prerequisite:* graduate standing.

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of natural and human-oriented ecosystems and implementing strategies. Dual listed with GEOG 4370. *Prerequisite:* graduate standing.

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5440. Advanced Global Climate Variability. 3. Climate varies. This fundamental aspect of the climate system can have major environmental and societal impacts to ecosystems, the hydrologic cycle and water resource management in arid environments such as the intermountain west. This course will utilize climate data and mapping tools to understand global and regional climate variability. Dual listed with GEOG 4440. *Prerequisites:* GEOG/ENR 3450 or equivalent and graduate standing.

5450. Fluvial Geomorphology. 4. A systematic examination of rivers and related land forms. Emphasizes understanding how processes of flow and sediment transport influence channel form and behavior. Considers rivers systems across a range of scales, from movement of individual sediment particles to organization of continental drainage basins. Explores connections to aquatic ecosystems and human impacts. Dual listed with GEOG 4450. *Prerequisites:* GEOG 3010 or GEOL 2100 or GEOL 2150 or equivalent and graduate standing.

5455. Remote Sensing of Hydrologic Systems. 4. Explores the application of remote sensing data and techniques to the study of the hydrological systems and introduces the physical principles that enable the different elements of the hydrological system to be inferred from different types of image data and analysis. Dual listed with GEOG 4455. *Prerequisite:* graduate standing.

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Wyoming and the West, how such perceptions have been constructed over time, and how these differing views create images of the region both real and imagined. Dual listed with GEOG 4502. *Prerequisite:* GEOG 1000 or GEOG 1020 or equivalent and graduate standing.

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5570. Cultural Geography. 3. Cultural Geography is an overview in qualitative cultural landscape studies. The course emphasizes what a cultural landscape is, how it can be examined, and what can be learned from such landscapes. Students are exposed to readings in cultural geography from a wide array of viewpoints with an emphasis placed on classic works. Dual listed with GEOG 4570. *Prerequisite:* GEOG 1000 or GEOG 1020 or graduate standing.

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5590 [5574]. Geography of Conflicts. 3. Explores the representation of place and how various groups often have differing views of how a place should be represented and/or thought of. Various local representations of contested land use, group place identity, and personal place identity are discussed. Dual listed with GEOG 4590. *Prerequisite:* GEOG 1000 or GEOG 1020 or graduate standing.

5790. Research Methods. 1-3 (Max. 9). Introduction to the methodology of empirical research in related fields for advanced students. *Prerequisites:* 12 credit hours in GEOG, graduate standing, and consent of instructor.

5875. Independent Study. 1-6 (Max. 6). Considers current research topics in consultation with faculty member. Dual listed with GEOG 4875. *Prerequisite:* 9 hours in subject area of topic of current research.

5880. Current Topics. 1-9 (Max. 9). Special course on a topic of current interest. Dual listed with GEOG 4880. *Prerequisite:* junior standing.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: Credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrollment in a graduate degree program.

5990. Internship/Practicum. 1-12 (Max. 12). Experience in applying student skills and training in an agency, organization, or business. Offered for S/U only. Dual listed with GEOG 4990. *Prerequisite:* graduate standing.

Geology and Geophysics

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SUBHASHIS MALLICK, B.S. Indian Institute of Technology 1976; M.S. 1978; Ph.D. University of Hawaii 1987; Professor of Geology and Geophysics and the School of Energy Resources 2008.

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Associate Professors:

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KENNETH G. DUEKER, B.A. Whitman College 1984; Ph.D. University of Oregon 1994; Associate Professor of Geophysics 2006, 2000.

DARIO GRANA, B.S. University of Pavia 2003; M.S. 2005; M.S. University of Milano Bicocca 2006; M.S. Stanford University 2013; Ph.D. 2013; Associate Professor of Geology and Geophysics and the School of Energy Resources 2019, 2013.

JOHN KASZUBA, B.S. Beloit College 1982; M.S. Virginia Polytechnic Institute & State University 1986; Ph.D. Colorado School of Mines 1997; Associate Professor of Geology and the School of Energy Resources 2008, 2012.

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TOM A. MINCKLEY, B.S. Northern Arizona University 1987; University of Arizona 1996; M.A. University of Oregon; Ph.D. 2003; Associate Professor of Geology 2014, 2012.

CLIFFORD S. RIEBE, B.S.E. University of Michigan 1992; Ph.D. University of California-Berkeley 2000; Associate Professor of Geology 2014, 2008.

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Assistant Professors:

JAMES CHAPMAN, B.S. College of William and Mary, 2003; M.S. University of Texas at El Paso, 2008; Ph.D. University of Arizona, 2018; Assistant Professor of Geology and Geophysics 2018.

KIMBERLY LAU, B.S. Yale University 2009; Ph.D. Stanford University 2017; Assistant Professor of Geology and Geophysics 2019.

ANDREW PARSEKIAN, B.S. Dickinson College 2005; Ph.D. Rutgers University 2011; Assistant Professor of Geology and Geophysics 2013.

SIMONE RUNYON, B.S. Illinois State University 2007; M.S. University of Arizona; Ph.D. 2017; Assistant Professor of Geology and Geophysics 2018.

Research Scientists:

BRADLEY CARR, B.S. University of Wisconsin-Madison 1987; Ph.D. University of Wyoming 1995; Assistant Research Scientist Senior 2017, 2013.

KEVIN R. CHAMBERLAIN, B.A. Colgate University 1979; Ph.D. Washington University 1990; Research Professor 2004, 1990.

JANET C. DEWEY, B.S. Mississippi State University 1990; M.S. Auburn University; Associate Research Scientist 2017, 2011.

SUSAN SWAPP, B.A. Indiana University 1977; M.S. Yale University 1978; M.Ph. 1979; Ph.D. 1982; Senior Research Scientist 1994.

Adjunct Professors:

Vladimir Alvarado, Erin Campbell-Stone, Eric Erslev, Warren B. Hamilton, Peter H. Hennings, W. Steven Holbrook, Ranie Lynds, Laura Vietti

Professors Emeriti:

Donald W. Boyd, James I. Drever, William E. Frerichs, B. Ronald Frost, Robert Houston, Robert R. Howell, Jason A. Lillegraven, Ronald W. Marrs, Randi Martinsen, James E. McClurg, Scott B. Smithson, Arthur W. Snoke, Ronald C. Surdam

Geology is the study of the origin, history and structure of the earth. Our undergraduate offerings encompass virtually every aspect of the science, with emphasis on current theory, methods and applications. The philosophy of the department is to provide sound training in both theory and field observation, and to couple this background with a thorough education in modern laboratory, quantitative and field techniques required for an understanding of geologic processes.

The setting of the university in the Rocky Mountains is ideal because some of North America's most outstanding geologic features

are within a short drive of campus. The semi-arid climate in Wyoming has resulted in excellent exposures of diverse rock types ranging in age from Precambrian to Recent. Deformation of the rocks in the region has been extensive, affording the student a field laboratory that exhibits a wide diversity of styles of faulting and folding. Mineral deposits, petroleum resources and coal abound in the region.

Undergraduate Majors

The Bachelor of Science in geology is designed for those students who intend to become professional geologists and/or those who plan to attend graduate school in geosciences. The program includes courses normally expected of graduate school applicants, including a summer field camp and courses in related sciences and mathematics. This degree program prepares students for the examination for the professional geologist license.

The Bachelor of Arts in geology and Earth sciences is specifically designed for undergraduates who wish to study Earth sciences as a foundation for careers in a variety of areas, such as environmental law, natural resource business, land use planning, Earth science education, science journalism, and many governmental positions. The B.A. program includes a broad spectrum of courses, and focuses both on information about the Earth and on how society makes decisions that affect the Earth system.

The Bachelor of Science in Environmental Geology and Geohydrology is designed for those students who intend to become professionals in environmental fields such as consulting, site assessment, hazard assessment, and remediation. The degree will prepare students for graduate school in environmental disciplines and for entry-level jobs.

Majors in any of the degree programs above may also choose to declare an affiliated degree with the School of Environment and Natural Resources by completing degree requirements for both degrees. Students should consult the section on the School of Environment and Natural Resources.

The Department of Geology and Geophysics also participates in the Earth System Science interdisciplinary program by offering a concentration in geology for the B.S. degree in ESS. Students interested in this major should consult the section on Earth System Science for curriculum requirements.

**Geology Program Objectives:
Bachelor of Science**

The primary mission of our B.S. geology program is to provide a quality educational experience that prepares men and women to enter careers in geology and related fields. We expect that our graduates should:

- Have the basic knowledge and skills demanded for entry-level competence in typical careers in earth science.
- Be able to apply basic scientific and technical knowledge to specific tasks and problems.
- Cultivate the specific scientific and technical skills that will allow them effectively to serve their employers and to enhance their own career development.
- Develop increased capacity in the skills of independent learning, critical thinking, problem definition, and problem solving.
- Develop enhanced numerical skills and computer literacy as part of an undergraduate program designed to deliver a current and relevant knowledge of their discipline.
- Communicate effectively and professionally through oral, written, and graphical means and to participate effectively in their workplace and in individual and team-related activities.
- Have the broad general education needed to appreciate the role of Earth Sciences in the societal context and appreciate the importance of ethics in the practice of the profession.

Geology Program Goals: Bachelor of Science

The department of Geology and Geophysics has the following specific goals for its B.S. program:

- Students in the B.S. program will receive a quality preparatory education in the discipline that is current, relevant, practical, and personal.
- B.S. students who graduate with appropriate grades will be able to compete successfully for positions at graduate schools nationwide.
- B.S. students who graduate with appropriate grades will be well prepared for entry-level positions as professionals within their and other related disciplines.

Geology Program Objectives: Bachelor of Arts

The primary mission of our B.A. geology program is to provide a broad educational experience that prepares men and women for careers in earth science-related fields. We expect that our graduate should:

- Have the basic knowledge and skills demanded for entry-level competence in typical careers in earth science related fields.
- Be able to apply their knowledge to specific situations or problems.
- Cultivate the skills and ethics that will allow them effectively to serve their employers and to enhance their own career development.
- Develop increased capacity for independent learning, critical thinking, and problem solving.
- Develop basic numerical skills and computer literacy as part of an undergraduate program designed to deliver a current and relevant knowledge of their discipline.
- Communicate effectively and professionally through oral, written, and graphical means and to participate effectively in the work environment, both in individual and team-related activities.
- Have the broad general education needed to appreciate the role of Earth Sciences in the societal context and appreciate the importance of ethics in the practice of the profession.

Geology Program Goals: Bachelor of Arts

The department of Geology and Geophysics has the following specific goals for its B.A. program:

- Students in the B.A. program will receive a broad preparatory education in earth science and related fields that is current, relevant, practical, and personal.
- B.A. students who graduate with appropriate grades will be able to compete successfully for positions at graduate schools nationwide.
- B.A. students who graduate with appropriate grades will be well prepared for entry-level positions in the geosciences and other related disciplines.

Required Academic Performance

In order to graduate with a Bachelor of Science or Bachelor of Arts degree in geology, the student must earn a letter grade of C (S where appropriate) or better in each course listed herein as part of the required course programs. This grade requirement applies to course work taken outside the department, as well as to transfer courses credited in lieu of resident requirements.

Bachelor of Science Curriculum Geology Program

I. Required Courses Hrs.

One of the following:

GEOL 1005 Earth History or.....	4
GEOL 1100 Physical Geology or.....	4
GEOL 1200 Historical Geology or.....	4
GEOL 1500 Water, Dirt, Climate.....	4

And each of the following:

GEOL 2000 Geochemical Cycles & Earth Systems.....	4
GEOL 2005 Introduction to Geophysics or GEOL 3005 Principles of Geophysics.....	4
GEOL 2010 Mineralogy.....	3
GEOL 2020 Petrology.....	2
GEOL 2100 Stratigraphy & Sedimentation..	4
GEOL 4610 Structural Geology & Tectonics.....	4
GEOL 4717 Field Course in Geology.....	6
(to be taken in 1 of the last 2 summers on campus)	
GEOL 4820 Capstone.....	3

II. Additional 18 credit hours in Geology courses at 2000-level and above:

III. Allied Math and Sciences (20 credits) Hrs.

CHEM 1020 or 1050 General Chem I.....	4
CHEM 1030 or 1060 General Chem II.....	4
MATH 2200 Calculus I.....	4
MATH 2205 Calculus II or MATH 2250 Elem Lin Algebra or GEOL 4525 Environmental Data Analysis.....	3-4
PHYS 1110 or 1210 Gen or Eng Physics.....	4

Note: This program represents a minimum proficiency. Students are strongly advised to elect additional courses in geology.

Bachelor of Science Curriculum Environmental Geology and Geohydrology (EGGH) Program

The Environmental Geology and Geohydrology degree is designed for those students who intend to become professionals in environmental fields such as consulting, site assessment, hazard assessment, and remediation.

The degree will prepare students for graduate school in environmental disciplines and for entry-level jobs.

I. Required Courses Hrs.

One of the following:

GEOL 1005 Earth History or.....	4
GEOL 1100 Physical Geology or.....	4
GEOL 1200 Historical Geology or.....	4
GEOL 1500 Water, Dirt, Climate or.....	4
GEOL 1600 Global Sustainability.....	4

And each of the following:

GEOL 2000 Geochemical Cycles, Earth System.....	4
GEOL 2010 Mineralogy.....	3
GEOL 2080 General Field Geology.....	3
GEOL 2100 Strat and Sediment.....	4
GEOL 4444 Geohydrology.....	4
GEOL 4490 Geochemistry.....	4
GEOL 4777 Geochem of Natural Waters....	3
GEOL 4880 Earth Surface Processes.....	3
GEOL 4820 Capstone.....	3

II. Required Allied Math and Science Courses

CHEM 1020 General Chem I.....	4
CHEM 1030 General Chem II.....	4
PHYS 1110 or 1210 Gen or Eng Physics.....	4
MATH 2200 Calculus I.....	4
MATH 2205 Calculus II.....	4

One of the following:

LIFE 1010 General Biology or.....	4
STAT 2050 Fund of Statistics or.....	4
MATH 2210 Calculus III or.....	4
PHYS 1120 General Physics II or.....	4
PHYS 1220 Eng Physics II.....	4

III. Additional 18 credit hours of Electives, in consultation with advisor

GEOL 2005 Intro to Geophysics or GEOL 3005 Principles of Geophysics.....	4
GEOL 2020 Intro to Petrology.....	2
GEOL 2070 Intro to Oceanography.....	4
GEOL 4610 Structure & Tectonics.....	4
GEOL 3400 Geologic Hazards.....	4
GEOL 3500 Global Change.....	4
GEOL 3600 Earth & Mineral Res.....	4
GEOL 3650 Energy, Geological Persp.....	4
GEOL 4001 Modeling in Earth System.....	4
GEOL 4113 Geological Remote Sensing.....	4
GEOL 4525 Environmental Data Analysis.....	4
GEOL 4888 Glaciology.....	3

NOTE: Students are encouraged, in consultation with their adviser, to design a major that best fits their interests and goals. With this in mind, there are many courses outside the Department of Geology and Geophysics that may be substituted for courses in the Electives (B) list above provided that such substitutions are made with the consent of an adviser. A

list of such courses may be obtained from the Department. Students who seek the Geology BS may not also seek EGGH as a double major, and vice versa.

Bachelor of Arts in Geology and Earth Science Curriculum

I. Required Courses Hrs. *Each of the following:*

GEOL 1000-level intro lab course(s).....	4-8
GEOL 2000 Geochemical Cycles & Earth System	4
GEOL 2010 Mineralogy.....	3
GEOL 2020 Intro to Petrology	2
GEOL 2100 Stratig/Sedimentation	4
GEOL 2080 General Field Geology.....	3
GEOL 4820 Capstone	3
LIFE 1010 General Biology.....	4
CHEM 1020 General Chemistry I.....	4
PHYS 1110 General Physics I.....	4
MATH 1405 Trigonometry	3
or	
MATH 1450 Algebra/Trig.....	5

II. Six courses from the following:

ATSC 2000 Meteorology.....	4
or	
GEOG 3450 Weather and Climate	3
ECON 2400 Economics of the Environment	3
GEOG 3010 Landforms and Soils.....	3
GEOL 2005 Intro to Geophysics or GEOL 3005 Principles of Geophysics	4
GEOL 2050 Principles of Paleontology	3
GEOL 2070 Intro to Oceanography	4
GEOL 3600 Earth & Mineral Resources	4
GEOL 3650 Energy: Geological Persp.....	4
GEOL 3400 Geologic Hazards	4
GEOL 3500 Global Change.....	4
GEOL 4444 Geohydrology.....	4
GEOL 4490 Geochemistry	3
GEOL 4610 Structural Geol/Tectonics.....	4
GEOL 4835 Applied/Exploration Geophysics.....	3
POLS 4051 Environmental Politics and Admin.....	3
SOIL 4120 Genesis, Morphology, Classification of Soils.....	4
ECON 4400 Environmental Economics	3
or	
ECON 4410 Natural Resource Economics	3

III. Additional 12 hours of electives with adviser consultation, at least 6 hours of which must be taken outside of the Department of Geology and Geophysics.

Undergraduate Minor

A minor in geology requires 20 hours of coursework in the Department of Geology and Geophysics. Students are required to take GEOL 1100, 1200, or 1500; GEOL 2000; GEOL 3400, 3500, or 3600; and 8 additional credits in consultation with their adviser. A grade of C or better is required in each of these courses.

Graduate Study

The department offers instruction and research programs leading to master of science and doctor of philosophy degrees in both geology and geophysics and to the master of science in geology/water resources.

Program Specific Admission Requirements

All applicants must complete an online departmental application form with statement of intent. Forms are available from the Department of Geology and Geophysics Web site at www.uwyo.edu/geolgeophys.

Application deadline is January 15 of each year.

All applicants should have completed undergraduate coursework including mathematics through calculus, one year of chemistry, basic training in geology, and for most areas, one year of calculus-based physics.

Applicants to the geophysics graduate program should have an undergraduate degree in geophysics, geology, mathematics, physics, or engineering.

Applicants to the Ph.D. program, without a M.S. degree, must have attained an exceptional undergraduate record.

Formal approval of application by the departmental admissions committee.

Formal acceptance by an adviser.

Formal notice of admission by the university.

Program Specific Graduate Assistantships

All applicants to the geology and geophysics graduate program are considered for assistantships. Applicants are NOT required to complete the graduate assistant application form.

Program Specific Degree Requirements

Master of Science in Geology

Plan A (thesis) (26 hours of coursework and 4 hours of thesis)

Preliminary and initial advising shall take place upon acceptance to the graduate program to identify background deficiencies and develop a list of required deficiency coursework to be taken. Deficiency coursework must be completed with a grade of B or better early in the student's graduate residence.

GEOL 5020 Fundamentals of Research is required of ALL graduate students during the first semester of residence.

All graduate students in geology must complete two semesters of GEOL 5200. Distinguished Lecture Series in the first two semesters of residence plus Rocky Mountain Field Trip.

All M.S. students in the Department of Geology and Geophysics will be required to complete a qualifying exam by the end of the second term in residence. Specific department examination requirements are available from the department office. Failure of this exam may result in dismissal from the graduate program.

The candidate's committee shall evaluate the thesis and conduct the final examination. The final exam is an oral presentation of the thesis, oral defense of thesis, and oral responses to questions relating to ancillary topics. Failure of this exam can result in dismissal. Retaking of the exam is subject to the discretion of the candidate's graduate committee.

Master of Science in Geophysics

Plan A (thesis) (26 hours of coursework and 4 hours of thesis)

Preliminary and initial advising shall take place upon acceptance to the graduate program to identify background deficiencies and develop a list of required deficiency coursework to be taken. Deficiency coursework must be completed with a grade of B or better early in the student's graduate residence.

GEOL 5020 Fundamentals of Research is required of ALL graduate students during the first semester of residence.

All graduate students in geophysics must complete two semesters of GEOL 5210. Distinguished Lecture Series in the first two semesters of residence plus Rocky Mountain Field Trip.

All M.S. students in the Department of Geology and Geophysics will be required to complete a qualifying exam by the end of the second term in residence. Specific department examination requirements are available from the department office. Failure of this exam may result in dismissal from the graduate program.

The candidate's committee shall evaluate the thesis and conduct the final examination. The final exam is an oral presentation of the thesis, oral defense of thesis, and oral responses to questions relating to ancillary topics. Failure of this exam can result in dismissal. Retaking of the exam is subject to the discretion of the candidate's graduate committee.

M.S. candidates in geophysics must complete 6 hours of mathematics and three hours of physics or engineering courses at the graduate level.

M.S. candidates must take at least 12 hours of 4000- and 5000-level courses in geophysics. Recommended graduate level mathematics courses include differential equations, numerical analysis, and real and complex variables; in physics and engineering they include classical mechanics, continuum mechanics, elasticity, electricity and magnetism. Substitutions for graduate-level geophysics courses may be made with the permission of the candidate's adviser. Remaining graduate-level course requirements may be made up from courses in physics, engineering, mathematics, and geology.

Doctor of Philosophy in Geology (42 hours of coursework and 30 hours of dissertation research)

Preliminary and initial advising will identify background deficiencies and develop a list of required deficiency coursework. Deficiency coursework must be completed with a grade of B or better early in the student's graduate residence.

Completion of GEOL 5020 Fundamentals of Research is required during the first semester of residence.

All graduate students in Geology must complete two semesters of GEOL 5200. Distinguished Lecture Series in the first two semesters of residence plus Rocky Mountain Field Trip.

All Ph.D. students in the Department of Geology and Geophysics will be required to complete a qualifying exam by the end of the second term in residence. Specific department examination requirements are available from the department office. Failure to complete the exam by the end of the second semester in residence without an approved extension will

result in suspension of the student's financial support, irrespective of the source of funding. Ph.D. students who fail the exam will be asked to withdraw from the graduate program or to enroll in the M.S. program.

The preliminary examination is administered following completion of 30 hours of 4000-level or higher coursework, not including independent study or research credits. Failure of this exam may, at the discretion of the thesis committee, lead to a re-examination during the following semester in residence, remedial work, or expulsion from the program.

The Ph.D. dissertation and its defense are described in the regulations section of this *Catalog*. Specific department examination requirements are available from the department office. The candidate's committee is responsible for monitoring progress of the research, refereeing the written work, and administering the final examination.

Doctor of Philosophy in Geophysics (42 hours of coursework and 30 hours of dissertation research)

Preliminary and initial advising will identify background deficiencies and develop a list of required deficiency coursework. Deficiency coursework must be completed with a grade of B or better early in the student's graduate residence.

All graduate students in geophysics must complete two semesters of GEOL 5210. Distinguished Lecture Series in the first two semesters of residence plus Rocky Mountain Field Trip.

Completion of GEOL 5020 Fundamentals of Research is required during the first semester of residence.

Ph.D. candidates in geophysics must complete at least 6 additional hours of graduate level coursework: 3 in mathematics and 3 in physics or engineering. Recommended graduate-level mathematics courses include differential equations, numerical analysis, and real and complex variables; in physics and engineering, they include classical mechanics, continuum mechanics, elasticity, electricity and magnetism. Ph.D. candidates are required to take at least 12 hours of 5000-level geophysics courses exclusive of GEOL 5854. Substitutions for graduate-level geophysics courses may be made with the permission of the candidate's adviser. Remaining graduate-level course requirements may be made up from courses in physics, engineering, mathematics, and geology.

All Ph.D. students in the Department of Geology and Geophysics will be required to complete a qualifying exam by the end of the second term in residence. Specific department examination requirements are available from the department office. Failure to complete the exam by the end of the second semester in residence without an approved extension will result in suspension of the student's financial support, irrespective of the source of funding. Ph.D. students who fail the exam will be asked to withdraw from the graduate program or to enroll in the M.S. program.

The preliminary examination is administered following completion of 30 hours of 4000-level or higher coursework, not including independent study or research credits. Failure of this exam may, at the discretion of the thesis committee, lead to a re-examination during the following semester in residence, remedial work, or expulsion from the program.

The Ph.D. dissertation and its defense are described in the regulations section of this *Catalog*. Specific department examination requirements are available from the department office. The candidate's committee is responsible for monitoring progress of the research, refereeing the written work, and administering the final examination.

Master of Science in Geology/Water Resources and Master of Science in Geophysics/Water Resources

Please refer to the Water Resources section of the *Catalog* for degree requirements.

Geology and Geophysics (GEOL)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB↔Q]).

1001. Earth Science and Society. 1. [I,L↔(none)] Introduces students to the study of Earth Science and its role in society through examination and discussion of current events, and through projects researching geologic topics of societal interest. *Prerequisite:* GEOL 1100 or concurrent enrollment.

1005. Earth History. 4. [S↔(none)] Reviews the evolution of the Earth including: the creation of the Universe, formation of a layered earth, development and history of continents, controls on climate change, and the origin and evolution of life. Class introduces basic geologic, chemical, physical and biologic concepts used to decipher Earth history.

1050. Gold and the American West. 3. [(none)◀▶PN] The gold rushes in the western United States offer a window into geologic principles and processes resulting to the accumulation of gold, and the consequences of resource extraction on the prospective geologic record of the Anthropocene. This course provides an interdisciplinary approach to natural resources.

1060. Geology of the National Parks. 3. [(none)◀▶PN] This course provides an overview of the geologic settings and processes that form the landscapes and features in the US National Parks and Monuments. We will use the National Parks to explore fundamental geologic concepts, Earth materials, natural hazards, and the dynamic tectonic forces that have affected the planet throughout geologic history.

1070. The Earth: Its Physical Environment. 4. [SE◀▶(none)] Discusses selected topics from geology, astronomy and meteorology illustrating fundamental concepts, processes, products and the interrelationships among them. Emphasizes nature of science and relationship between selected topics and society. Cross listed with ASTR 1070. *Prerequisites:* Math level 3 or equivalent courses, consent of instructor, elementary education major and EDCI 1450 must be taken concurrently.

1100. Physical Geology. 4. [SE◀▶PN] Studies modern concepts of the Earth's physical makeup including minerals and rocks, topography, crustal structure, plate tectonics and processes and forces acting on and within the earth.

1101. First-Year Seminar. 3. [(none)◀▶FYS]

1110. Physical Geology for Engineers. 4. [(none)◀▶PN] Introduction to geologic principles for engineers with emphasis on near surface processes and material properties. The first half will teach planetary basics, mineral/rock and geologic structure, surface processes, geologic material strength and deformation, and geohazards. The final half covers methods and analysis with the collection of geophysical data on-campus to assess near-surface properties with a full lab report. *Prerequisites:* MATH 1400 and MATH 1405 or MPE score of 5 or higher or SAT Math score of 600 or higher or ACT Math score of 27 or higher.

1450. Solving Problems for a Sustainable Future. 3. [(none)◀▶PN] The purpose of this course is to introduce students to problem solving and basic analysis in the context of Earth's environment. Content includes large scale environmental feedbacks, cycles, and processes. The primary goals of the course

are to gain an understanding of human/environment interactions and develop problem solving strategies.

1500. Water, Dirt, and Earth's Environment. 4. [SE◀▶PN]. Introductory environmental geology course focusing on water and soil both as hazards and as life-sustaining resources. Explores surface processes and climate change over geological and human timescales. Case studies illustrate the environmental tradeoffs of resource use. Cross listed with ENR 1500.

1600. Global Sustainability: Managing Earth's Resources. 4. [G,S◀▶(none)]. Uses biology, chemistry, physics and Earth science to examine Global Sustainability and how this worldview might guide our future management of Earth resources. Case studies in different international settings place questions of resource exploitation (discovery, extraction, processing, use and disposal) and sustainability in a larger global context.

1650. The Water-Energy-Climate Nexus. 3. [(none)◀▶PN] Among the grand challenges facing humanity, arguably the most significant are water, energy, and climate. These issues are, however not isolated but intimately connected, i.e. water-energy-climate (WEC) nexus. Using critical thinking and problem-solving skills, the significance of the WEC nexus to humanity will be explored from STEM and non-STEM perspectives. Cross listed with ERS 1650.

2000. Geochemical Cycles and the Earth System. 4. [SE◀▶(none)]. Introduces the Earth system, including the solid Earth, hydrosphere, biosphere and atmosphere. Emphasizes the evolution of the Earth, rock associations and geochemical cycles. Cross listed with ESS 2000. *Prerequisites:* a 1000-level GEOL course with a lab and concurrent enrollment in CHEM 1020. (Normally offered fall semester)

2010. Mineralogy. 3. Introduction to rock forming minerals. Includes introduction to crystallography, crystal chemistry, and the occurrence and identification of the common minerals, with emphasis on silicates. Field trip required. *Prerequisites:* GEOL 1005, 1100, or 1500; CHEM 1020 or concurrent enrollment.

2020. Introduction to Petrology. 2. Introduces the study of igneous, sedimentary, and metamorphic rocks in hand specimen. Covers textural and mineralogic classification of rocks and the tectonic environments in which they occur. Field trip required. *Prerequisite:* a grade of C or better in GEOL 2010.

2050. Principles of Paleontology. 3. Examines scientific principles, biological and geological, that underlie general study of

ancient life on Earth. Includes interactions of evolutionary, stratigraphic, taphonomic and paleogeographic concepts within various approaches to paleobiology and systematic paleontology. Optional field trip. *Prerequisite:* GEOL 1100 or LIFE 1000 or 1010. (Normally offered spring semester)

2070. Introduction to Oceanography. 4. Survey of ocean processes, including the major subdisciplines of physical, geological, chemical, and biological oceanography. Studies the form of the world ocean; composition and chemistry of seawater; circulation, currents, waves and tides; nutrients and organisms; estuaries and coastal processes; origin and distribution of deep-sea sediments; and impacts of human activities. *Prerequisites:* GEOL 1005, 1100, 1200, 1500 or ENR 1500; MATH 1405 or 1450.

2080. General Field Geology. 3. [SE◀▶(none)] Covers basic concepts of geology and field techniques emphasizing interpretation of geologic features in the field and constructing geologic products (e.g. measured sections and geologic maps). Students are expected to be able to identify the common rock forming minerals and common rocks in hand-sample. Weekly field trip required. *Prerequisites:* GEOL 1100 and at least one other GEOL course. (Normally offered the first half of the fall semester)

2100. Stratigraphy and Sedimentation. 4. Introduces principles of stratigraphy, materials and processes of sedimentation. Laboratory includes study and interpretation of sedimentary rocks, sedimentary structures and stratigraphic techniques. Field trip required. *Prerequisite:* GEOL 2010. (Normally offered spring semester)

2150. Geomorphology. 4. Discusses general principles of landform description and analysis. *Prerequisite:* GEOL 1100 or equivalent.

2220. Communicating Earth Science. 3. [(none)◀▶COM2] This course will focus on communicating science to non-scientists. Students will deliver earth science information through written, digital and oral presentations to be informative and interesting to the public. *Prerequisites:* grade of C or higher in GEOL 2010, COM1.

3005 [2005]. Principles of Geophysics. 4. Mechanisms and driving forces of Earth deformation, at length-scales from the tectonic to the microstructural. Introduces solid bodies, including stress and strain, with applications to plate tectonics, and surficial processes. Heat flow, electrical and electromagnetic fields are introduced, with applications to tectonic and

hydrologic problems. *Prerequisites:* 1000-level GEOL course with lab, PHYS 1110 or 1210. (Normally offered fall semester)

3040. Introduction to Groundwater. 3. This class will introduce the basic principles of Groundwater Hydrology such as hydrological cycle, mass balance, fluid properties, mechanics of flow through porous media, Darcy's law, aquifer and aquitards, groundwater wells, groundwater geology, and surface water/groundwater interaction. *Prerequisites:* A grade of B or higher in MATH 1405 or MATH 1450.

3110. Invertebrate Paleontology. 4. Encompasses taxonomy and morphology of major groups of invertebrate fossils. Includes examples of their use in correlation, environmental reconstruction and interpretation of evolution. *Prerequisite:* GEOL 1200. (Normally offered spring semester)

3250. Geosciences and Computers. 4. [I♦(none)] An integrated introduction to the basic components of modern scientific computing and to illustrate basic computing concepts through geoscience applications. *Prerequisite:* One USP designated science course with lab.

3400. Geologic Hazards: A Historical and Scientific Review. 4. [SE♦(none)] Geologic hazards include well-known catastrophic events such as earthquakes, volcanic eruptions and landslides, as well as lesser known processes such as soil expansion, land subsidence and ground failure. Economically, the latter processes have a much greater impact each year than the more notorious geologic events. Reviews geologic hazards from a historical and scientific perspective. Describes relevant geologic processes, how geologic evidence is used to identify regions at risk, monitoring procedures and the role of the scientist in predicting catastrophic geologic events. Prehistoric and historic events are used to illustrate temporal and spatial scales of geologic hazards. *Prerequisite:* junior standing.

3500. Global Change: A Geological Perspective. 4. Considers the geochemical and geophysical systems that control the Earth's climate, the geological and historical record of climate change, and then discusses the possible effect that human activities will have upon these chemical and geophysical systems. *Prerequisites:* junior standing and an introductory class in the physical sciences.

3600. Earth and Mineral Resources. 4. [Explores the geologic formation, production, and use of Earth and mineral resources, including building materials, chemical minerals, industrial minerals and metals. For each resource, the geologic environment and processes of formation are discussed. Exploration and

mining techniques for each resources are also reviewed and associated environmental problems and regulations examined. Beneficial and detrimental aspects of the use of each resource are also discussed. *Prerequisite:* completion of USP QA and L.

3650. Energy for Society: Addressing the Energy Grand Challenge. 4. [SE,G♦PN] Examines the energy needs of a modern industrialized society. Looks at the types of energy, the natural laws that govern its use, transformation, and conservation. The different sources of energy available to modern societies are examined. Examination includes fossil fuels, nuclear power as well as alternative energy sources. The formation of the resource is discussed, how it is extracted, and any environmental consequences associated with its extraction and use. *Prerequisite:* completion of USP QA and L.

4000. Paleomagnetism in Geology/Geophysics. 3. Studies paleomagnetic solutions in geoscience topics. Includes plate reconstructions; sea-floor formation; structural geology; dating of structural/tectonic events; western North American tectonics; global geomagnetic polarity reversals and time scale; magnetostratigraphic correlation; stratigraphic dating; dating diagenetic events; characteristics of core and mantle; extraterrestrial impacts and geologic phenomena; environmental and climate change applications. Field trip and laboratory project required. Dual listed with GEOL 5000. *Prerequisite:* GEOL 1000 or 1100; GEOL 1200 desirable.

4001. Modeling the Earth System. 4. Takes a modeling approach to demonstrate how the Earth is integrated into an interconnected system through exchanges of energy and matter, and how Earth system functioning is susceptible to human alteration. Unifying concepts focus on quantitative interactions between the Earth and the Sun, and between the Earth's lithosphere, hydrosphere, biosphere and atmosphere. Cross listed with BOT/ATSC/ESS 4001. *Prerequisites:* MATH 2205 or equivalent and [ESS 2000 or GEOL 2000].

4010. Petroleum Exploration and Production. 3. The purpose of this course is to provide students with information and skills necessary to understand the oil and gas modeling process from exploration to production. Topics will include geophysical exploration, seismic acquisition, geophysical modeling, reservoir characterization, reservoir production, well planning and decision making. Cross listed with ERS 4010. *Prerequisites:* GEOL 1100; MATH 2200 or MATH 2350.

4025. Igneous and Metamorphic Petrology. 4. An advanced study of igneous and metamorphic rocks in hand sample and thin section. Covers optical techniques for identifying minerals, the use of phase diagrams and geochemistry to understand the evolution of igneous rocks and the formation conditions of metamorphic rocks. A field trip is required. *Prerequisite:* GEOL 2020.

4030. Groundwater Flow and Solute Transport Modeling. 3. Movement of groundwater and the dissolved solute is responsible for a variety of environmental, engineering, and geological processes of interest. Presents an overview of the analyses of groundwater flow and solute transport using numerical modeling. The principles of the Finite Difference Method are introduced. Dual listed with GEOL 5030. *Prerequisites:* MATH 2205 and GEOL 4444/5444.

4050. Geology of Wyoming. 3. Survey of the geologic history of Wyoming beginning in the Precambrian and extending to the present. Stratigraphic and sedimentation history, igneous activity, metamorphism, and orogenic activity are emphasized in the lectures. Occasional field trips are required. *Prerequisite:* GEOL 1100 or an equivalent course. (Normally offered fall semester)

4060. Rocky Mountain Field Trip. 1 (Max. 3). A six-day geological field trip to various classic localities in the Rocky Mountains. *Prerequisites:* senior standing and GEOL 2010 and GEOL 4610 or 4050.

4113. Geological Remote Sensing. 4. Acquaints students with aircraft and spacecraft remote sensing of the environment, emphasizing geologic application to earth and other planetary bodies. Includes visible, infrared, ultraviolet, radio and radar sensing. Laboratory exercises are applications related to tectonics, geomorphology, paleoclimate, structure, stratigraphy, environmental geology and geologic hazards. Dual listed with GEOL 5113; cross listed with GEOG 4113. *Prerequisites:* GEOL 1005 or 1100 or 1200 or GEOG 1010 and MATH 1400/1405 or MATH 1450.

4125. Igneous Petrology. 2. Studies igneous rocks in thin section. Lectures cover mineralogy, geochemistry, phase equilibria and occurrence of igneous rocks. Labs study suites of igneous rocks in thin section. *Prerequisite:* GEOL 2010. (Offered fall semester of odd numbered years)

4130. Metamorphic Petrology. 2. Studies metamorphic rocks in thin section. Lectures cover mineralogy, phase equilibria and occurrence of metamorphic rocks. Labs study suites

of metamorphic rocks in thin section. *Prerequisite:* GEOL 2010. (Offered spring semester of odd-numbered years)

4150. Paleontology of Lower Vertebrates.

4. Explores evolutionary histories of lower vertebrates including fishes, amphibians, reptiles and birds. Optional field trip. *Prerequisites:* acceptable previous training in geology or zoology, 12 hours of biology and/or geology or ZOO 4000. (Normally offered every third year)

4160. Regional Tectonics. 2. A field-based introduction to the Mesozoic to early Cenozoic tectonic evolution of the U.S. Cordillera. Dual listed with GEOL 5160. *Prerequisite:* GEOL majors and junior or senior level standing.

4170. Paleontology of Cenozoic Placental Mammals. 4. Explores evolutionary histories of placental mammals' characteristic of Cenozoic era as documented through fossil record study. Optional field trip. *Prerequisite:* 12 hours of biology and/or geology or ZOO 4000. (Normally offered every third year)

4190. Petroleum Geology. 3. Principles governing the exploration for hydrocarbons; characteristics of reservoirs and traps; origin, migration and accumulation of hydrocarbons; subsurface evaluation techniques. Dual listed with GEOL 5190. *Prerequisite:* GEOL 2005 or PETE 2050.

4191. Methods in Petroleum Geology. 3. Lectures and laboratory exercises are designed to give the student experience in working with various kinds of geoscientific data in relation to the exploration for and production of hydrocarbons. Most exercises utilize real data and real situations. Topics include recognition of hydrocarbons, interpretation of sample, mud and geophysical logs, geologic utilization of drill stem tests; subsurface correlation and mapping techniques; prospect generation. Dual listed with GEOL 5191. *Prerequisite:* GEOL 4190.

4200 [4010]. Topics in Geology. 1-3 (Max. 9). Studies particular geology topics in-depth at undergraduate level. *Prerequisites:* senior standing and 20 hours in geology.

4210 [4020]. Topics in Geophysics. 1-3 (Max. 9). Studies particular geophysics topics in-depth at undergraduate level. *Prerequisites:* senior standing and 20 hours in geology.

4214. Topics in Economic Geology. 1-2 (Max. 2). Seminar in economic geology: topics will be influenced by the interest of students who register. For undergraduates looking to enroll in GEOL 4214, it is highly suggested that you have taken GEOL 4270 Ore Deposits before taking this class. Dual listed with GEOL 5214. *Prerequisite:* C or better in GEOL 2020.

4270. Hydrogeophysics. 3. Estimating groundwater parameters, contaminant transport, porosity and other hydrologic properties using geophysics. Integrates literature review, discussion, exercises and writing to introduce students to hydrogeophysics research. Students will acquire skills at reading technical publications, writing, and gain knowledge about current trends in the field. Emphasis on critical thinking and analysis of writing. *Prerequisites:* 20 hours of geology or engineering courses.

4280. Paleobotany. 4. An examination of the ecology and evolution of land plants throughout Earth history that emphasizes the profound impact plants have had on Earth's surface and atmosphere. Through a combination of lecture, discussion, and laboratory, the course will explore fossilized plant communities, their ecological properties, and effects of major environmental upheavals. Dual listed with GEOL 5280. Cross listed with BOT 4280. *Prerequisite:* a grade of C or better in LIFE 1010 or GEOL 1100.

4310. Advanced Stratigraphy. 3. Deals with characterizing and predicting the vertical and lateral distribution of sedimentary rocks. Includes correlation methods; use of facies models; facies delineation; impact of tectonics and changes in relative sea level on sedimentary record; transgressions and regressions; concept and construction of stratigraphic framework; and sequence stratigraphy. *Prerequisite:* GEOL 2100. (Normally offered spring semester)

4320. Cenozoic Stratigraphy. 4. Studies areal distribution, depositional environment, paleohydraulics, provenance, and correlation of global Cenozoic deposits. Required field trip. *Prerequisite:* GEOL 2100. (Offered based on sufficient demand and resources)

4420. Sedimentary Rocks. 4. Encompasses origin, classification and interpretation of sedimentary rocks including sandstones, mudrocks and carbonates. Topics also include depositional environments and basin analysis. Field trip required. *Prerequisites:* GEOL 2010 and GEOL 2100. (Offered based on sufficient demand and resources)

4440. High-Performance Computing for Scientists and Engineers. 3. Gives students an integrated introduction to the design, analysis and implementation of parallel codes on modern HPC systems. This course is interdisciplinary in nature, involving case studies in biology, physics, mathematics and geosciences. HPC systems at ARCC will be used for hands-on exercises. Offered satisfactory/unsatisfactory only.

4444. Geohydrology. 4. Examines the physical principles governing the occurrence, movement, and extraction of water in aquifers. Dual listed with GEOL 5444. *Prerequisite:* MATH 2205. (Normally offered fall semester)

4460. Planetary Geology. 3. Examines basic principles of planetary geology and their application to specific planetary examples. Core topics include solar system formation, impact cratering, and comparative planetology. Provides an opportunity to test terrestrial theories under extreme conditions, and provides insight into both early earth history and ongoing geological processes. *Prerequisites:* GEOL 2010 and GEOL 2100 and (Math 1400/1405 or 1450).

4470. Introduction to Geomodeling. 3. Introductory course in numerical modeling in the geosciences, offering coding experience as well as insight into the generalities of modeling. We develop, in class, simple geo-models, which allow experience constructing and testing computer models. As a minimum we will develop one extensive Finite Difference model and one minimalistic Finite Element model; other techniques will depend on student interests. *Prerequisites:* at least one semester of college level calculus and one semester of college level physics.

4490. Geochemistry. 4. Discusses chemical evolution of the Earth and details of chemical thermodynamics, phase rule chemistry, equilibrium reactions and reaction kinetics as applied to geology. *Prerequisites:* GEOL 2010, CHEM 1020, MATH 2200, 2205. (Normally offered spring semester)

4525. Environmental Data Analysis. 4. Explores fundamentals of environmental data analysis including the display and description of data, uncertainty propagation, statistical significance and power, t-tests, ANOVA, time series, serial correlation, multiple regression, and sample collection strategies. Students must enroll in a computer-based lab session and complete a term project involving real world problems in data analysis. Dual listed with GEOL 5525. Cross listed with ENR 4525/5525. *Prerequisites:* A grade of C or better in STAT 2050 or STAT 2070 or MATH 2200, junior standing or higher, and completion of at least one upper-division course in the natural sciences or a related field.

4610. Structural Geology and Tectonics. 4. Encompasses lectures, readings and problems dealing with character and causes of structures that deform Earth's crust. Field trips required. *Prerequisite:* GEOL 2010. (Normally offered fall semester)

4666. Plate Tectonics. 3. Studies theory of plate tectonics including quantitative assessment of observations which lead to its accep-

tance. Includes geometry of plate tectonics, plate boundaries and plate motions at present and in the past, evolution of plates including sea floor spreading and subduction processes, as well as driving mechanisms. Two lectures, one laboratory/discussion per week. Dual listed with GEOL 5666. *Prerequisites:* GEOL 4610, geology/geophysics math requirements. (Offered based on sufficient demand and resources)

4717 [5100]. Field Course in Geology. 1-8 (Max. 8). Reviews field observation of geologic phenomena, methods of geologic mapping and interpretation of data collected. Course includes a six-week field trip. *Prerequisites:* GEOL 2100, 4610. (Offered early summer)

4720 [4700]. Ore Deposits. 4. Teaches principles of economic geology of ore minerals. Lectures cover geochemistry of ore minerals and environments in which various ore minerals are found. Labs include identification of ore minerals in hand sample and under microscope and methodology of economic geology. Dual listed with 5720. *Prerequisite:* a grade of C or better in GEOL 2020. (Normally offered fall semester)

4760. Rates and Timescales of Surface Processes. 3. Explores methods for quantifying rates and timescales of weathering, erosion, soil formation, nutrient cycling and other surface processes. Focus includes cosmogenic nuclides, tracer thermochronometry, U-series disequilibrium, fallout radionuclides, and optically stimulated luminescence. Course features a mix of instructor-driven lectures on fundamentals and student-driven discussion of cutting-edge research from recent literature. Dual listed with GEOL 5760. *Prerequisites:* GEOL2150 or GEOG 3010 or GEOL 4880 and MATH 2205 and CHEM 1020 and PHYS 1100.

4777. Geochemistry of Natural Waters. 3. Studies physical chemistry applied to natural waters, and chemistry of rock weathering, sources and controls on major, minor and trace elements, plus problems related to introduced pollutants. Dual listed with GEOL 5777. *Prerequisites:* GEOL 2010, MATH 2205, and CHEM 1030.

4800. Independent Study. 1-3 (Max. 6). Encompasses field, laboratory or library research for senior students in department. *Prerequisites:* senior standing and not fewer than 20 hours in geology.

4820. Capstone. 3. [WC◀COM3] Critical examination of landmark papers and their influence on the Earth sciences. Through readings, lectures, discussions and in oral and written presentations, the student will gain a

broad perspective over the impact of key issues in the field. *Prerequisites:* junior standing and 26 hours in the department.

4835 [4970]. Applied/Exploration Geophysics. 3. Discusses the fundamentals of Applied or Exploration Geophysics, encompassing lecture, laboratory classes and discussion of case histories. It covers the Seismic Refraction, Seismic Reflection, Gravity, and Magnetics methods. Provides a solid grounding about the exploration of the Earth's subsurface for mineral and hydrocarbon resources, and environmental issues. Dual listed with GEOL 5835. *Prerequisites:* 1000-level GEOL course with lab, PHYS 1110 or 1210 and MATH 2200.

4850. Principles of Digital Filtering and Time Series Analysis. 3. Studies principles and applications of data processing techniques as used in seismic exploration, oceanography, gravity and magnetic prospecting, remote sensing and other areas of earth science. Includes discrete versus continuous time series; fourier and Z-transforms; layer matrix analysis; reflectivity function; deconvolution and predictive deconvolution; digital filter design; array analysis; velocity filters; and migration. *Prerequisite:* mathematics through calculus. (Normally offered fall semester)

4880. Earth Surface Processes. 3. Quantitative interpretation of Earth's surface processes. Uses a quantitative approach to demonstrate how the development of landforms can be modeled. *Prerequisites:* MATH 2205 (2210 preferred), PHYS 1210.

4888. Glaciology. 3. Dynamics of frozen water. Covers behavior of ice masses, in the form of glaciers or ice-sheets, and geomorphic aspects of glacial erosion and deposition. Includes forcing and feedbacks between cryosphere and global climate. *Prerequisite:* MATH 2205, PHYS 1210 (1310). (Offered every second year spring semester)

5020. Fundamentals of Research. 2. Lectures, discussion and projects centered on three fundamental aspects of research: development of research tools, understanding the scientific method, learning how to write a grant, read the literature and present a talk. Class is designed for all incoming graduate students in the department. *Prerequisite:* graduate standing.

5030. Groundwater Flow and Solute Transport Modeling. 3. Movement of groundwater and the dissolved solute is responsible for a variety of environmental, engineering, and geological processes of interest. Presents an overview of the analyses of groundwater flow and solute transport using numerical modeling.

The principles of the Finite Difference Method are introduced. Dual listed with GEOL 4030. *Prerequisites:* MATH 2205, GEOL 5444.

5050. Introduction to Isotope Geology. 3. Understanding of atomic structure, radioactive decay, mass spectrometry, dating techniques and petrologic uses of isotropic systems. Emphasis will be placed on evaluating dating methods in relation to particular geologic problems and possible sources of error. The use of isotopes in defining magmatic sources and crustal contamination are discussed. *Prerequisites:* CHEM 1020, CHEM 1110, MATH 2200, MATH 2205.

5113. Geological Remote Sensing. 4. Acquaint students with aircraft and spacecraft remote sensing of the environment, emphasizing geological application to earth and other planetary bodies. Includes visible, infrared, ultraviolet, radio and radar sensing. The laboratory exercises are applications related to tectonics, geomorphology, paleoclimate, structure, stratigraphy, environmental geology and geologic hazards. Dual listed with GEOL 4113. *Prerequisites:* GEOL 1005 or 1100 or 1200 or GEOG 1010 and MATH 1400/1405 OR MATH 1450.

5120. Tectonic Evolution of the North American Cordillera. 4. Phanerozoic tectonic evolution of western North America viewed through the paradigm of plate tectonics. Course involves intensive literature review, guest speakers, a possible field trip, and an in depth regional tectonic analysis to be done by each student. *Prerequisite:* GEOL 2020, GEOL 2100, and GEOL 4610.

5150. Metamorphic Petrology. 4. Lectures on field occurrence, macroscopic and microscopic characteristics of igneous rocks, followed by lectures on application of physical chemistry to genetic study of igneous rocks. Laboratory devoted to the study of suites of igneous rocks from classical areas. *Prerequisite:* GEOL 2020 and 4490; graduate standing.

5160. Regional Tectonics. 2. A field-based introduction to the Mesozoic to early Cenozoic tectonic evolution of the U.S. Cordillera. Dual listed with GEOL 4160. *Prerequisite:* graduate standing.

5180. Reflection Seismology. 3. Lectures treating seismic methods applied to the study of earth structures ranging from exploration to crustal structure. Topics covered include wave propagation recording techniques, processing, modeling, resolution and interpretation. Laboratory exercises give practical experience on lecture topics and emphasize use of instruments and data analysis. Computer processing introduced. *Prerequisite:* GEOL 1200, one year of calculus and one year of physics.

5190. Petroleum Geology. 3. Principles governing the exploration for hydrocarbons; characteristics of reservoirs and traps; origin, migration and accumulation of hydrocarbons; subsurface evaluation techniques. Dual listed with GEOL 4190. *Prerequisites:* GEOL 2100, 4610.

5191. Methods in Petroleum Geology. 3. Lectures and laboratory exercises are designed to give the student experience in working with various kinds of geoscientific data in relation to the exploration for and production of hydrocarbons. Most exercises utilize real data and real situations. Topics include recognition of hydrocarbons, interpretation of sample, mud and geophysical logs, geologic utilization of drill stem tests; subsurface correlation and mapping techniques; prospect generation. *Prerequisite:* GEOL 5190.

5200. Topics in Geology. 1-3 (Max. 9). Provides a detailed study at a graduate level of a particular topic in geology. *Prerequisite:* graduate standing in geology and geophysics and permission of the instructor.

5210. Topics in Geophysics. 1-3 (Max. 9). Provides a detailed study at a graduate level of a particular topic in geophysics. *Prerequisite:* graduate standing in geology and geophysics and permission of instructor.

5211. Seminar in Structural Geology and Tectonics. 1 (Max. 6). Selected topics in structural geology and tectonics. On-going research among undergraduate and graduate students is emphasized. *Prerequisite:* GEOL 4610 or equivalent course.

5212. Sedimentary Seminar. 1 (Max. 3). Seminar in selected topics in sedimentary geology. Designed to bring, and keep, graduate students up to date with the current literature and new, unpublished ideas. Visiting lecturers and presentations of student and faculty research. *Prerequisite:* graduate standing.

5213. Seminar in Tectonics. 2. Graduate topical seminar focused on tectonic. The class is a mixture of lectures, readings, and original research involving the compilation/generation, analysis, and interpretation of data to understand geodynamic processes and events. *Prerequisite:* graduate standing.

5214. Topics in Economic Geology. 1-2 (Max. 2). Seminar in economic geology: topics will be influenced by the interest of students who register. For undergraduates looking to enroll in GEOL 4214, it is highly suggested that you have taken GEOL 4270 Ore Deposits before taking this class. Dual listed with GEOL 4214.

5215. Inverse Theory. 3. Inverse theory is about learning the techniques to invert data for an acceptable model. The simplest example is

least-squares fitting of a line. Covers inversion of both over and under-determined inverse problems, regularization techniques, bayesian theory, along with probabilistic viewpoints. *Prerequisites:* graduate standing in geology and geophysics; linear algebra, MATLAB programming.

5216. Global Seismology. 3. Introductory class in theoretical seismology with emphasis on wave propagation. Topics include elastic wave theory for body and surface waves, normal modes, anisotropic wave propagation, source processes, and derivation of the wave equation, the ray theoretical approximation, representation theorems, stress/strain constitutive relations, normal modes, surface waves, and attenuation operators. *Prerequisites:* graduate standing in geology or geophysics and permission of the instructor.

5217. Geodynamics. 3. Examines the fundamental physical processes necessary for the understanding of plate tectonics and a variety of other geological phenomena. Provides a solid grounding for future study and research covering plate tectonics, stress & strain, elasticity, isostasy & the flexural strength of the lithosphere, gravity, and thermal processes. *Prerequisites:* GEOL 1100, one year of college level Physics and MATH 2210.

5220. Vertebrate Morphology and Evolution. 2. Course for paleontology majors and vertebrate anatomists involving advanced concepts, recent literature, and research training in the areas of morphology and evolution of fossil vertebrates. Cross listed with ZOO 5220. *Prerequisite:* GEOL/ZOO 4150 or GEOL/ZOO 4160, or GEOL/ZOO 4170 or ZOO 4000.

5230. Vertebrate Paleobiogeography. 2. Lectures and discussions devoted to use of data from the fossil record of vertebrates in interpreting ancient distributions of land-masses and seaways, recognizing paleoclimatic changes, and documenting the evolution of zoogeographic provinces. *Prerequisite:* GEOL/ZOO 4150, or GEOL/ZOO 4160 or GEOL/ZOO 4170.

5270. Hydrogeophysics. 3. Estimating groundwater parameters, contaminant transport, porosity and other hydrologic properties using geophysics. Integrates literature review, discussion, exercises and writing to introduce students to hydrogeophysics research. Students will acquire skills at reading technical publications, writing, and gain knowledge about current trends in the field. Emphasis on critical thinking and analysis of writing. *Prerequisites:* 20 hours of geology or engineering courses.

5280. Paleobotany. 4. An examination of the ecology and evolution of land plants throughout Earth history that emphasizes the

profound impact plants have had on Earth's surface and atmosphere. Through a combination of lecture, discussion, and laboratory, the course will explore fossilized plant communities, their ecological properties, and effects of major environmental upheavals. Dual listed with GEOL 4280. Cross listed with BOT 5280. *Prerequisite:* graduate standing.

5300. Sedimentary Basins. 4. Sedimentary basin evolution are examined from the view point of plate tectonics, thermal histories, and lithospheric processes. Quantitative basin modeling techniques are applied to understanding subsidence histories, sea level changes, and the primary controls on the formation of stratigraphic sequences. *Prerequisite:* 1 year of calculus.

5321. Engineering and Environment Geophysics. 3. Theoretical background for electrical, electromagnetic, georadar, and other near-surface geophysical measurements. Practical exercises focused on modeling, inversion, data analysis and experimental design. Discussion of applications to engineering and environmental problems. Basic knowledge of MATLAB programming language is helpful, but not required. Cross listed with CE 5321. *Prerequisite:* MATH 2250 or MATH 2200.

5330. Mechanics of Sediment Transport, Erosion and Deposition. 4. Erosion, transport, and deposition of sediments are examined from a first-principles basis. Physical processes are derived from fluid dynamics, statistical mechanics, and mass conservation. These topics are then used to explore landscape and seascape evolution, morphodynamics, and stratigraphic construction. *Prerequisites:* GEOL 2100 or equivalent.

5340. Advanced Tectonics and Sedimentation. 3. Lectures, seminars, and field observations on the relations between tectonism and the sedimentary record. Topics include a review of plate tectonic theory, characteristics of major types of sedimentary basins, techniques for evaluating tectonic activity from evidence in the sedimentary record and large-scale tectonosedimentary elements. *Prerequisites:* graduate standing, GEOL 2100, and GEOL 4610.

5410. Geochemical Analytical Methods. 3. Applied course in common geochemical analytical methods. Consists of lectures and laboratories with individual hands-on training. Includes sample handling, method development, and data interpretation for several analytical instruments including but not limited to inductively coupled argon plasma emission and ion chromatography. Other analytical methods are also treated. *Prerequisite:* GEOL 4490.

5420. Surfaces and Interfaces. 3. Examines the role of surfaces and solid-solution interfaces in regulating the chemistry of the Earth's surface. Subjects to be covered includes surface tension, capillarity, and the thermodynamics of surfaces; the equilibrium and kinetic chemistry of absorption-desorption; dissolution-precipitation kinetics and controlling factors; surface catalysis; and surface oxidation-reduction reactions. Presented in the context of geochemically and environmentally important processes such as chemical weathering, partitioning of solutes between water and surfaces, and the transport and degradation of pollutants. *Prerequisite:* One of the following: GEOL 4490, 4777, 5777, CHEM 3020, CHEM 4507.

5444. Geohydrology. 3. Examines the physical principles governing the occurrence, movement, and extraction of water in aquifers. Dual listed with GEOL 4444. *Prerequisite:* MATH 2205. (Normally offered fall semester)

5446. Introduction to Geostatistics. 3. The development of the basic principles of geostatistics and its practical applications in the geosciences will be presented. Main topics include: spatial analysis, kriging, cokriging, geostatistical simulations (unconditional, conditional). If time permits additional topics include: simple kriging, indicator kriging and block kriging. *Prerequisites:* MATH 2200, 2205, 2250 and STAT 2000.

5450. Geochemical Modeling. 3. Modeling of geochemical processes in fluid-rock systems of the Earth's crust. Emphasizes development and application of conceptual models as well as quantitative numerical models. Reinforces and expands fundamental skills in aqueous and fluid-rock geochemistry to better understand geochemical processes and solve problems in fluid-rock systems. *Prerequisite:* GEOL 4777/5777 or GEOL 5610 or GEOL 4490.

5470. [5460]. Introduction to Geomodeling. 3. Introductory course in numerical modeling in the geosciences, offering coding experience as well as insight into the generalities of modeling. We develop, in class, simple geo-models, which allow experience constructing and testing computer models. As a minimum we will develop one extensive Finite Difference model and one minimalistic Finite Element model; other techniques will depend on student interests. *Prerequisites:* at least one semester of college level calculus and one semester of college level physics.

5525. Environmental Data Analysis. 4. Explores fundamentals of environmental data analysis including the display and description of data, uncertainty propagation, statistical significance and power, t-tests, ANOVA, time series, serial correlation, multiple regression,

and sample collection strategies. Students must enroll in a computer-based lab session and complete a term project involving real world problems in data analysis. Dual listed with GEOL 4525. Cross listed with ENR 4525/5525.

5550. Numerical Methods in Ground Water Geology I. 3. Numerical solution of ground water flow equations with emphasis on steady state and elementary time dependent finite difference techniques. *Prerequisites:* GEOL 4444 or 5444, competence in FORTRAN programming.

5560. Numerical Methods in Ground Water Geology II. 3. Time dependent digital simulation models designed to forecast impacts of ground water developments. *Prerequisite:* GEOL 5550.

5570. Advanced Geohydrology. 3. Aquifer performance and testing, ground water basin development and management, conjunctive use of ground and surface water, and regional water resource investigations. *Prerequisite:* GEOL 4444 or 5444.

5600. Theoretical Petrology. 3. Graphic and analytical techniques used to evaluate the genesis of igneous and metamorphic rocks. Principles of thermodynamics, activity-composition relations, and G-X diagrams will be reviewed. Igneous topics include: use of phase diagrams, heat and mass transfer, magma generation. Fluid rock equilibria and Schreinemaker's analysis will be used to evaluate the origin of metamorphic rocks. *Prerequisites:* GEOL 4490.

5610. Geological Thermodynamics I. 4. Laws of thermodynamics, conditions which constitute chemical equilibrium, and multiple component systems as applied in geologic problems. *Prerequisites:* MATH 2200, MATH 2205, CHEM 1030, consent of instructor.

5630. Electronic Microprobe. 3. Lectures cover the theory of X-ray emission analysis, microprobe instrumentation, and data reduction procedures. Labs cover various uses of microprobe in solving geological problems. *Prerequisites:* consent of instructor.

5640. Advanced Igneous Petrology Seminar. 1-3 (Max. 9). Advanced training in igneous petrology emphasizing applications of chemical principles to the study of igneous rocks. Each year a different aspect of igneous petrology are covered in detail. *Prerequisites:* GEOL 4490, 5050.

5650. Advanced Metamorphic Petrology. 3. Review of the literature and study of the advanced concepts in metamorphic petrology. *Prerequisite:* GEOL 5150.

5660. Microstructural Analysis of Deformed Rocks. 4. The use of microscope in the interpretation of natural strain in rocks is

emphasized. Lectures and extensive laboratory exercises are the principle components of the course. Microfabric analysis using the universal stage is introduced. *Prerequisites:* GEOL 4610 required, GEOL 5150 recommended.

5666. Plate Tectonics. 3. The theory of plate tectonics including a quantitative assessment of the observations which lead to its acceptance and limitations. Topics include: geometry of plate tectonics, plate boundaries and plate motions at present and in the past, evolution of plates including sea floor spreading and subduction processes, and driving mechanisms. Two lectures, one laboratory/discussion per week. Dual listed with GEOL 4666. *Prerequisites:* GEOL 4610, geology/geophysics math requirements.

5700. Seminar in Structure and Development of the Earth's Crust. 3. Seminar in structure and development of the Earth's crust. Topics include structure and geochemistry of the Precambrian plate tectonics in the Precambrian early history of the Earth, seismic refraction crustal models, seismic reflection crustal models, and crustal genesis. *Prerequisites:* admission is by consent of instructor, GEOL 4610 and one semester of geophysics.

5720. Ore Deposits. 4. Teaches principles of economic geology of ore minerals. Lectures cover geochemistry of ore minerals and environments in which various ore minerals are found. Labs include identification of ore minerals in hand sample and under microscope and methodology of economic geology. Dual listed with GEOL 4720. *Prerequisite:* GEOL 2010.

5730. Seismic Data Processing. 3. Fundamentals of seismic reflection data processing: processing of field tapes, cross-correlation, velocity analysis, stacking, and deconvolution. Statistics correct, migration, coherency filtering. *Prerequisites:* GEOL 5180, MATH 4430, MATH 4440.

5760. Rates and Timescales of Surface Processes. 3. Explores methods for quantifying rates and timescales of weathering, erosion, soil formation, nutrient cycling and other surface processes. Focus includes cosmogenic nuclides, tracer thermochronometry, U-series disequilibrium, fallout radionuclides, and optically stimulated luminescence. Course features a mix of instructor-driven lectures on fundamentals and student-driven discussion of cutting-edge research from recent literature. Dual listed with GEOL 4760. *Prerequisites:* GEOL2150 or GEOG 3010 or GEOL 4880 and MATH 2205 and CHEM 1020 and PHYS 1100.

5777. Geochemistry of Natural Waters. 3. Physical chemistry of solutions applied to natural waters. Chemistry of rock weathering,

controls on major, minor, and trace element contents of natural waters. Problems of introduced pollutants. Dual listed with GEOL 4777. *Prerequisites:* GEOL 2010, MATH 2205, and CHEM 1030.

5820. Advanced Geomorphology. 1-3 (Max. 6). Graduate reading and discussion seminar on current topics in surficial processes. An in-depth analysis of the literature and work, with the subject matter determined by student interest. May include lectures. *Prerequisite:* senior or graduate standing in geology.

5835. Applied/Exploration Geophysics. 3. Discusses the fundamentals of Applied or Exploration Geophysics, encompassing lecture, laboratory classes and discussion of case histories. Covers the Seismic Refraction, Seismic Reflection, Gravity, and Magnetism methods. Provides a solid grounding about the exploration of the Earth's subsurface for mineral and hydrocarbon resources and environmental issues. Dual listed with GEOL 4835. *Prerequisite:* graduate standing in geology.

5850. Economic Geology. 1-6 (Max. 6). *Prerequisite:* graduate standing in geology.

5851. Environmental Geology. 1-6 (Max. 6). *Prerequisite:* graduate standing in geology.

5852. Geochemistry. 1-6 (Max. 6). *Prerequisite:* graduate standing in geology.

5853. Geomorphology. 1-6 (Max. 6). *Prerequisite:* graduate standing in geology.

5854. Geophysics. 1-6 (Max. 6). *Prerequisite:* graduate standing in geology.

5855. Ground Water Hydrology. 1-6 (Max. 7). *Prerequisite:* graduate standing in geology.

5856. Mathematical and Statistical Geology. 1-6 (Max. 6). *Prerequisite:* graduate standing in geology.

5857. Mineralogy and Crystallography. 1-6 (Max. 6). *Prerequisite:* graduate standing in geology.

5858. Paleontology. 1-6 (Max. 6). *Prerequisite:* graduate standing in geology.

5859. Petrology. 1-6 (Max. 6). *Prerequisite:* graduate standing in geology.

5860. Sedimentology. 1-6 (Max. 6). *Prerequisite:* graduate standing in geology.

5861. Stratigraphy. 1-6 (Max. 6). *Prerequisite:* graduate standing in geology.

5862. Structural Geology. 1-6 (Max. 6). *Prerequisite:* graduate standing in geology.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1 - 2. (Max 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5980. Dissertation Research. 1-12. (Max. 48). Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate level degree program.

5990. Internship. 1-12 (Max. 14). *Prerequisite:* graduate standing.

Department of History and American Studies

History

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Professor:

RENEE LAEGREID, B.A. Washington State University 1982; M.A.L.S. Wesleyan University 1994; Ph.D. University of Nebraska 2002; Professor of History 2015, 2012.

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ISADORA A. HELFGOTT, B.A. Swarthmore College 1994; A.M. Harvard University 1997; Ph.D. 2006; Associate Professor of History 2015, 2009.

JEFFREY D. MEANS, B.A. Grand Canyon University 1995; M.A. University of Montana 2001; Ph.D. University of Oklahoma 2007; Associate Professor of History 2013, 2007.

Assistant Professor:

ADAM BLACKLER, B.A. Carroll College 2006; M.A. University of Wyoming 2009; Ph.D. University of Minnesota – Twin Cities 2017; Assistant Professor of History 2018.

ALEXANDRA KELLY, B.A. University of Chicago 2004; M.A. 2005; Ph.D. Stanford University 2014; Assistant Professor of History and Anthropology 2014.

BARBARA E. LOGAN, B.A. Queens College, CUNY 1986; Ph.D. University of California-Santa Cruz 2002; Assistant Professor of History 2018, 2011.

MELISSA MORRIS, B.A. Miami University 2004; M.A. Miami University 2010; Ph.D. Columbia University 2017; Assistant Professor of History 2018.

PETER WALKER, B. A. University of Oxford 2008; M. Phil. University of Oxford 2010; Ph. D. Columbia University 2016; Visiting Assistant Professor of History 2019.

Adjunct Faculty:

MICHAEL J. DEVINE, B.A. Loras College 1967; M.A. Ohio State University 1968; Ph.D. 1974; Adjunct Professor of History, 2014, 1991.

Professors Emeriti:

Eric D. Kohler, William H. Moore, Phil Roberts

History is a foundational discipline that blends the methodologies and perspective of the humanities and social sciences in order to engage with the history of human culture on a global scale. UW's History degree program emphasizes interdisciplinary teaching and research and provides course work, research experiences, and internships on both American and international topics. The History program offers a Bachelor of Arts degree major and minor, and a Master of Arts degree.

The study of History at the University of Wyoming provides students with the tools to comprehend the present in order to prepare for the future. Challenging courses are designed to facilitate critical thinking and the development of analytical skills. Each of our courses features the discussion of complex issues, the development of writing and reading skills, and is generally oriented toward promoting individual enrichment. The professional skills that the History program instills transcend our field and allow students to work toward a variety of career choices such as business, law, government service, public history, archives and museum work, education, management, writing, and graduate studies. The ability to develop perspective, render informed judgments, and function as productive citizens of the global community stand as hallmarks of our program.

Learning Outcomes

It is the goal of the History department that our graduates have the following skills and knowledge:

- Students shall be able to demonstrate thinking skills by analyzing, synthesizing, and evaluating historical information from multiple sources.
- Students will develop the ability to distinguish between fact and fiction while understanding that there is no one historical truth.
- Students will produce well-researched written work that engages with both primary sources and the secondary literature.
- Students will develop an informed familiarity with multiple cultures.
- Students will employ a full range of techniques and methods used to gain historical knowledge.
- Students will develop an ability to convey verbally their historical knowledge.
- Students will demonstrate their understanding of cause and effect along with their knowledge of the general chronology of human experience.

Undergraduate Major

The History major requires a minimum of 36 credit hours in History courses or approved substitutions and an additional 12 hours of a single foreign language or equivalent credit by examination as determined by the Department of Modern and Classical Languages. All courses used to satisfy major requirements – including the language requirement – must be completed with a grade of C or better. To complete the Bachelor of Arts (B.A.) degree in History, all University Studies Program (USP) and college requirements must also be satisfied.

Specific requirements for the History major are as follows:

Lower-Division Electives (12 hours)

Upper-Division Electives (15 hours)

Elective: any level (3 hours):

One additional History course at any level

Two required courses (6 hours):

1. HIST 3020, Historical Methods
2. HIST 4030, Senior Capstone Seminar

Language

Students must complete three semesters of a single foreign language or the equivalent as determined by the Department of Modern and Classical Languages. This requirement may be satisfied by American Sign Language.

Undergraduate Minor

The history minor must take at least 18 semester hours of history courses, 9 hours of which must be at the 3000-4000 level. These courses must be taken for letter grades with a minimum earned grade of C. For assistance in tailoring the minor content, contact the department office.

History/Social Studies Education Majors

Through a cooperative agreement with the College of Education, students can now earn concurrent majors or dual degrees in history and secondary education in social studies. Interested students should inquire with the Office of Teacher Education, McWhinnie Hall, room 100.

Graduate Study

The History Department offers a Master of Arts (MA) degree.

Program Specific Admission Requirements

General Regulations

The M.A. in History requires 18 hours of undergraduate history courses as minimum preparation for admission. The rules under which the student enters remain those governing the program for the duration of the student's continued enrollment. In accordance with university graduate regulations, students are responsible for meeting all deadlines and for fulfilling all requirements for the degree.

Application and Admissions

To be eligible for financial support in the form of a Graduate Assistantship, the Department of History must receive all materials by March 1. All other application materials must be received by the Department of History no later than May 1. The application process is now completely online. In addition to the application, applicants must upload the following documents via the UW Admissions website (www.uwo.edu/admissions):

1. GRE EXAM with a score of at least 150 on the verbal reasoning section and a score of at least 141 on the quantitative reasoning section is required.
2. Three letters of recommendation that assess the student's academic and research abilities.

3. Transcripts from all undergraduate institutions and graduate programs.
4. A writing sample of 10-20 pages, typically either a portion of a senior thesis or an upper-level seminar paper.
5. A statement of purpose of 250-500 words, explaining the applicant's preparation, interests, and plans. Please indicate if you would like to be considered for a graduate assistantship.

Program Specific Graduate Assistantships

When applicants submit their materials to the program in History, they should indicate their wish to be considered for a Graduate Assistantship. Anyone receiving financial support must be registered as a full-time (9 hours per semester) student and must be making acceptable progress towards degree completion. Renewal of Graduate Assistantships is contingent on such progress. Support is not given for more than two academic years.

Program Specific Degree Requirements

Master's Program

Candidates for the MA in history are required to complete a minimum of 31 hours of graduate credit. Students must complete 27 hours of coursework, with at least 24 hours in history. This will include:

1. History 5880, History Theory.
2. 12 hours of history course work in 5000-level, non dual-listed courses (excluding HIST 5880).
3. 4 hours of thesis research (HIST 5960).
4. Students must demonstrate a reading knowledge of a foreign language appropriate to their research. Generally, the language requirement may be met by either of the following options:
 - a. Passing a language exam administered by the Department of History.
 - b. Completing the equivalent of the fourth semester of a language as offered at the University of Wyoming. All courses must be passed with a grade of C or better (may be taken pass/fail). In special cases other relevant historical tools may substitute for the language requirement upon approval of the thesis adviser and the Graduate Coordinator.

5. In the spring semester of the first year, typically in early February, as scheduled by the Department Chair, the student will publicly defend his/her thesis proposal, which must include a written research prospectus and bibliography.
6. The student will successfully defend the final thesis draft before the Graduate Committee.

History (HIST)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦♦Q]).

1110. Western Civilization I. 3. [CH♦♦H] Surveys basics of Western European civilization from decline of Roman Empire to 1700.

1120. Western Civilization II. 3. A broad survey of European history in the Western tradition from 1700 to present.

1210. United States History I. 3. Surveys U.S. history 1607-1865. Together with HIST 1220, it is the foundation on which all U.S. history courses offered by the department are based. Students cannot receive credit for both HIST 1210 and 1211.

1211. U.S. to 1865. 3. [V♦♦V] Surveys U.S. history through the Civil War which by itself meets the requirements of the Wyoming statutes providing for instruction in the provisions and principles of the constitutions of the United States and Wyoming. Students cannot receive credit for both HIST 1210 and 1211. (Normally offered fall semester)

1220. United States History II. 3. Surveys U.S. history from reconstruction to recent past. Together with HIST 1210, it is the foundation for all U.S. history courses offered by the department. Students cannot receive credit for both HIST 1220 and 1221.

1221. U.S. From 1865. 3. [V♦♦V] Surveys U.S. history from the Civil War to the present and meets the requirements of the Wyoming statutes providing for instruction in the provisions and principles of the constitutions of the U.S. and of Wyoming. Students cannot receive credit for both 1220 and 1221. (Normally offered spring semester)

1250. History of Wyoming. 3. A study of Wyoming from its beginning to the present. Students cannot receive credit for both HIST 1250 and 1251.

1251. Wyoming History. 3. [V♦♦V] A survey which encourages an understanding of Wyoming history, how it relates to the history of the West and the rest of America and how it has influenced the present. An important component is to learn about the U.S. and the Wyoming constitutions and how these two

documents have influenced Wyoming history. Students cannot receive credit for both HIST 1250 and 1251.

1290. History of the U.S. West. 3. An introductory survey of the American West, with consideration of developments in both the 19th and 20th centuries.

1320. World History to 1500. 3. [CS,G♦♦H] A history of the world's peoples and societies from human prehistory to 1500, with an emphasis on the diversity and interconnectedness of human life in the past.

1330. World History since 1500. 3. [CS,G♦♦(none)] A history of the world's peoples and societies from 1500 to the present, with an emphasis on the diversity and interconnectedness of human life in the past.

2020. American Military History. 3. Surveys military experiences of U.S. from colonial period to the present. In addition to specific wars, examines military doctrines and political, social and economic forces that shaped conduct of war in American history.

2030. History and Environmental Science. 3. [(none)♦♦H] This course is designed as an introduction to both the historical work of environmental historians and the scientific work of environmental scientists. No previous background in either history or science is required. Cross listed with ENR 2030.

2040. Imperial China. 3. [CS,G♦♦(none)] Surveys China's social, intellectual, political, cultural, technological and ethnohistory from earliest historical period through the last imperial dynasty, and China's role in greater E. Asian and world history. Provides background for other Asia-related courses, and is part of year-long series; see HIST 2041.

2041. Modern China. 3. Surveys China's social, intellectual, political, cultural, and ethnohistory from mid-1800s to the present. Themes include colonialism, emergence of nation-state, Communist party, Mao's socio-political agenda, post-Mao reforms, and China's role in Asia. Background for other Asia-related courses, and part of year-long series; see HIST 2040.

2050. Introduction to Public History. 3. Introduces the student to the non-teaching, professional uses of history. Topics for consideration include archival work, museum management, public information and publications, historic site development, oral history interviewing, preparation of government reports, historic preservation general concepts and historical programming.

2060. Topics in History. 2-3 (Max. 6). Discusses special topics that fall outside traditional chronological and geographical framework

of history; content varies from semester to semester in accordance with faculty interest and student demand.

2080 [4315]. Holocaust. 3. [CH♦♦(none)] Surveys the destruction of European Jewry, 1933-1945. Cross listed with RELI 2080.

2105 Medieval Europe in Film. 3. Historical depictions in films help to shape people's view of the past. Uses commercial films to study major themes in the development of western European civilization between 500 and 1500. Students view, discuss and write about films, learning to evaluate films historically and to view films critically, developing media literacy.

2120. Ancient Greece and the Near East. 3. Examines development of civilization in Eastern Mediterranean from prehistory to Alexander the Great. (Normally offered fall semester)

2130. Ancient Rome. 3. Studies history of the growth of Roman power from city-state to world power.

2225. History of Christianity. 3. Traces Christianity from its beginnings to late 20th century. Cross listed with RELI 2225.

2230. The History of Russia to 1855. 3. General survey of modern Russian history from earliest times to 1855.

2240. The History of Russia Since 1855. 3. General survey of modern Russian history from 1855 to the present.

2250. American Religious History I (To 1865). 3. [CH,D♦♦H] Traces the history of religion in America through the Civil War. We will pay particular attention to the intertwining of religion and colonialism; the tension between emerging Protestant hegemony and religious pluralism; and the roles religion has played in justifying oppression and pursuing liberty in American history. Cross listed with RELI 2250.

2252. American Religious History II (1865-1945). 3. [CH,D♦♦H] Traces American religious history from the Civil War through WWII. Focuses on how race/ethnicity, class, gender, and national origin affected religion, and explores how Americans used religion in oppressing and liberating people; marking and erasing difference; and exporting values abroad as well as reforming society at home. Cross listed with RELI 2252.

2280. Introduction to European Studies. 3. [(none)♦♦COM2] This class explores the historical development of notions of community and difference, territories and borders, race and identity, and nationalism and post-national integration in Europe between 1789 and the present. It draws upon history, politics, geography, cultural studies, and anthropology. Cross listed with INST 2280.

2290. History of North American Indians. 3. [CH,D♦(none)] Studies American Indian history through 500 years and across the continent. Considers Indian political, social and economic continuity and change. Focuses on how Indian peoples experienced and responded to times of dramatic change. Cross listed with NAIS 2290.

2315. History of Non-Western Religions. 3. [CH,G♦(none)] Introduces students to religions outside the Judeo-Christian realm familiar in the west. Each religion analyzed in its world views, its ways of life, and in its social organization. History of each religion and its changes. Cross listed with RELI 2315.

2320. History of Islam. 3. [CH,G♦COM2] Focuses on the origins of Islam and its early formation, its growth and spread across the world, and its intellectual, spiritual and historical character. Time will also be spent on the formation of Islam in the modern world and how that impacts the views and actions of its members.

2360. African-American History. 3. [CH,D♦COM2] Surveys African-American history in America, particularly emphasizing issues of identity, class, and progress as well as exploring African-Americans' quest for full participation in American life. Cross listed with AAST 2360.

2370. Chicano History: Origins to 1900. 3. [CS,D♦H] General survey of the history of the Mexican American Chicano people in the United States. Examines the origins and development of Mexican Americans, Chicanos through the major historical processes which have shaped their experience. Major themes include multicultural, multiethnic context, origins; changing identity, comparative relations to other social, ethnic groups, culture, social structure, politics, economy, immigration, and the influence of United States-Mexico relations. Cross listed with LTST/GEOG 2370.

2380. Latin American History 1500-2000. 3. [G♦H] Provides introduction to Latin American history, from colonial contacts to the present. Explores important themes and connections across the colonial and modern periods, such as race, national identity, foreign involvement, indigenous peoples' role in nation-states, religion, social movements, economic systems, and globalization.

2385. Chicano History : 1900 to Present. 3. General survey of the history of the Mexican American Chicano people in the United States. Examines the origins and development of Mexican Americans, Chicanos through the major historical processes which have shaped their experience. Major themes include multicultural, multiethnic context, origins; chang-

ing identity, comparative relations to other social, ethnic groups, culture, social structure, politics, economy, immigration, and the influence of United States-Mexico relations. Cross listed with LTST 2385.

2389. History of Women in the American West. 3. [D♦(none)] Surveys the roots of society's marginal historical depiction of women in the American West from the colonial period through the twentieth century. From the perspective of race, class, ethnicity, and gender, the course focuses on the development of a multi-dimensional understanding of women's roles using an interdisciplinary approach. Cross listed with WMST 2389.

2390. US West Between the World Wars. 3. Examines two pivotal decades (1918-1942) in the US West that encompasses prosperity, Depression, and reform, through the use of historical documents, art, film, literature, and music.

2460. Traditional Japan. 3. Surveys Japan's social, intellectual, political, cultural, technological and ethnohistory from earliest historical period to the 1800s. Topics include roles of China and Korea, the samurai warrior tradition, family structure, Buddhism and Shinto. Provides background for other Asia-related courses, and is part of a year-long series; see HIST 2461.

2461. Modern Japan. 3. Surveys Japan's social, intellectual, political, cultural, economic, technological and ethnohistory from the 1800s through the present. Topics include Japan's industrialization, Asian colonialism, post-WWII, and Japan as economic superpower. Provides background for other Asia-related courses, and is part of a year-long series; see HIST 2460.

2470. Civilization of India. 3-4 (Max. 4). Surveys Indian civilization from earliest times, including cultural aspects.

2500. The Impact of the Union Pacific on Wyoming History. 3. Students experience and interpret the impact of the building of the Union Pacific Railroad on the history and culture of Wyoming through the lens of three disciplinary perspectives. Students explore how the railroad impacted Wyoming geography, economic development and the people of the state through personal research projects. Cross listed with ECON 2500.

2600. Forgotten Africa: Intro to African Civilizations. 3. [(none)♦H] This survey course introduces students to African states and empires, dating from classical to modern times. The course challenges depictions of Africa as timeless and underdeveloped within contemporary narratives by highlighting the continent's vibrant cultures, sophisticated

technologies, dynamic and complex political systems and participation in long-distance trade. Cross listed with ANTH 2600.

2700. Introduction to Museology. 3. [CH♦(none)] Explores the historical, cultural, and contemporary roles of museums and preservation institutions in society. Introduces students to the museum professions, collection and exhibition installation strategies, and ethical problems of governance and collection. Field trips to regional collections are included. Cross listed with ART/AMST/ANTH 2700.

3000. Plains Culture and History. 3. [D♦(none)] An ethnohistorical study of those Native peoples inhabiting the plains region of the U.S. from prehistory to the present. Cross listed with NAIS 3000. *Prerequisite:* 6 hours of HIST or NAIS.

3020 [4020]. Historical Methods. 3. [WB,L♦(none)] An introduction to the concepts, methods, and techniques used by historians. The main emphasis will be on methods of historical research and analysis, demonstrated through writing. Students will write a number of short papers building skills in various areas of research, analysis, and argumentation, and one longer paper reflecting individual research. Total pages for the semester: 30-45. *Prerequisites:* junior standing, 12 hours of HIST, and COM1.

3050. Athenian Democracy. 3. Examines democratic government in ancient Athens: its origins and development, its practical workings, how politics were conducted and power was gained and exercised, citizen participation, law courts, and evaluations of democracy in the ancient world and since. Cross listed with CLAS/POLS 3050. *Prerequisite:* WB or COM2.

3110. Modern Germany. 3. A cultural, social, and political history of German-Speaking Europe from 1789 to the present. *Prerequisite:* 6 hours of HIST or INST.

3160. "What Killed Socrates?". 3. This course will reexamine Socrates' trial in 399 BCE, widely regarded as a miscarriage of justice, in its total historic context, seeking to understand the reasons for Socrates' conviction. In the process, it will impart a broad understanding of the cultural, philosophical, political, and legal life of classical Athens. Cross listed with CLAS/PHIL 3160. *Prerequisite:* WB or COM2.

3220. History of the Modern Middle East. 3. [G♦(none)] Surveys the Middle East from 1700 to the present. Emphasizes the demise of the Ottoman Empire, the rise of domination by European colonial powers, transformations in political, social, religious and cultural life, the rise of nationalist movements, the influence of oil, the growth of Islamist political groups

and the Israeli-Palestinian conflict. Cross listed with RELI 3220. *Prerequisite:* 6 hours of HIST, RELI, or INST.

3230. Early Christianity. 3. Considers the development of the Christian religion from a small Jewish sect to its place as the official religion of the Roman Empire and beyond. It examines the development of creeds, doctrines and institutions, placing them within their historical context. *Prerequisite:* RELI 1000, RELI/HIST 2225, or HIST 2113.

3235. Medieval Christianity. 3. Traces the development of 'Christendom' in Europe between about 500 - 1500 CE, concentrating on the Latin West. It examines the growth of Christian institutions and practices, the Church's role as sole governing entity, along with conflicts with secular governments as they developed in later centuries. Cross listed with RELI 3235. *Prerequisites:* RELI/HIST 2225, HIST 1110, or RELI 1000.

3240. Reformation and Enlightenment Christianity. 3. The years between about 1500 and 1800 saw the permanent dismantling of Christianity in the West as a unified force, as Protestantism brought new ways of viewing the relationship between God and humanity. Once the fragmentation began, it accelerated rapidly as Enlightenment thinking challenged Christianity in new and complex ways. Cross listed with: RELI 3240. *Prerequisites:* RELI 1000, RELI/HIST 2225.

3275. World Christianities. 3. [CH,G◀(none)] Examines the development of Christianity primarily in Africa, Asia and South America. Cross listed with RELI 3275. *Prerequisites:* WB and CH.

3300. Secret History of Science. 3. Explores developments in science from prehistory to the present. It focuses on the lesser-known men and women who contributed to science, as well as on seemingly superstitious beliefs that were nonetheless important to advances in knowledge. Restricted to junior standing or higher. *Prerequisite:* 6 hours in HIST or 6 hours of PN coursework, or a combination of both.

3400. Mongol Empire. 3. Examines the history of the Mongol Empire from a world history perspective. Major themes: structure of a nomadic empire, how that empire interacted with the various settled states it conquered and ramifications of the Mongol conquest on trade, technology, and social and intellectual developments across Eurasia, between the years 1200 to 1450 ce. *Prerequisite:* 6 hours of HIST.

3500. Colonial America. 3. This course covers the history of European colonization from roughly 1492 to 1763. Our geographic focus will be on the (future) United States, but will

also learn how transatlantic forces influenced its people. *Prerequisite:* 12 hours of HIST courses or permission of instructor.

3670. African Diaspora. 3. Examines process through which aspects of African culture have endured in Diaspora. Analyzes social relations between Diaspora Africans and non-African populations in N. and S. America, the Caribbean, Britain, Asia and the Mediterranean. Discusses cultural hybridization as a product of culture contact. Cross listed with AAST 3670. *Prerequisite:* AAST 1000, any AAST 2000-level course, or AAST/HIST 2360.

3880. Comparative History. 3. Explores comparative history from a variety of topics, such as colonialism, memory, nationalisms, frontiers, or cultural history. This course will introduce students to at least one of these themes from at least two regions, time periods, or groups of people to understand patterns and change in human societies through time. *Prerequisite:* 6 hours of HIST.

4000. Indians of Wyoming. 3. [D◀(none)] Examines Native American culture in Wyoming from pre-history to the 21st century. Analyzes social, political, and economic developments of Native peoples of Wyoming before, during, and after contact with Europeans. Discusses interaction between these diverse societies and explores the changing relationships between Indians and Euro-Americans through the periods after contact. Cross listed with NAIS 4000. *Prerequisite:* 9 hours of HIST or NAIS.

4020. The Black West. 3. [CH,D◀(none)] This course explores the historical experiences and contributions of people of African descent to the American West from their earliest recorded presence in the 16th Century through the present. Cross listed with AAST 4020. *Prerequisites:* AAST 1000, any AAST 2000-level course, junior/senior standing, or three hours of any level of HIST course.

4030. Senior Capstone Seminar. 3 (Max. 6). [WC◀COM3] For undergraduate departmental majors; presented in a small group, non-lecture setting. Under close instructor supervision, students write reviews and essays, present critiques and oral reports and lead discussion on materials read by class. *Prerequisite:* advanced standing as a History major and HIST 3020.

4055. Archival Research Methods. 3. Students will master advanced research strategies with interdisciplinary applications. Focuses on primary research and the development of advanced skills in information literacy, critical analysis of sources, verification of evidence, techniques for researching underdocumented populations, and interpretation of historical evidence. Advanced writing and oral pre-

sentation skills are emphasized. Dual listed with HIST 5055. *Prerequisite:* 9 hours of HIST, including 2050 or HIST 2700.

4060. Independent Study. 1-3 (Max. 6). Credit not to exceed 6 hours maximum, to be arranged in either European or American history. Primarily for juniors and seniors who can profit from independent work with minimal supervision. *Prerequisites:* 12 semester hours in history; written permission of instructor required.

4077. Book History: Topics. 3 (Max. 6). An in-depth, hands-on study of books within their historical contexts. The topic will vary each time and focus on a particular theme, time period, place, or culture. Taught at the Rare Books Library, American Heritage Center, using original books or facsimiles. May be repeated once for credit. Dual listed with HIST 5077. *Prerequisite:* 9 hours of HIST.

4100. Early Medieval Europe. 3. Studies development of European civilization from decline of Rome to 12th century. Dual listed with HIST 5100. *Prerequisite:* 9 hours of HIST.

4110. The High Middle Ages. 3. Studies history of European civilization between the 12th and 15th centuries. Dual listed with HIST 5110. *Prerequisite:* 9 hours of HIST.

4112. History of the Medieval City. 3. After the fall of the Western Roman Empire, cities virtually disappeared from Western Europe. Around 1000 Europe began its rise to world prominence and cities contributed to that rise. Examines development of cities in medieval Europe and explores life within those cities. Dual listed with HIST 5112. *Prerequisite:* 9 hours of HIST.

4113. Medieval Religious Dissent. 3. Religious dissent in the Middle Ages included what some would call heresy, but also encompasses such marginal groups as Jews and witches. Examines development of orthodoxy and persecution of religious diversity between eleventh and 16th centuries within the historical context of the times. Dual listed with HIST 5113. Cross listed with RELI 4113. *Prerequisite:* 9 hours of HIST or RELI.

4120. Europe During the Renaissance. 3. Intensely studies European history in 14th and 15th centuries. *Prerequisite:* 9 hours of HIST.

4130. Europe During the Reformation. 3. Intensely studies European history in the 16th century. *Prerequisite:* 9 hours of HIST.

4140. Europe During the Age of the Baroque. 3. Intensely studies European history in 17th century. *Prerequisite:* 9 hours of HIST.

4150. Europe During the Age of the Enlightenment. 3. Intensely studies European history in 18th century. *Prerequisite:* 9 hours of HIST.

4170. Europe in the Nineteenth Century.

3. An intensive study of European history from the beginning of the nineteenth century through to the origins of the First World War in 1914. Dual listed with HIST 5170. *Prerequisite:* HIST 1120.

4174. Judaism from Ezra to Jesus. 3. This course focuses on the religious and historical development of Judaism during the centuries between the end of the Old Testament and the New Testament, studying the arrival of Greek and then Roman culture and the changes Judaism underwent during that time that endure today. Cross listed with RELI 4174. *Prerequisites:* WB or COM2, and RELI 1000 or RELI 2110.

4175. Judaism at the Dawn of Christianity.

3. Judaism is the only Mediterranean religion that was practiced in the ancient world as well as in Late Antiquity and beyond. This course helps students analyze how Judaism was able to change and adapt at key moments to provide its adherents with an active, living religion that addressed their needs. Cross listed with RELI 4175. *Prerequisites:* RELI 1000 or RELI 2110, and junior standing.

4180. Europe in the 20th Century. 3.

An intensive study of European history from 1914 through 2000. Dual listed with HIST 5180. *Prerequisite:* 9 hours of HIST.

4270. France: Old Regime and Revolution.

3. The social, political and cultural history of early modern France (1598-1789), from the rise of the Absolutist state under Louis XIV to the outbreak of the Revolution. Explores the cultural and intellectual shifts from court culture at Versailles, to the Enlightenment, to the rise of revolutionary ideologies. Dual listed with HIST 5270. *Prerequisite:* 9 hours of HIST.

4290. History of the Soviet Union. 3.

Depicts Russia under Communism, including particularly the development of totalitarian dictatorship in its political, economic, social and cultural manifestations. Dual listed with HIST 5290. *Prerequisite:* 9 hours of HIST. (Offered based on sufficient demand and resources)

4305. Global History. 3. [G◀(none)]

Thematically focused examinations of interactions or parallel phenomena in multiple world regions. Courses may be comparative (comparing two empires, or multiple revolutions), or may examine the growth of a particular trend globally (e.g. abolition of slavery), or the interaction of many states (e.g. the Cold War). Dual listed with HIST 5305. *Prerequisite:* 9 hours of HIST, INST, or POLS.

4310. World War II in Europe. 3.

Covers the origins, course and consequences of one of this century's defining global developments. World War II in Europe was a transnational develop-

ment which shaped the world as it is known today. Dual listed with HIST 5310. *Prerequisite:* 9 hours of HIST.

4315. History, Politics and Memory of the Holocaust in Europe. 3.

Offers students the opportunity to learn about the history of the Holocaust through travel to various sites in Central Europe where the events themselves occurred, such as Berlin, Warsaw, Krakow and Auschwitz-Birkenau. Dual listed with HIST 5315. Cross listed with INST 4315. *Prerequisites:* 9 hours of HIST or INST.

4320. Memory and National Identity in Twentieth Century Europe. 3.

Europe in the twentieth century saw a century of unprecedented violence. Examines the public representation of such historical trauma through the concept of "collective memory" and focuses in particular on how memory has become a contested part of defining identity in modern-day Europe. Dual listed with HIST 5320. *Prerequisite:* 9 hours of HIST.

4330. European Gender and Women's History. 3.

The experiences of women and the history of gender from the Renaissance through the 19th century. Focuses on the changing notions of the masculine and the feminine through such historical episodes as the Reformation, the Enlightenment, the French Revolution and the Industrial Revolution. Cross listed with WMST 4330. *Prerequisite:* 9 hours of HIST.

4335. Women and Islam. 3.

Examines women's lives in Islamic societies from the seventh century to the present in the Middle East and throughout the world. Themes include women's position in Islamic law, society and culture, Western images of Muslim women, veiling and Islamist movements, theoretical readings on power, gender and agency. Cross listed with RELI 4335 and WMST 4335. *Prerequisite:* 9 hours of HIST, WMST, INST, or RELI.

4340 [4840]. The Social History of American Women. 3. [(none)◀H]

Explores everyday life experiences of American women from the 17th century to the present. Focuses on the complex influence of gender, race and class in shaping those experiences; also, analyzes the ways in which women's dissatisfaction with their position in society formed the basis for the development of American feminism and led to the formation of an organized women's movement. Dual listed with HIST 5340. *Prerequisite:* 9 hours of HIST or WMST.

4380. International History of Human Rights. 3.

Examine the modern history of human rights in the global system, with particular emphasis on developments since the Second World War. Topics include the philosophy of human rights ideas; the histories of rights and

rights violations in various regions; and the resulting international responses. Dual listed with HIST 5380; cross listed with INST 4380. *Prerequisites:* 9 hours of HIST or INST.

4400. Internship. 1-12 (Max. 12).

The internship allows students to gain hands-on experience that will help to bridge the gap between history as an academic discipline and history as practiced in museums, public history agencies and historic sites. Specific arrangements must be made in advance to identify the academic component of the internship and the grading criteria. Such planning will be done in consultation with the department's internship director. *Prerequisite:* 9 hours of HIST.

4405. American Encounters to 1850. 3.

[D◀H] The history of America as a history of continuous encounters. Examines the history of the American people by focusing on a series of critical encounters between Native American, European, African and Asian people from pre-contact through the mid-19th century. Dual listed with HIST 5405. *Prerequisite:* 9 hours of HIST.

4406. American Encounters from 1850. 3.

[D◀H] The history of America as a history of continuous encounters. Examines the history of the American people by focusing on a series of critical encounters between Native American, European, African, and Asian people from the mid-19th century to the present. *Prerequisite:* 9 hours of HIST.

4410. America in an Early Modern World. 3.

[CS,G◀H] Explores the American colonial experience as part of a worldwide process of colonial encounters with indigenous peoples between 1400 and 1800. Compares the experiences of early modern colonization in North and South America, Asia, and the Pacific and examines the nature of the colonial societies created by these cross-cultural relationships. Dual listed with HIST 5410. *Prerequisite:* 9 hours of HIST.

4412. Global Environment History. 3.

[(none)◀>H] This course is designed to introduce undergraduate and graduate students to the new field of global environmental history. The Global Environment History course will provide a new way of looking at humans, animals, and the lives they've built in the environment and the costs of their decisions to the environment. Dual listed with HIST 5412; cross listed with ENR 4412. *Prerequisite:* 9 hours of HIST or ENR.

4415. Entangled Worlds, Entangled Lives: Indigenous People and Colonizers Before 1850. 3. [CS, G◀H]

The experiences of indigenous people and colonizers in Africa, Eurasia, the Americas, and the Pacific as they forged new colonial societies in the first global

age (1400-1850). Emphasis throughout the course will be on the often-overlooked role of indigenous people in creating colonial societies. Dual listed with HIST 5415. *Prerequisite:* 9 hours of HIST.

4425. Britain's Global Empires: 1558 to the Present. 3. Britain's four distinctive empires from Elizabeth I through the present. Emphasis throughout the course will be on the creation and operation of these distinctive but related empires with a special focus on the impact empires had on both colonized people and the people of Britain. Dual listed with HIST 5425. *Prerequisite:* 9 hours of HIST.

4450. The Civil War and Reconstruction. 3. Studies crisis of the Union, 1861- 1877. Examines experiences of both the North and South during the Civil War and restoration of the Union after the war. Dual listed with HIST 5450. *Prerequisite:* 9 hours of HIST.

4460. Post-Civil War America: The Gilded Age. 3. Intensively covers economic, cultural and political developments which marked the U.S. in post-Civil War era, such as rise of industry, emergence of distinctive national culture and party struggles shaping America's Gilded Age. Dual listed with HIST 5460. *Prerequisite:* 9 hours of HIST.

4462. American Indian History to 1783. 3. [(none)◀▶H] Surveys the history of American Indians from the period before contact to the end of the American Revolution. Examines the various contacts between American Indians and Europeans and considers what the American Revolution meant to the continent's Native peoples. Dual listed with HIST 5462; cross listed with NAIS 4462. *Prerequisite:* 9 hours of HIST or NAIS.

4463. American Indian History 1783-1890. 3. Surveys the history of American Indians during the era of westward expansion. Examines the impact of American westward movement and also the manifold changes that accompanied moving west. Dual listed with HIST 5463; cross listed with NAIS 4463. *Prerequisite:* 9 hours of HIST or NAIS.

4464. American Indians in the Twentieth Century. 3. [(none)◀▶H] Surveys the history of American Indians during the twentieth century. Examines the development of new cultural, social and political forms that help create an American Indian identity. Dual listed with HIST 5464; cross listed with NAIS 4464. *Prerequisite:* 9 hours of HIST or NAIS.

4466. American Indian Ethnohistory. 3. Surveys ethnohistorical methods and concepts and provides students concrete opportunities to use these methodologies in writing exercises. American Indian ethnohistory explores

Native American experiences within their own cultural contexts. Cross listed with NAIS 4466.

Prerequisite: 9 hours of HIST, NAIS, or ANTH.

4468. American Indians in the North American West. 3. One of the defining features of the North American West is the presence of American Indians. Through the discussion of varied readings and primary document research, the history of American Indians in the West is examined, with particular emphasis on the Great Plains and California. Cross listed with NAIS 4468. *Prerequisite:* 9 hours of HIST or NAIS.

4470. The Birth of Modern America, 1890-1929. 3. Studies political and diplomatic developments in the U.S. in the wake of industrialization and massive immigration. Some attention to cultural and social themes. Emphasizes shifting nature of reform between depression of the 1890s and that of the 1930s. Dual listed with HIST 5470. *Prerequisite:* 9 hours of HIST.

4475 [4670]. American Environmental History. 3. Explores history of American attitudes and actions toward the land and natural resources. Dual listed with HIST 5475. *Prerequisite:* 9 hours of HIST.

4480. Growth of Modern America, 1929-1960. 3. Studies political and diplomatic developments in the U.S. in Depression, World War II and early Cold War periods. Some attention to cultural and social themes. Emphasizes economic crisis, growth of government, reform traditions, anti-communism and civil rights. Dual listed with HIST 5480. *Prerequisite:* 9 hours of HIST.

4485. U.S. Latino Diaspora. 3. Combines classroom activities and a week-long stay abroad in examining the historical creation and contemporary spread of the Latino Diaspora from the Caribbean to the Yucatan and beyond. U.S. Latina/o history, multiculturalism, pan-Latino identity, assimilation, migration trends and natives responses are stressed. Cross listed with LTST/INST 4485. *Prerequisite:* 9 hours of LTST, HIST, and/or INST related coursework.

4490. Modern America, 1960-Present. 3. Studies political and diplomatic aspects of the U.S. since 1960. Emphasizes impact of Cold War, social and political tensions at home, civil rights and government policies. Dual listed with HIST 5490. *Prerequisite:* 9 hours of HIST.

4492. Revolutions in Latin America. 3. [CS,G◀▶(none)] Explores the meaning and impact of revolution in Latin America's modern history, focusing on political ideology, cultural expression, foreign relations, human rights, and globalization. Offers in-depth anal-

ysis of revolutions from the early nineteenth century to the present. Cross listed with LTST 4492; dual listed with HIST 5492. *Prerequisite:* 9 hours of HIST or INST.

4494. The U.S. in Latin America. 3. [(none)◀▶H] This course explores Latin America's experiences with the United States during the twentieth century. The class addresses U.S.-Latin American relations from a variety of angles, covering topics from military intervention and government policies, to informal imperialism and cultural exchanges through film and literature. Dual listed with HIST 5494. *Prerequisite:* 9 hours of HIST or INST.

4495 [4720]. Borderlands in Latin America. 3. Examines borderlands and frontiers in Latin American history, focusing on the U.S.-Mexico border region, the Southern Cone, and the Caribbean. Key issues include cultural contact zones, colonialism, military expansion and conflict, and nation-building. Dual listed with HIST 5495. *Prerequisite:* 9 hours of HIST or INST.

4496 [4800]. History of Mexico. 3. Intensive course in Mexican development. Emphasizes the 20th century especially the Mexican Revolution of 1910, showing how this nation transformed itself into a modern nation-state. Includes diplomatic relations with the U.S., incorporation of Indians, church-state relations, uses of land and other natural resources, role of the military and growth of Mexican nationalism. Dual listed with HIST 5496; cross listed with LTST 4496. *Prerequisite:* 9 hours of HIST or INST.

4505 [4500]. The Old South, 1820-1861. 3. Studies history of the South from emergence of southern identity to the Civil War. Emphasizes southern society and culture. Dual listed with HIST 5505. *Prerequisite:* 9 hours of HIST.

4510 [4950]. Modern East Asia. 3. Focuses on the emergence of the modern East Asian states China, Japan, Korea and Vietnam as individual states and members of this important region historically and in contemporary era, understanding the emergence of those states as responses to internal forces and external pressures such as imperialism, nationalism, Communism and Capitalism. Dual listed with HIST 5510. *Prerequisite:* 9 hours of HIST.

4515 [4710]. American Legal History. 3. An intensive course in the history of American law, the judicial system, the legal profession and legal administration from colonial times to the present. Dual listed with HIST 5515. *Prerequisite:* 9 hours of HIST.

4530 [4630]. 19th Century American West.

3. A study of the westward movement with emphasis on the trans-Mississippi West. Dual listed with HIST 5530. *Prerequisite:* 9 hours of HIST.

4535. History of Oil. 3. Intensive study of the history of oil development throughout the world. Emphasizes comparative studies of the industry as it developed in various parts of the world and during various time periods, from pre-historic times to the present. The Wyoming oil/energy mineral history is an important component. Dual listed with HIST 5535. *Prerequisite:* 9 hours in history.

4540 [4640]. 20th Century American West.

3. A study of the modern American West, with consideration of social, economic and political continuity and change. Dual listed with HIST 5540. *Prerequisite:* 9 hours of HIST.

4545. The Multicultural West. 3. Explores the American West as a meeting ground of diverse peoples and their diverse cultures. Focuses on the sustained cross-cultural interchange between Native Americans, Euro-Americans, African Americans, Latin Americans, and Asian Americans from trans-Appalachia to the Pacific Coast from the eighteenth century to the present. *Prerequisite:* 9 hours of HIST.

4560. American Social History in the 20th Century. 3. Explores history of social mobility and conflict in 20th century. Emphasizes impact of industrialization, rapid urbanization, massive immigration, ethnic minorities, race, religion, women and the family, painting and architecture. Dual listed with HIST 5560. *Prerequisite:* 9 hours of HIST.

4582. 20th Century U.S. Foreign Relations.

3. Studies Twentieth Century United States foreign relations with a focus on the Cold War period. Examines economic sources of policy decisions, elites and mass public opinion, as well as cultural, religious, ethnic, racial, and gender issues. Cross listed with INST 4582; dual listed with HIST 5582. *Prerequisite:* 9 hours of HIST or INST.

4610. Seminar Topics in the History of Wyoming I. 3.

An intensive research and writing course dealing with topics in the period before statehood in 1890. *Prerequisite:* 9 hours of HIST, including HIST 1251.

4620. Seminar Topics in the History of Wyoming II. 3.

Allows students to do intensive research and writing dealing with topics in Wyoming history from 1890 to present. *Prerequisite:* 9 hours of HIST, including HIST 1251.

4965. Senior Thesis. 3. Working closely with a faculty advisor, a history major will develop a research proposal that, after approval by the History department faculty, will lead to in-depth research and writing, producing a

minimum 50-page thesis that demonstrates an excellent grasp of historical methods and a high degree of writing skill. *Prerequisites:* 12 hours of HIST; senior class standing; HIST major.

4990 [4080]. Topics in _____. 1-6 (Max. 12). Affords students opportunity to study in-depth various topics in history not offered in regular courses or independent study. *Prerequisite:* 9 hours of HIST.

5000. Indians of Wyoming. 3. Examines Native American culture in Wyoming from pre-history to the 21st century. Analyzes social, political, and economic developments of Native peoples of Wyoming before, during, and after contact with Europeans. Discusses interaction between these diverse societies and explores the changing relationships between Indians and Euro-Americans through the periods after contact. Dual listed with HIST 4000; cross listed with NAIS 4000. *Prerequisite:* 6 hours of HIST or NAIS.

5055. Archival Research Methods. 3. Students master advanced research strategies with interdisciplinary applications. Focuses on primary document research and the development of advanced skills in information literacy, critical analysis of sources, verification of evidence, techniques for researching under-documented populations, and interpretation of historical evidence. Advanced writing and oral presentation skills are emphasized. *Prerequisite:* graduate standing.

5077. Book History: Topics. 3. An in-depth, hands on study of books within their historical contexts. The topic varies each time, and focuses on a particular theme, time period, place, or culture. Taught at the Rare Books Library, American Heritage Center, using original books or facsimiles. May be repeated once for credit. *Prerequisite:* graduate standing.

5100. Early Medieval Europe. 3. The study of the development of European civilization from the decline of Rome to the twelfth century. Dual listed with HIST 4100. *Prerequisite:* graduate standing.

5110. The High Middle Ages. 3. Studies history of European civilization between the 12th and 15th centuries. Dual listed with HIST 4100. *Prerequisite:* graduate standing.

5112. History of the Medieval City. 3. After the fall of the Western Roman Empire, cities virtually disappeared from Western Europe. Around 1000, Europe began its rise to world prominence, and the birth of the cities contributed to that rise. This course examines the development of cities in medieval Europe and explores life within those cities. Dual listed with HIST 4112. *Prerequisite:* graduate standing.

5113. Medieval Religious Dissent. 3. Religious dissent in the Middle Ages included what we would call heresy, but also encompasses such marginal groups as Jews and witches. This course examines development of orthodoxy and the persecution of religious diversity between the 11th and 16th centuries. It also studies the historical context of the times. Dual listed with HIST 4113; cross listed with RELI 4113. *Prerequisite:* graduate standing.

5170. Europe in the 19th Century. 3. An intensive study of European history from the beginning of the nineteenth century through to the origins of the First World War in 1914. *Prerequisite:* graduate standing.

5180. Europe in the 20th Century. 3. An intensive study of European history from 1914 through 2000. Dual listed with HIST 4180. *Prerequisite:* graduate standing.

5270. France: Old Regime and Revolution.

3. The social, political and cultural history of early modern France (1598-1789), from the rise of the Absolutist state under Louis XIV to the outbreak of the Revolution. Explores the cultural and intellectual shifts from court culture at Versailles, to the Enlightenment, to the rise of revolutionary ideologies. *Prerequisite:* graduate standing.

5290. History of the Soviet Union. 3. Russia under Communism, including particularly the development of totalitarian dictatorship in its political, economic, social, and cultural manifestations. Dual listed with HIST 4290. *Prerequisite:* graduate standing.

5305. Global History. 3. Thematically focused examinations of interactions or parallel phenomena in multiple world regions. Courses may be comparative (comparing two empires, or multiple revolutions), or may examine the growth of a particular trend globally (e.g. abolition of slavery), or the interaction of many states (e.g. the Cold War). Dual listed with HIST 4305. *Prerequisite:* graduate standing.

5310. World War II in Europe. 3. Covers the origins, course, and consequences of one of this century's defining global developments. World War II in Europe was a transnational development which shaped the world as we know it today. Dual listed with HIST 4310. *Prerequisite:* graduate standing.

5315. History, Politics and Memory of the Holocaust in Europe. 3. Offers students the opportunity to learn about the history of the Holocaust through travel to various sites in Central Europe where the events themselves occurred, such as Berlin, Warsaw, Krakow and Auschwitz-Birkenau. Dual listed with HIST 4315. Cross listed with INST 5315. *Prerequisites:* graduate standing.

5320. Memory and National Identity in 20th Century Europe. 3. Europe in the twentieth century saw a century of unprecedented violence. Examines the public representation of such historical trauma through the concept of “collective memory” and focuses in particular on how memory has become a contested part of defining national identity in modern-day Europe. *Prerequisite:* graduate standing.

5340. The Social History of American Women. 3. Explores the everyday life experiences of American women from the seventeenth century to the present with a focus on the complex influence of gender, race, and class in shaping those experiences. The course then turns to an analysis of the ways in which woman’s dissatisfaction with the position in society formed American feminism and lead to the formation of an organized women’s movement. Dual listed with HIST 4340. *Prerequisites:* graduate standing.

5380. International History of Human Rights. 3. Examine the modern history of human rights in the global system, with particular emphasis on developments since the Second World War. Topics include the philosophy of human rights ideas; the histories of rights and rights violations in various regions; and the resulting international responses. Dual listed with HIST 4380; cross listed with INST 5380. *Prerequisites:* 9 hours of HIST or INST.

5381. Seminar in Recent United States History. 3 (Max. 12). *Prerequisite:* graduate standing.

5400. Graduate Topics in History. 1-6 (Max. 12). Opportunity to study in-depth various topics in history not offered in regular graduate seminars or graduate reading courses. *Prerequisite:* graduate standing.

5405. American Encounters to 1850. 3. The history of America as a history of continuous encounters. Examines the history of the American people by focusing on a series of critical encounters between Native American, European, African, and Asian people from pre-contact to the mid-19th century. *Prerequisite:* graduate standing.

5406. American Encounters from 1850. 3. The history of America as a history of continuous encounters. Examines the history of the American people by focusing on a series of critical encounters between Native American, European, African, and Asian people from the mid-19th century to the present. Dual listed with HIST 4406. *Prerequisite:* graduate standing.

5410. America in an Early Modern World. 3. Explores the American colonial experience as part of a worldwide process of colonial encounters with indigenous peoples between 1400 and 1800. Compares the experiences of

early modern colonization in North and South America, Asia, and the Pacific and examines the nature of the colonial societies created by these cross-cultural relationships. Dual Listed with HIST 4410. *Prerequisite:* graduate standing.

5412. Global Environment History. 3. [(none)<>H] This course is designed to introduce undergraduate and graduate students to the new field of global environmental history. The Global Environmental History course will provide a new way of looking at humans, animals, and the lives they’ve built in the environment and the costs of their decisions to the environment. Dual listed with HIST 4412. *Prerequisite:* graduate standing.

5415. Entangled Worlds, Entangled Lives: Indigenous People and Colonizers Before 1850. 3. The experiences of indigenous people and colonizers in Africa, Eurasia, the Americas, and the Pacific as they forged new colonial societies in the first global age (1400-1850). Emphasis throughout the course will be on the often-overlooked role of indigenous people in creating colonial societies. Dual listed with HIST 4415. *Prerequisite:* graduate standing.

5425. Britain’s Global Empires: 1558 to the Present. 3. Britain’s four distinctive empires from Elizabeth I through the present. Emphasis throughout the course will be on the creation and operation of these distinctive but related empires with a special focus on the impact empires had on both colonized people and the people of Britain. Dual listed with HIST 4425. *Prerequisite:* graduate standing.

5450. The Civil War and Reconstruction. 3. A study of the crisis of the Union, 1861-1877. Examination of the experiences of both the North and the South during the Civil War and restoration of the Union after the war. Dual listed with HIST 4450. *Prerequisite:* graduate standing.

5460. Post-Civil War America: The Gilded Age. 3. An intensive study in the economic, cultural, and political developments which marked the U.S. in post-Civil War era, the rise of industry, the emergence of a distinctive national culture and the party struggles that shaped America’s Gilded Age. Dual listed with HIST 4460. *Prerequisite:* graduate standing.

5462. American Indian History to 1783. 3. Surveys the history of American Indians from the period before contact to the end of the American Revolution. Examines the various contacts between American Indians and Europeans and considers what the American revolution meant to the continent’s Native peoples. Dual listed with HIST 4462; cross listed with NAIS 5462. *Prerequisite:* graduate standing.

5463. American Indian History to 1890. 3. Surveys the history of American Indians during the era of westward expansion. Examines the impact of American westward movement and also the manifold changes that accompanied Indians moving west. Dual listed with HIST 4463; cross listed with NAIS 5463. *Prerequisite:* graduate standing.

5464. American Indians in the 20th Century. 3. Surveys the history of American Indians during the twentieth century. Examines the development of new cultural, social and political forms that help create an American Indian identity. Dual listed with HIST 4464; cross listed with NAIS 5464. *Prerequisite:* graduate standing.

5470. The Birth of Modern America, 1890-1929. 3. Studies political and diplomatic developments in the U.S. in the wake of industrialization and massive immigration. Some attention to cultural and social themes. Emphasizes shifting nature of reform between the depression of the 1890s and that of the 1930s. Dual listed with HIST 4470. *Prerequisite:* graduate standing.

5475. American Environmental History. 3. History of American attitudes and actions toward the land and natural resources. Dual listed with HIST 4475. *Prerequisite:* graduate standing.

5480. Growth of Modern America, 1929-1960. 3. A political and diplomatic overview of the United States in Depression, World War II and early Cold War periods. Some attention to cultural and social themes. Emphasis on economic crisis, growth of government, reform traditions, anti-communism, and civil rights. Dual listed with HIST 4480. *Prerequisite:* graduate standing.

5490. Modern America, 1960 to Present. 3. A political and diplomatic overview of the United States since 1960 with emphasis on impact of Cold War social and political tensions at home, civil rights, and government policies. Dual listed with HIST 4490. *Prerequisite:* graduate standing.

5492. Revolutions in Latin America. 3. Explores the meaning and impact of revolution in Latin America’s modern history, focusing on political ideology, cultural expression, foreign relations, human rights, and globalization. Offers in-depth analysis of revolutions from the early nineteenth century to the present. Dual listed with HIST 4492. *Prerequisite:* graduate standing.

5494. The U.S. in Latin America. 3. This course explores Latin America’s experiences with the United States during the twentieth century. The class addresses U.S.-Latin American relations from a variety of angles, covering topics from military intervention and government policies, to informal imperialism

and cultural exchanges through film and literature. Dual listed with HIST 4494. *Prerequisite:* graduate standing.

5495. Borderlands in Latin America. 3. Examines borderlands and frontiers in Latin American history, focusing on the U.S.-Mexico border region, the Southern Cone, and the Caribbean. Key issues include cultural contact zones, colonialism, military expansion and conflict, and nation-building. Dual listed with HIST 4495. *Prerequisite:* graduate standing.

5496. History of Mexico. 3. Intensive course in Mexican development. Emphasizes the 20th century especially the Mexican Revolution of 1910, showing how this nation transformed itself, into a modern nation state. Includes diplomatic relations with the U.S., incorporation of Indians, church-state relations, uses of land and other natural resources, role of the military and growth of Mexican nationalism. Dual listed with HIST 4496. *Prerequisite:* graduate standing.

5500. Readings in Women's Studies. 3. An interdisciplinary course at the graduate level focusing on feminist criticism and theory, which draws on current debates in feminist analysis from the general areas of history, literature, and social science, to inform students of reformulations of research and unresolved issues. Dual listed with WMST 5500. *Prerequisites:* graduate standing.

5505. The Old South, 1820-1861. 3. The history of the South from the emergence of southern identity to the Civil War, with emphasis on southern society and culture. Dual listed with HIST 4505. *Prerequisite:* graduate standing.

5510. Modern East Asia. 3. Focuses on the emergence of the modern East Asian states China, Japan, Korea and Vietnam as individual states and members of this important region historically and in contemporary era, understanding the emergence of those states as responses to internal forces and external pressures such as imperialism, nationalism, Communism and Capitalism. Dual listed with HIST 4510. *Prerequisite:* graduate standing.

5515. American Legal History. 3. An intensive study in the history of American law, the judicial system, the legal profession, and legal administration from colonial times to the present. Dual listed with HIST 4515. *Prerequisite:* graduate standing.

5530. 19th Century American West. 3. A study of the westward movement with emphasis on the trans-Mississippi West. Dual listed with HIST 4530. *Prerequisite:* graduate standing.

5535. History of Oil. 3. An intensive study in the history of oil development throughout the world. Emphasizes comparative studies of the industry as it developed in various parts

of the world and during various time periods, from pre-historic times to the present. The Wyoming oil/energy mineral history will be an important component of the course. Dual listed with HIST 4535. *Prerequisite:* graduate standing.

5540. 20th Century American West. 3. A study of the modern American West, with consideration of social, economic and political continuity and change. Dual listed with HIST 4540. *Prerequisites:* graduate standing.

5555. American Encounters. 3. Examines the centrality of cross-cultural interchange in American history by focusing on a series of critical encounters between American, European, African, and Asian people from the 16th century to the present. *Prerequisite:* graduate standing.

5560. American Social History in the 20th Century. 3. History of social mobility and conflict in the 20th century. Special emphasis on impact of industrialization, rapid urbanization, massive immigration, ethnic minorities, race, religion, women and the family, painting, and architecture. Dual listed with HIST 4560. *Prerequisite:* graduate standing.

5582. 20th Century U.S. Foreign Relations. 3. Studies Twentieth Century United States foreign relations with a focus on the Cold War period. Examines economic sources of policy decisions, elites and mass public opinion, as well as cultural, religious, ethnic racial and gender issues. Dual listed with HIST 4582; cross listed with INST 5582. *Prerequisite:* graduate standing.

5585. Conference on U.S. History. 1-3 (Max. 6). A reading and writing course designed to allow advanced students to investigate shifting ideas about important topics in 20th century American history. Primary focus varies from semester to semester, but will be designated in the class schedule. *Prerequisite:* graduate standing.

5600. Graduate Readings. 1-6 (Max. 12). Fulfills two purposes in our graduate program in history. It allows students to do independent directed reading in preparation for their graduate examination in history and provides students with a flexible alternative to their programs to meet and complete requirements. *Prerequisite:* graduate standing.

5605. Conference on Wyoming and the West. 1-4 (Max. 9). *Prerequisite:* graduate standing.

5620. Conference on Middle-Period and United States History. 1-4 (Max. 9). *Prerequisite:* graduate standing.

5630. Seminar on Western American History. 3. *Prerequisite:* graduate standing.

5645. Seminar on American Indian History. 3. Research seminar on American Indian history. The focus of the seminar may vary, but emphasis will usually be given to American Indians of the western United States in the nineteenth and twentieth centuries. *Prerequisite:* graduate standing.

5660. Conference on Early Modern Europe. 1-4 (Max. 9). The student, in consultation with the instructor, chooses a topic on which he/she reads extensively. The instructor provides bibliographical guidance. Normally the student discusses the reading at length with the instructor once a week. Written analysis of the reading may also be required. The course may be offered to a group of students who need extensive reading to go with the research experience they are receiving in seminars. *Prerequisite:* graduate standing.

5670. Seminar on Early American History. 3. *Prerequisite:* graduate standing.

5675. Seminar on Middle-Period U.S. History. 3. *Prerequisite:* graduate standing.

5685. Conference on European 19th and 20th Century History. 1-4. Available for a maximum of 9 hours. *Prerequisite:* graduate standing.

5810. Seminar on Latin American History. 1-4 (Max. 12). Students will select a topic of interest within the general field of Latin America and read the published works which deal with the subject. Instructor will direct this reading through the preparation of bibliography. Students then prepare an in-depth research paper based on primary source documents. Research paper will treat an aspect of the subject under investigation that has not been dealt with in published materials. *Prerequisite:* graduate standing.

5880. History Theory. 3. Intensive reading and writing course, designed to introduce graduate students to influential recent historical works, and to the faculty of the department and their research areas. Students will explore historical theories and the historiography of particular topics. *Prerequisite:* graduate standing.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Students are expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

5910. Seminar in History Profession. 3. This seminar introduces graduate students to the profession of history through targeted readings, projects, guest speakers, and workshops. Topics covered include: archival research and source analysis, schools of thought and methodologies used by professional historians, career options in history, college teaching

and course design, grant applications, and professional networking. *Prerequisite:* graduate standing in history.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

American Studies

Cooper House, (307) 766-3898

Web site: www.uwyo.edu/ams

Director: Frieda E. Knobloch

Professor:

FRIEDA E. KNOBLOCH, B.A. Cornell University 1985; Ph.D. University of Minnesota 1994; Professor of American Studies 2014, 1997.

Associate Professors:

ULRICH ADELT, Magister Artium, University of Hamburg 2000; M.A. University of Iowa 2005; Ph.D. 2008; Associate Professor of American Studies 2015, 2009.

LILIA SOTO, B.A. University of California-San Diego 2000; M.A. University of California-Berkeley 2003; Ph.D. 2008; Associate Professor of American Studies and Latina/o Studies 2017, 2010.

Academic Professional Research Scientist

ANDREA GRAHAM, B.A. University of Pennsylvania 1978; M.A. 1980; Associate Academic Professional Research Scientist 2016, 2009.

Professors Emeriti:

John Dorst, Eric Sandeen

Adjunct Faculty:

(See Catalog section following name for academic credentials)

R. McGregor Cawley,
Political Science

Fred Chapman, public historic
preservation consultant

Catherine Connolly, Gender
and Women's Studies

Colleen Denney, Art

Anthony Denzer, Architectural
Engineering

Michael Harkin, Anthropology

Tammy Heise, Religious Studies

Isa Helfgott, History

Scott Henkel, English and Wyoming
Institute for Humanities Research

Jeanne Holland, English

Mary Humstone, public historic
preservation consultant

Michelle Jarman, Wyoming

Institute for Disabilities

Mary Keller, Religious Studies

Rachel Sailor, Art

American Studies explores American cultural experience past and present, through a wide range of approaches to American lives, places, arts, knowledges, communities, institutions, histories, and ideas. American Studies is an integrative field that comes from and adds to the context of our cultural lives in the U.S. and the U.S. in the world. American Studies frames present concerns with engagement with the past; expects us to engage people's experiences in the context of a diversity of experiences; and invites us to understand our own commitments and interests as valuable contributors to American cultural understanding. American Studies as a field depends on and adds to insights of scholars, artists, and scientists from virtually any field of expertise.

The American Studies program offers undergraduate B.A. and graduate M.A. degrees in American Studies, as well as courses of general interest to students in any degree.

Our program places special emphasis on studying American cultures through field experiences and internships: students apply academic knowledge and develop professional skills in community and non-profit organizations, historic preservation efforts and organizations, historic sites, museums and collections, among many possibilities. Every internship is developed in close consultation between the students and our Internship Coordinator, and frequently stems from a student's general idea about where or with whom they'd like to work, in Laramie or Wyoming, in other parts of the U.S., or sometimes abroad. Our program also highlights international perspectives, as well as the transnational context of American impacts and experiences, in course work and exchanges available to American Studies students.

American Studies puts people and their plans together building career goals in K-12 education, law, or business, work in community organizations and public institutions, or further graduate-level study.

Undergraduate Major

The American Studies B.A. frames and develops each student's individual interests, and allows students to include courses from any program and department that sustain a student's engagement with their particular emphasis. Individual programs of study are as varied as our students.

We value each student as a person, and understand that an education is much more than a list of courses. Our advising is central in supporting each student's path and success through the major and beyond the degree.

Examples of concentrations that draw on courses outside American Studies - interests which we then integrate in our independent studies, internships, and the senior seminar - include sports studies, popular music history, comparative ethnic studies, marketing, military history, sustainability, disability advocacy, museum studies, philosophy of science, environmental studies, public health and social justice, and the U.S. in international perspectives. Each student develops a concentration of study with their American Studies advisor with ample room to combine courses and interests into a coherent undergraduate education.

The American Studies B.A. can be an attractive second major for students in any UW degree program where cultural context enriches and expands work in their professional or scholarly field. The flexible nature of our B.A. allows us to work effectively with students changing majors at any point in their undergraduate experience as well as transfer students.

Program Learning Outcomes

Students graduating with a B.A. in American Studies integrate study from several fields with their study in American Studies courses, in individual programs of study. The American Studies B.A. prepares students to enter graduate and professional programs, enter education certification programs, and work in community organizations and other public professional settings. Coursework in American Studies prepares students to:

- Interpret American cultural experiences and creative expressions by applying appropriate approaches to interpreting words, narratives, images, material objects, communities, built environments, cross-cultural comparison, continuities and discontinuities with the past in a range of American cultural settings.

- Understand the processes of diversity in American experience including their own, through study of identity formation, performance of identity, stereotyping, cultural contact, cultural memory, and national identity.
- Demonstrate critical analysis, interpretation, or insight, through effective communication primarily in writing, but also in speaking (when appropriate, performance or display may embody these qualities as well), as demonstrated in analytically coherent interpretive writing, authoritative, informed oral presentation, and well-documented, visually effective performance or display (where appropriate).
- Apply American Studies methods in field-based courses and/or internships, through use of American Studies approaches and competencies in non-classroom settings, as demonstrated in field course or internship evaluations and students' final reports.

Because American Studies is both an international field with scholars all over the world, and the U.S. has transnational significance, **we strongly encourage students to take 2 years of language study** to achieve meaningful access to skills as readers, scholars, and travelers, and consider participating in an international exchange. Some languages currently in demand by American Studies students include Spanish, Arabic, and Japanese.

Through the following curriculum, students develop individual programs of study, with their advisers, to understand and engage American cultures.

1. Foundation (12 credits):

- AMST 2010
- Two courses at the 1000- or 2000-level in interdisciplinary fields, optionally including one in American History, from programs and departments such as African and American Diaspora Studies, American Indian Studies, Environment and Natural Resources, International Studies, Gender and Women's Studies, Latina/o Studies, Religious Studies, or appropriate courses transferred from other institutions, to be named in the program of study in consultation with an American Studies advisor.

- Two courses at any level from programs in The School of Culture, Gender, and Social Justice or appropriate substitutes in consultation with an American Studies advisor.

2. Concentration (27 credits)

Core. Each student must take three AMST courses at the 3000-4000 level, excluding the senior seminar. These seminars are designed to maintain an interdisciplinary view of American culture and to foster an American Studies community (9 credits).

Theme. An American Studies theme is devised, in consultation with the student's adviser, and is presented to the American Studies core faculty in writing as a proposed course of study. This proposal is usually made at the end of the second year of study (or upon completion of 60 hours of course work toward graduation), since the document guides the student through an exploration of American culture. Typical themes include: American diversity, environment and society, material culture and everyday life, visual culture and media, American cultural history, American institutions and public culture, the United States in international perspective. The theme must include a minimum of 6 credits and a maximum of 9 credits in a single discipline. Up to 3 credits can be granted for courses at the 1000-2000 level (18 credits).

3. Capstone (6 credits):

Senior seminar plus an individual project stemming from either AMST 4010 (independent study) or AMST 4970 (internship).

Students pursuing Program honors should also write an undergraduate thesis.

Internships

The internship experience is essential for students specializing in public sector American studies. The American Studies program has an active program of scholarship-supported internships that can place students in work environments in Wyoming, other parts of the U.S., or in selected foreign countries.

Exchanges

The program has established semester or academic year exchanges with universities in Great Britain, the Netherlands, Denmark and New Zealand in order to encourage an international understanding of American culture. The Elaine Kay Clatterbuck Fund supports majors who are spending this valuable time abroad.

Financial Aid

The William Robertson Coe Fellowship supports undergraduate tuition. The Long-Findeisen Fund supports individual research or exhibition projects. The Elaine K. Clatterbuck Fellowship assists students engaged in an international research or exchange. The internship program provides students with a stipend while engaged in a program-approved internship.

Teacher Education

Teacher certification in elementary or secondary (social studies) is available by arrangement with the College of Education. Students will be assigned an adviser from the College of Education, as well as from American Studies.

Certificate

The certificate program allows students to choose from undergraduate and graduate courses in American Studies, literature, geography, music, art, history, philosophy, sociology, folklore, anthropology, American Indian studies, political science, environmental studies, and media studies. The program encompasses two semesters of full time work: a total of at least 24 semester hours, or approximately 8 courses. Of these, 6 hours (2 courses) must be selected from the following list:

AMST 2010	3
and	
Any AMST course at the 4000- or 5000-level	3

An additional 18 hours (6 courses) are chosen in consultation with an American Studies faculty adviser. The final 3 credit hours, completed during the summer months, are devoted to an internship (AMST 4970) or field experience in American culture (AMST 4900).

Undergraduate Minor

Students may minor in American Studies through a program of 24 credit hours of study, with credit hours evenly distributed between lower and upper division courses, which include at least 3 courses in American Studies (with the AMST course prefix), at any level (except AMST 1101), in consultation with and depending on approval by a faculty advisor in American Studies. Coursework for the minor may be matched with a student's major requirements in related disciplines and fields.

Graduate Study

The American Studies M.A. is an interdisciplinary professional development degree in a committed learning community that builds on students' research interests, accomplishments, experiences, and career goals working with American cultural contexts past and present. After the M.A., our alums seek further professional specialization in law, education, writing, library and information science, and other fields; pursue Ph.D.s in academic careers in American Studies and other scholarly areas including ethnic studies, cultural geography, literature, religious studies, anthropology, history, ethnomusicology, among others; and work professionally in public settings, including historic preservation organizations, historic sites, museums, collections, and other non-profit, community or governmental organizations.

The M.A. is a 2-year program for students enrolled full-time, culminating in a major research project, either a "Plan A" thesis, or a "Plan B" non-thesis portfolio of work. We work frequently with part-time M.A. students to accommodate other demands on students' time. We encourage the development of emergent, innovative formats and project types as valuable contributions to contemporary American studies practice, relevant to a student's professional development plans.

Because American Studies is an international field with scholars all over the world, and the U.S. has significant impacts transnationally, M.A. Students from outside the U.S. are a regular part of our M.A. cohort, and we encourage our M.A. students to consider semester exchanges abroad. The Program also supports American Studies M.A. student and faculty participation in the annual biennial international conferences. Every two years, we welcome the winner of the British Association of American Studies' Peter Boyle Award into the M.A. cohort.

All M.A. students complete at least 15 credit hours in American Studies courses: 2 required theory and methods courses in the Program (AMST 5500 and AMST 5510), and 3 graduate seminars in American Studies. The remainder of coursework - 12 credits for those completing a thesis, or 15 credits for those completing non-thesis portfolios - can be drawn from graduate-level coursework in any area of study. Most of our M.A. students complete 1-3 credit internships as part of their

coursework, in public or organizational sites in Laramie, elsewhere in Wyoming or the U.S., and occasionally abroad as well. M.A. students' paths through their programs of study are as varied as our students.

Applicants to the M.A. program do not have to have prior majors in American Studies. The American Studies program does not require the GRE in applications to our M.A. program.

Financial Aid

The American Studies M.A. is generously supported by endowment funds that allow us to award significant financial aid to M.A. students enrolled full time, through teaching, research, or community organization assistantship placements, as well as scholarship support as appropriate for students' own M.A. research.

Program Specific Admission Requirements

A significant writing sample (usually a seminar paper or, for those coming from technical fields, a major report) that demonstrates potential for graduate study.

Program Learning Outcomes

Students graduating with an M.A. in American Studies integrate their educational backgrounds, research and professional interests, and coursework at the M.A. level inside and outside American Studies, in individual programs of study, to professionally engage American cultural production and communities in preparation for professional work or advanced graduate study. Students earning the M.A. in American Studies, either completing a thesis or pursuing the non-thesis Plan B project, are prepared to:

- Interpret a variety of objects significant to the study of American cultures, including words, narratives, images, material objects, communities, built environments, identities, cross-cultural and/or international perspectives, continuities and discontinuities with the past in a range of cultural settings.
- Demonstrate professional competence in writing and speaking in error-free expository prose, authoritative oral presentation, insightful use of relevant source material reflecting critical reading skill, prose style commensurate with professional responsibility, and prose content commensurate with professional responsibility.

- Produce professional research for a well-defined community (scholarly, public, or an appropriate combination), by identifying and using primary sources, building approaches from a relevant matrix of secondary sources, and understanding scholarly traditions within the field of American Studies that supports, expands, and connects research to professional goals.
- Make effective plans for advanced graduate study or professional employment by developing competencies listed above, including the opportunity to complete appropriate internship or field course work in an area of the student's professional plans.

Program Specific Degree Requirements

Degree requirements based on university minimum requirements. Successful completion of the following: AMST 5500 and AMST 5510 with a grade of B or better, 9 additional credit hours in American Studies graduate-level courses, 12 credit hours (Plan A thesis) or 15 credit hours (Plan B non-thesis) of graduate-level coursework in any field, and either a Thesis (Plan A) or a non-thesis project (Plan B).

American Studies (AMST)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◆Q]).

1030. Social Justice in the 21st Century.

3. [I,D◆(none)] Appropriate for students interested in diversity and social justice. Topics covered through an interdisciplinary study of people and society range from identity, critical thinking, empowerment, role models, stereotyping, institutional discrimination, and tolerance. The key lynchpin is active participation in the development and maintenance of just communities. Cross listed with AAST/NAIS/WMST/LTST 1030. Enrollment preference will be given to We The People FIG students.

1101. First-Year Seminar. 3. [(none)◆FYS]

2010. Introduction to American Studies. 3. [CH,WB◆H] Introduces the interdisciplinary study of American culture. Focuses on themes, values and ideas which continue to reverberate through U.S. cultural experience. (Offered at least once each year)

2400. Introduction to Historic Preservation. 3. Online course introduces students to historic preservation theory and philosophy, the history of the preservation movement

and contemporary historic preservation as practiced in the public, nonprofit and private realms. Assignments include reading, research, online discussion and lectures (podcasts, videos or PowerPoint presentations), as well as directed field work.

2700. Introduction to Museology. 3. [CH◆(none)] Explores the historical, cultural, and contemporary roles of museums and preservation institutions in society. Introduces students to the museum professions, collection and exhibition installation strategies, and ethical problems of governance and collection. Field trips to regional collections are included. Cross listed with ART/ANTH/HIST 2700.

3050. Cultures of Nature in the United States. 3. Uses artistic, philosophical, historical and literary material to investigate how ideas about and representations of nature have changed over time in the U.S. Culminates in an examination of a wide range of contemporary environmental ideas within this broad historical and cultural context. Cross listed with ENR/WMST 3050. *Prerequisite:* 2000-level course in one of the following departments: AMST, American history, American literature, or a 2000-level course approved for the ENR program, or instructor approval.

3100. Food in American Culture. 3. [C◆(none)] An interdisciplinary exploration of food as a medium of cultural expression, social interaction, and aesthetic experience in American life, both past and present. Examines food as, among other things, a symbolic system, a vehicle of social communication, and an arena for the performance of regional ethnic, gender, etc. identities. *Prerequisite:* any 2000-level course in American Studies, or ANTH 1200, or instructor approval.

3800. Chicanas/os in Contemporary Society. 3. [CS,D◆(none)] Focuses on three major movements within the Chicana/o community; labor, nationalism, and feminism. Students will assess these three movements to determine what role they have played in transforming the social conditions and political identity of the Chicana/o and Latina/o population in the US. Cross listed with LTST/WMST 3800. *Prerequisites:* LTST 1100 or WMST 1080 or AMST 2010.

3400. Popular Music and Sexualities. 3. [CH,D◆(none)] Looks at ways in which popular music has intersected with sexual and gendered identities as a means and expression of both oppression and liberation. Cross listed with WMST 3400. *Prerequisite:* WA.

4010. Independent Study. 1-3 (Max. 6). For upper division students in any major who can benefit from independent study in Ameri-

can Studies with minimal supervision. Dual listed with AMST 5010. *Prerequisites:* 3 hours in American Studies and approval of instructor.

4020. American Folklife. 3. Introduces materials and methods of folklife research, examining both verbal and nonverbal expressions of traditional cultures in America. Topics include material culture, belief systems, traditional events and celebrations, and folk performances of many kinds. Dual listed with AMST 5020. *Prerequisite:* Any six hours from among AMST 2010, ENGL 2400, NAIS 2340, AAST 2450, 2730, 3000, 3010. (Offered once each year)

4030. Ecology of Knowledge. 3. Examines the development of “disciplines” and explores definitions, theories, methods and practices of interdisciplinary work. Cross listed with ENR 4030. Dual listed with AMST 5030. *Prerequisite:* 3 hours in any interdisciplinary program.

4040. Historic Preservation and Sustainability. 3. Explores the historic preservation and sustainability movements and contemporary practices in these inter-related fields. Through reading, lectures, discussions and site visits, students will study how the historic preservation and the building industry professions can address advanced issues in sustainability related to the environment, culture and economics. Cross listed with ARE 4040. *Prerequisites:* 6 hours in AMST or ARE.

4051. Environmental Politics. 3. Analyzes environmentalism as a political phenomenon. Provides a basic understanding of how to analyze political issues by: (1) examining the historical and contemporary issues that produce controversy over environmental matters; and (2) surveying the impacts of these issues on the formulation and implementation of laws, policies, and regulations. Cross listed with POLS/ENR/GEOG/REWM 4051. *Prerequisite:* POLS 1000.

4052. Federal Land Politics. 3. Examines the political forces that have shaped and continue to shape federal land policy and management. Explores the interactions between democratic decision making and science in the management of federal lands. Surveys the sources of controversy over federal land management and methods for harmonizing public demands with technical expertise. Cross listed with POLS/ENR/GEOG/REWM 4052. *Prerequisite:* POLS 1000.

4250. The Harlem Renaissance. 3. [D◆(none)] Examines the florescence of African American creativity, centered in Harlem, New York, between the end of World War I and the onset of the Great Depression. This movement had a tremendous impact on African American culture in and outside of

the U.S., including Africa and the Caribbean. Dual listed with AMST 5250; cross listed with AAST 4250. *Prerequisites:* AAST 1000, AMST 2010, any AAST 2000-level course, junior or senior standing, or nine credit hours in any level AMST course.

4300. American Culture and the Public Sector. 3. Surveys American culture studies in the public sector. Topics include history and theory of public sector humanities and social sciences; types of public sector jobs and institutions where public humanists work; and public sector work in specific disciplines, such as history, anthropology, folklore, archaeology and art history. Dual listed with AMST 5300. *Prerequisite:* 12 credits in humanities or social science courses having to do with American culture. (Offered once a year)

4430. Queer Theory. 3. [(none)◆H] Introduces students to the intellectual lens used to evaluate the messages regarding gender and sexuality of many institutions and the way in which some actual experiences fall out of line with those norms. Dual listed with AMST 5430; cross listed with WMST 4430. *Prerequisite:* Consent of instructor.

4500. American Civilization. 1-8 (Max. 8). Explores various interdisciplinary approaches to the American experience, past and present. May include topical, thematic, historical, literary and cultural integrations; for a given semester, the course’s precise focus will be indicated in the class schedule.

4640. Art and Ecology. 3. Focuses on the intersection of contemporary art with ecological concerns. Readings present philosophical, historical and cultural aspects of the art/ecology relationship; students reflect and question their own beliefs. Examples of art/artists are reviewed as well as how ecological artwork is developed. Students propose solutions and/or create art in, out of, or about the environment; local sites are encouraged. *Prerequisite:* 6 hours of ART and/or AMST or consent of the instructor.

4650. Women, Gender & Migration. 3. From an international context and perspective, this course examines the gendered transformations immigrant women experience. Gender, theories of international migration, assimilation, race, ethnicity, and identity transformation serve as categories of analysis. From a cross-discipline comparative approach, we focus on women’s lives to examine differences and similarities to complicate notions of immigration. Cross listed with LTST/INST/WMST 4650. Dual listed with AMST 5650.

Prerequisites: Junior standing and 6 hours of AMST, LTST, INST, and/or WMST coursework or instructor approval.

4800. Historic Preservation. 3. Review of the roots of historic preservation in Western culture with an emphasis on the historical and legal context of architectural conservation in America. Current issues in preservation are examined through case studies and guest presentations. Cross listed with ENR 4800. Dual listed with AMST 5800. *Prerequisite:* ARE 3020 or AMST 5400.

4900. Field Studies in Historic Preservation. 1-4 (Max. 4). Acquaints students with current issues in historic preservation by visiting places of importance in U.S. and Europe. Agencies and institutions involved in building conservation provide specific expertise at sites visited. *Prerequisite:* 3 hours of architectural history or 6 hours of art history. (Offered based on sufficient demand and resources)

4970. Internship. 1-3 (Max. 6). Gives undergraduate students practical experience by working on a project at a public institution, agency or educational/cultural organization. Offered for S/U only. *Prerequisites:* junior standing, completion of AMST 2010 and 12 hours in major and consent of instructor.

4985. Senior Seminar. 3. [WC♦(C3)] With AMST 4010 or 4970, completes the capstone coursework in AMST. Identifies a broad intellectual tradition in American Studies as foundation for student's research interests; builds a specific scholarly context appropriate to student's research; culminates in a substantial piece of written research appropriate in an identified subfield of American Studies. *Prerequisite:* senior standing in American studies or consent of program director.

5010. Independent Study. 1-6 (Max. 6). For graduate students in any graduate program who can benefit from independent research and writing in American Studies. Dual listed with AMST 4010. *Prerequisites:* 3 hours in American Studies and consent of instructor.

5020. American Folklife. 3. Introduces materials and methods of folklife research, examining both verbal and nonverbal expressions of traditional cultures in America. Topics include material culture, belief systems, traditional events and celebrations, and folk performances of many kinds. Dual listed with AMST 4020. *Prerequisites:* any six hours from among: AMST 2010, ENGL 2400, NAIS 2340, AAST 2450, 2730, 3000 or 3010.

5030. Ecology of Knowledge. 3. Examines the development of "disciplines" and explores definitions, theories, methods and practices of

interdisciplinary work. Cross listed with ENR 5030. Dual listed with AMST 4030. *Prerequisite:* graduate status.

5200. Material Culture. 3. Designed to introduce advanced students to the theory, methods, and practice of material culture study. A significant portion of the course will be devoted to a studio exercise in which students collectively document and analyze a material culture form that has been designated by the instructors. *Prerequisite:* graduate status or consent of instructor.

5250. The Harlem Renaissance. 3. Examines the florescence of African American creativity, centered in Harlem, New York, between the end of World War I and the onset of the Great Depression. This movement had a tremendous impact on African American culture in and outside of the U.S., including Africa and the Caribbean. Dual listed with AMST 4250; cross listed with AAST 5200. *Prerequisites:* AAST 1000, AMST 2010, any AAST 2000-level course, junior or senior standing, or nine credit hours in any level AMST course.

5300. American Culture and the Public Sector. 3. A survey of American culture studies in the public sector. Topics covered include the history and theory of public sector humanities and social sciences, types of public sector jobs and institutions where public humanists work, and public sector work in specific disciplines such as history, anthropology, folklore, archaeology, and art history. Dual listed with AMST 4300. *Prerequisite:* graduate status.

5400. American Built Environment. 3. Examination of America's built environment from pre-Colonial times to the present day. Factors affecting the architecture and built form of a given period are discussed together with what the material legacy says about the culture of the period. *Prerequisite:* ARE 3020.

5430. Queer Theory. 3. Introduces students to the intellectual lens used to evaluate the messages regarding gender and sexuality of many institutions and the way in which some actual experiences fall out of line with those norms. Dual listed with AMST 4430; cross listed with WMST 5430. *Prerequisite:* Consent of instructor.

5500. Topics in American Studies. 3. Selected problems in the theory, practice, and bibliography of American studies. Required of graduate majors in the program and is recommended for students with an interdisciplinary interest in American Culture. *Prerequisites:* survey knowledge of American literature and history; graduate standing or consent of instructor.

5510. Readings in American Studies. 3. Selected readings in the theory, practice, and bibliography of American Studies. Surveys scholarship in the field and is designed to help graduate students develop thesis topics.

Prerequisites: graduate standing in American studies or related field; consent of instructor.

5550. Varieties of Literary Evidence. 3. Selected problems in the use of literary evidence for American studies scholarship. *Prerequisites:* graduate standing in American studies or a related field; consent of instructor.

5560. Black Popular Culture. 3. Approaches African American popular culture from theoretical perspectives which include black feminist, postcolonial, and poststructuralist analyses. Cross listed with AAST 5560. *Prerequisites:* graduate standing; instructor consent for undergraduate students.

5650. Women, Gender & Migration. 3. From an international context and perspective, this course examines the gendered transformations immigrant women experience. Gender, theories of international migration, assimilation, race, ethnicity, and identity transformation serve as categories of analysis. From a cross-discipline comparative approach, we focus on women's lives to examine differences and similarities to complicate notions of immigration. Cross listed with LTST/INST/WMST 5650. Dual listed with AMST 4650. *Prerequisites:* Junior standing and 6 hours of AMST, LTST, INST, and/or WMST coursework or instructor approval.

5800. Historic Preservation. 3. Review of the roots of historic preservation in Western culture with an emphasis on the historical and legal context of architectural conservation in America. Current issues in preservation are examined through case studies and guest presentations. Cross listed with ENR 5800. Dual listed with AMST 4800. *Prerequisite:* ARE 3020 or AMST 5400.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: Credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrolled in a graduate degree program.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

Languages – Modern and Classical

116 Hoyt Hall, (307) 766-4177

FAX: (307) 766-2727

Website: www.uwyo.edu/modlang

Department Chair: Joy Landeira

Professor:

CONXITA DOMÈNECH, B.A. Universitat Autònoma de Barcelona 1990; Licenciatura 1992; M.A. University of Colorado Boulder 2006; Ph.D. 2010; Professor of Spanish 2020.

JOY LANDEIRA, B.A. University of Wyoming 1973; M.A. 1975; Ph.D. University of Colorado, Boulder 1981. Professor of Spanish 2015. Department Chair.

Associate Professors:

EKATERINA ALEXANDROVA, B.A. Saint Joseph's University 2003; M.A. Dartmouth College 2004; Ph.D. University of Pennsylvania 2012; Associate Professor of French 2018, 2012.

IRENE CHECA-GARCÍA, B.A. University of Granada 1997; M.A. Linguistics University of Granada 2000; Ph.D. Universidad de Almería 2004; Associate Professor of Spanish 2018, 2012.

REBECCA E. STEELE, B.A. Leibniz-Academie 2001; M.A. Rutgers, The State University of New Jersey 2008; Ph.D. 2009; Associate Professor of German 2015, 2009.

KHAMA-BASSILI TOLO, G3: Gradué en Pédagogie Appliquée, Option: Français-Linguistique Africaine, Université Nationale du Zaïre 1976; L2: Licencié en Pédagogie Appliquée, Option: Français, 1978; M.A. Vanderbilt University 1986; Ph.D. 1989; Associate Professor of French 1996, 1990.

Assistant Professors:

CHELSEA ESCALANTE, B.A. Stanford University 2005; M.A. University of Arizona 2009; Ph.D. University of California, Davis 2018; Assistant Professor of Spanish 2018.

SONIA RODRIGUEZ HICKS, Ph.D. University of New Mexico 2017. Assistant Professor of Spanish 2020.

Senior Academic Professional Lecturers:

LAURA DE LOZIER, B.A. Beloit College 1990; M.A. University of Wisconsin 1992; Ph.D. 2002; Senior Academic Professional Lecturer in Classics, Greek, and Latin 2014, 2003.

MARK W. PERSON, B.A. University of Wyoming 1983; M.A. 1986; Senior Academic Professional Lecturer in German 2017, 2008.

BÉNÉDICTE SOHIER, B.A. Stephen F. Austin State University 2006; M.A. Indiana University Bloomington 2008; **BÉNÉDICTE SOHIER**, B.A. Stephen F. Austin State University 2006; M.A. Indiana University Bloomington 2008; Associate Academic Professional Lecturer in French 2015, 2009.

YAN ZHANG, B.A. Harbin Institute of Technology 2000; M.A. Heilongjiang Provincial Academy of Social Sciences 2002; Senior Academic Professional Lecturer in Chinese 2016, 2006.

Associate Academic Professionals

Temporary Lecturers:

Xuan-Xabier Huynh, Noah Miles

Professors Emeriti:

M. Ian Adams, Lewis Bagby, Lowell A. Bangerter, Klaus D. Hanson, Francis S. Heck, Philip G. Holt, Joseph Krafczik, Walter G. Langlois, Hannelore Mundt, Jean-Louis G. Picherit, Duane Rhoades, Pavel Sigalov

The Modern and Classical Languages department offers work leading to the B.A. degree with majors and minors in French, German, and Spanish. A minor is offered in Classical Civilizations, Chinese, Latin and Japanese. The M.A. is available in Spanish. Courses are also offered in literature, linguistics and translation.

Foreign Language Requirements

All candidates for the B.A. and B.S. degree in the College of Arts and Sciences who matriculated before Fall 2015 are required to complete the equivalent of 8 semester hours of work in a single modern or classical language. Students with prior exposure to the language may be granted college credit after taking an online examination administered by the department; students must take this examination before completing registration for a language course (for regulations governing credit by examination, refer to Credit Available to Undergraduate Students in this *Catalog*). An advanced placement, AP, examination in the language with a score of 4 or higher satisfies

the language requirement in most languages, as do CLEP and IB scores (see section on Credit by Examination on the department website).

Students who have had a foreign language in high school should take the online examination to determine the course in which they should enroll and to avail themselves of the opportunity to receive credit by examination. Students who have completed their language requirement can enroll for additional language courses of their choice, something strongly advised for those who wish to reach adequate levels of proficiency in the language or wish to study abroad. Check the Catalog or website for special sections targeted for students with varied experiences in the language.

Undergraduate Major

A language major usually requires 30-31 semester hours of work in a single language beyond 2030. To include a language option in the humanities/fine arts interdisciplinary program, students must complete at least 12 hours above the 2030 level.

Students completing an undergraduate major in our department will meet the following learning goals:

1. attain proficiency in another language in all four of the basic skills (speaking, listening, reading, and writing);
2. gain understanding of other cultures; and
3. develop skills in research critical thinking, analysis, and writing on subjects appropriate to the field of study.

Students will meet the following learning outcomes to:

1. demonstrate proficiency in conversation;
2. demonstrate reading comprehension of texts written in the language;
3. produce grammatical, idiomatic compositions in the target language;
4. gain essential knowledge about the history, traditions, customs, and ways of thinking of at least one other culture;
5. demonstrate understanding of works of literature read in the original language; and
6. produce well-reasoned and clearly articulate research papers on subjects appropriate to their field.

French

Required courses for the major in French are 2040, 2140, 3005, 3050, 3060, plus 15 hours of electives at the 3000 or 4000 level.

German

Required courses for the major in German are 2040, 3050, 3060 plus 21 hours of electives in German above 2030.

Spanish

Spanish offers two major tracks:

- (1) The culture, literature, and cinema track requires 2040, 2140, 3030 or 3050, 3100 or 3110 or 3120, 3140 3300, plus an additional 12 hours of electives above SPAN 2030.
- (2) The language-linguistics track requires 2040, 3030/3050, 3060, 3140, 3300, 4080 or 4090, plus an additional 12 hours of electives above SPAN 2030.

Highly recommended electives for the language-linguistics track are SPAN 3040, 3080, 4070, 4080, 4090. It is possible to take one class from the following: SPPA 3160; ANTH 4775; ANTH 4785; ANTH 4795.

Minor

In general, students desiring to complete a minor in a foreign language will be required to complete a program of 18 semester hours above 2030. The requirements for individual languages are as follows:

Chinese

CHIN 2040	4
CHIN 2041	3
CHIN 3050	3
CHIN 3065	3
CHIN 3055	3
CHIN 4070 or CHIN 3160	3
Total	19

Note: Study abroad is required for completion of 12 credit hours of coursework for this minor.

Classical Civilizations

CLAS 2020 or HIST 2120	3
CLAS 2040 or HIST 2130	3
Electives	12

12 hours chosen from Classics 3000-level or above. Up to 6 hours of Latin at the 3000-level or above may be counted as

electives. Other courses about ancient Mediterranean cultures that are not taught under Classics may be submitted for approval as electives to the advisor for the minor.

Total **18**

French

FREN 2040	3
FREN 2140	3
FREN 3050	3
Electives	9

9 hours chosen from French at the 3000 or 4000 level.

Total **18**

German

GERM 2040	3
GERM 3050	3
GERM 3060	3
Electives	9

9 hours chosen from German at the 3000 or 4000 level.

Total **18**

Japanese

JAPN 2040	4
JAPN 3050	3
Electives	12

Electives to be chosen from: LANG 2150; LANG 3105; LANG 3140; HP 2151/4151; HIST 2460; HIST 2461; JAPN 3060; JAPN 4070; JAPN 4080; JAPN 4990.

Total **19**

Latin

LATN 3110	3
LATN 3140	2
LATN 4120	3
LATN 4130	3
Electives	7

Electives chosen from Latin at the 3000-level or above.

Total **18**

Spanish

Electives	18
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18 hours of electives in Spanish at the 2000-level or above (excluding SPAN 2030).

Total **18**

Teaching Certification

For those wishing to pursue teaching certification, contact the Department of Secondary Education.

Native Language Credit

Students are not allowed university credit for language courses in their native language below the 4000 level, but may receive credit for literature courses below that level.

Study Abroad

There are many opportunities for students to study abroad and students are encouraged to do so.

Suggested Curriculum for B.A. in a Foreign Language

(for students with no prior background in the language)

FRESHMAN YEAR: Fall	Hrs.
Language 1010	4
FRESHMAN YEAR: Spring	Hrs.
Language 1020	4
SOPHOMORE YEAR: Fall	Hrs.
Language 2030	4
SOPHOMORE YEAR: Spring	Hrs.
Language 2040	3 or 4
Language 2140	3
JUNIOR YEAR: Fall	Hrs.
Language 3050	3
Language 3000-4000-level	3
JUNIOR YEAR: Spring	Hrs.
Language 3060	3
Language 3000-4000-level	3
SENIOR YEAR: Fall	Hrs.
Language 4200	3
Language 3000-4000-level	3
SENIOR YEAR: Spring	Hrs.
Language 4000-5000-level	6

Graduate Study

The Department of Modern and Classical Languages offers programs leading to the master of arts degree in Spanish. Contact the department for further details or check the department website.

Program Specific Admission Requirements

Admission to the graduate program in a specific language is open to students who have completed an undergraduate major, or the equivalent, in the same subject and who meet the minimum requirements set forth in this *Catalog*.

Students entering the graduate program from other institutions may be required to make up deficiencies in areas covered by required courses in this department's undergraduate programs.

Program Specific Degree Requirements

Degree requirements are based on the university minimum requirements.

Chinese (CHIN)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1010. First Year Chinese I. 4. [(none)◀▶H] Fundamentals of grammar, conversation, and reading. Introduction to Chinese culture through the language.

1020. First Year Chinese II. 4. [(none)◀▶H] Fundamentals of grammar, conversation, and reading. Introduction to Chinese culture through the language. *Prerequisite:* CHIN 1010 or equivalent.

1101. First-Year Seminar. 3. [(none)◀▶FYS]
2030. Second Year Chinese I. 4. Grammar, composition, conversation and more vocabulary in Chinese. *Prerequisite:* CHIN 1020 or equivalent.

2040. Second Year Chinese II. 4. Further studies in grammar composition, conversation and more vocabulary in Chinese. *Prerequisite:* CHIN 2030 or equivalent.

2041. Contemporary and Traditional Chinese Culture. 3. Designed to provide those with a serious interest in China and Chinese language with a cultural context for learning Chinese language. Incorporates economic and social material to give students a clear view of Chinese culture with an emphasis on Chinese language instruction. *Prerequisite:* CHIN 2030.

3050. Intermediate Composition and Conversation. 3. Develop abilities to read and write complex Chinese texts with an intermediate level of understanding, including texts in both conversational and narrative styles. Reading and writing skills will build considerably on the skills learned in two years of university study in Chinese language. *Prerequisite:* CHIN 2040 or equivalent.

3055. Business Chinese. 3. [G◀▶COM2] Comprehensive course on business language skills. For students with proficiency in Mandarin at the Intermediate Mid level or higher. Focus is on language functions for the workplace. Productive skills, both spoken and written, will include the composition of extended frequently-used business documents. *Prerequisite:* CHIN 3050 or equivalent.

3065. Intermediate Composition and Conversation II. 3. Students will not only understand and construct complex speech and writing but will gain the ability to do so

effectively to persuade, discuss and communicate accurately with native Chinese speakers. Students will be able to relate topics such as personal experience, daily routine, reports, opinions and judgment in well-written Chinese paragraphs. *Prerequisite:* CHIN 3050 or equivalent.

3160. See Movies, Touch China. 3. [(none)◀▶H] This course combines exploration of classical and contemporary Chinese cultures through prominent Chinese films. The audio-video materials selected will be discussed in their historical context. Students will explore the transformations China has undergone, and will seek to understand the Chinese mindset. *Prerequisite:* COM1.

4070. Business Chinese II. 3. Apply previously acquired skills in complex Chinese language and business topics to the thorough analysis of case studies in Chinese business scenarios. Students will be able to read, discuss, and reach conclusions based on case studies of international companies in China and Chinese companies in international markets. *Prerequisite:* CHIN 3055.

Classics (CLAS)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

2020. Classical Greek Civilization. 3. [WB,C◀▶H] Examines some of the most important developments of ancient Greek culture. Includes development of government in the city-states, with particular attention to Athenian democracy; tragedies of Aeschylus, Sophocles and Euripides; comedies of Aristophanes; crisis of values of the Peloponnesian War; and philosophy of Plato. *Prerequisite:* WA or COM1.

2040. Classical Roman Civilization. 3. [WB,CH◀▶(none)] Examines some of the most interesting political, legal, artistic, literary, and engineering developments of the Republic and Principate (510 BC-AD 212). These include representational government, citizens' rights, sanctioned violence, Rome's infrastructure, and major literary works of oratory, comedy, history, epic, and philosophy. *Prerequisite:* WA or COM1.

3050. Athenian Democracy. 3. Examines democratic government in ancient Athens: its origins and development, its practical workings, how politics were conducted and power was gained and exercised, citizen participation, law courts, and evaluations of democracy in the ancient world and since. Cross listed with HIST/POLS 3050. *Prerequisite:* WB or COM2.

3160. "What Killed Socrates?" 3. This course will reexamine Socrates' trial in 399 BCE, widely regarded as a miscarriage of justice, in its total historic context, seeking to understand the reasons for Socrates' conviction. In the process, it will impart a broad understanding of the cultural, philosophical, political, and legal life of classical Athens. Cross listed with HIST/PHIL 3160. *Prerequisite:* WB or COM2.

4230. Greek Tragedy. 3. Reading and discussion of major plays by Aeschylus, Sophocles, and Euripides, together with examination of the performance and social context of Greek drama, its use of traditional myths, and selected issues in contemporary scholarship on the tragedies. Cross listed with ENGL/THEA 4230. *Prerequisite:* WB or COM2.

4270. Classical Epic Poetry. 3. Reading and discussion of major works of Greek and Latin epic poetry, centered on Homer and Vergil. Also includes consideration of the background of these works (both mythological and historical) and the development of the epic tradition in the ancient world. Cross listed with ENGL 4270. *Prerequisite:* WB or COM2.

4975. Independent Study. 1-4 (max. 12) Specialized study in aspects of Greek or Roman civilization of interest to the student, with topic and plan of work to be worked out by the student and the instructor together. *Prerequisite:* 6 hours of Classics courses or consent of instructor. (Offered based on sufficient demand and resources)

4990. Topics in Classical Civilization. 1-4 (max. 12) Study in depth of special areas in ancient civilization that are not covered in regularly offered courses. *Prerequisite:* 6 hours of Classics courses or consent of the instructor. (Offered based on sufficient demand and resources)

French (FREN)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1010. First Year French I. 4. [(none)◀▶H] Fundamentals of grammar, composition, conversation and reading.

1020. First Year French II. 4. [(none)◀▶H] Fundamentals of grammar, composition, conversation and reading. *Prerequisite:* FREN 1010 or two years of high school French.

2030. Second Year French I. 4. [(none)◀H] Emphasizes the development of communication skills (listening, speaking, reading and writing) so as to help students function effectively in real-life contexts. Provides a systematic review of grammatical structures necessary for successfully communicating in French. *Prerequisite:* FREN 1020 or three years of high school French.

2040. Second Year French II. 3. [(none)◀H] A course stressing the usage of the language through composition, conversation, oral presentations and grammar review. *Prerequisite:* FREN 2030, three years of high school French or FREN 1010, 1020 with grade of B or better.

2130. Contemporary French Culture. 3. [(none)◀H] Designed as an introduction to contemporary French culture. It gives students an in-depth insight into contemporary French life. It also deals with issues affecting the French-speaking world in general: Quebec, Africa, New Caledonia, Switzerland, Monaco, etc. *Prerequisite:* FREN 1020 or equivalent.

2140. Introduction to Reading. 3. [CH,G◀(none)] Introduction to the literature of France; analysis of major literary types and elements of criticism. *Prerequisite:* FREN 2030.

3005. French Phonetics and Pronunciation. 3. Focus on the phonetic structures of French through systematic pronunciation drills and phonetic transcriptions. Varied oral activities and exercises will help develop an awareness of spoken French and improve students' pronunciation. *Prerequisite:* FREN 2040 or equivalent.

3050. Third Year French I. 3. [WB◀COM2] A course stressing the usage of the language through composition, conversation, oral presentations and grammar review. *Prerequisite:* FREN 2040.

3060. Third Year French II. 3. A course stressing the usage of the language through composition, conversation, oral presentations and grammar review. *Prerequisite:* FREN 3050.

3110. Contemporary French Civilization. 3. Emphasizes the institution and values of contemporary France. Deals with the major political, social, cultural and economic aspects of today's France. Will be taught in French. *Prerequisite:* FREN 3050.

3990. Independent Study. 1-4 (Max. 4). Books or periodicals of special interest to the student, selected in consultation with a member of the staff; independent reading and reports. *Prerequisite:* FREN 2030.

4080. Studies in the French Language. 3 (Max. 9). The topics explored under this general heading include: translation, history of

the French language, French of the media and conversation. Dual listed with FREN 5080. *Prerequisite:* FREN 3060.

4100. A Survey of French Literature I. 3. A study of French Literature and civilization from the Middle Ages through the 18th century. *Prerequisite:* FREN 2140 or equivalent.

4110. A Survey of French Literature II. 3. A study of French Literature and civilization from the 19th century to the present. *Prerequisite:* FREN 2140 or equivalent.

4120. Medieval French Literature. 3. A survey of medieval French literature: epic, courtly poetry, Arthurian romance, theatre and the poetry of Villon. Dual listed with FREN 5120. *Prerequisites:* FREN 3050; FREN 4100 and 4110 strongly recommended.

4140. 17th Century French Literature. 3. [WC◀(none)] A survey of representative works from the major literary genres from the formative period to classicism and its aftermath. Dual listed with FREN 5140. *Prerequisites:* FREN 3050; FREN 4100 and 4110 strongly recommended.

4200. Introduction to Research. 3. [(none)◀COM3] Senior seminar on a topic varying from year to year. *Prerequisites:* COM2 (FREN 3050), Survey I and II courses (FREN 4100 and 4110).

4250 [4150]. 19th Century French Literature. 3. Development of romanticism from Rousseau on with excerpts from Chateaubriand and romantic poets like Hugo and Vigny. The period of realism-naturalism focuses on novels of Flaubert and Zola, while the symbolist school of poetry is represented by Baudelaire, Verlaine and Rimbaud. Dual listed with FREN 5250. *Prerequisites:* FREN 3050; FREN 4100 and 4110 strongly recommended.

4260 [4160]. 20th Century French Literature. 3. The era since 1900 is divided into four parts: pre-World War I, between the wars, post-World War II and the New Wave. These periods are represented by authors including Valery, Proust, Malraux, Saint-Exupery, Camus, Sartre and others. Dual listed with FREN 5260. *Prerequisite:* FREN 3050; FREN 4100 and 4110 strongly recommended.

4350. Studies in French and Francophone Literatures. 3. An intensive study of a topic, period or author (pertaining to French or Francophone literature), to be selected according to interest and currency). Dual listed with FREN 5350. *Prerequisites:* FREN 3060; FREN 4100 and 4110 strongly recommended.

4990. Advanced Independent Study. 1-3 (Max. 6). Special projects designed to meet the needs of individual students, designed in consultation with instructor. *Prerequisites:* FREN 3050 and consent of instructor.

5080. Studies in French Language. 3. (Max 9). Topics explored include: French translation, history of the French language, French of the media, and conversation. *Prerequisite:* FREN 3060.

5120. Medieval French Literature. 3. A survey of medieval French literature: Epic, courtly poetry, Arthurian romance, theatre, and the poetry of Villon. Dual listed with FREN 4120. *Prerequisites:* FREN 3050; FREN 4100 and 4110 strongly recommended.

5140. 17th Century French Literature. 3. A survey of representative works from the major literary genres from the formative period to classicism and its aftermath. Dual listed with FREN 4140. *Prerequisites:* FREN 3050; FREN 4100 and 4110 strongly recommended.

5160. Graduate Readings. 1-5 (Max. 6). *Prerequisite:* undergraduate major or minor in the subject.

5170. Special Problems. 1-2 (Max. 6). *Prerequisite:* undergraduate major or minor in the subject.

5250. 19th Century French Literature. 3. Development of romanticism from Rousseau on with excerpts from Chateaubriand and romantic poets like Hugo and Vigny. The period of realism-naturalism will focus on novels each of Flaubert and Zola while the Symbolist School of poetry will be represented by Baudelaire, Verlaine and Rimbaud. Dual listed with FREN 4250. *Prerequisites:* FREN 2050; FREN 4100 and 4110 strongly recommended.

5260. 20th Century French Literature. 3. The era since 1900 is divided into 4 parts: Pre-World War I, between the wars, post-World War II and the New Wave. These periods are represented by such authors as Valery, Proust, Malraux, Saint-Exupery, Camus, Sartre and others. Dual listed with FREN 4260. *Prerequisites:* FREN 3050; FREN 4100 and 4110 strongly recommended.

5350. Studies in French and Francophone Literatures. 3. An intensive study of a topic, period or author (pertaining to French or Francophone literature, to be selected according to interest and currency). Dual listed with FREN 4350. *Prerequisites:* FREN 3060; FREN 4100 and 4110 strongly recommended.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1 - 3 (Max 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

German (GERM)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1010. First Year German I. 4. [(none)◀▶H] Explores fundamentals of grammar, composition, conversation and reading.

1020. First Year German II. 4. [(none)◀▶H] Examines fundamentals of grammar, composition, conversation and reading. *Prerequisite:* GERM 1010 or two years of high school German.

1101. First-Year Seminar. 3. [(none)◀▶FYS]
2030. Second Year German I. 4. [(none)◀▶H] Includes reading simple novels, short stories, and dramas; grammar review; and conversation. Eight required laboratory exercises. *Prerequisite:* GERM 1020 or three years of high school German.

2040. Second Year German II. 3. [(none)◀▶H] Encompasses formal grammar review; weekly composition; as well as drill of oral skill including pronunciation, oral reports and free conversation. *Prerequisite:* GERM 2030 or three years of high school German.

3006. 20th Century German Culture and Civilization. 3. [WC,CH◀▶(none)] Major political, ideological and cultural developments in Germany between 1871 and the present. An interdisciplinary approach (history, art history, film and literature) allows students to explore and assess a nation's culture and civilization as well as far-reaching events (WWI, WWII and the Holocaust) from various perspectives. *Prerequisite:* junior standing.

3050. Third Year German I. 3. [WB◀▶COM2] Encompasses formal grammar review; weekly composition; as well as drill of oral skill including pronunciation, oral reports and free conversation. *Prerequisite:* GERM 2040.

3060. Introduction to German Literature. 3. Introduces literature of Germany. Analyzes major literary types and elements of criticism. Emphasizes compositions and corrective practice, stylistic analysis of representative texts and group discussion on prepared topics. *Prerequisite:* GERM 3050.

3150. German History and Culture. 3. [CH,G◀▶(none)] Taught in English, this class engages students both theoretically and practically with German history and culture throughout the ages from the Middle Ages to today. Reading content is complemented with outings to culturally and historically significant sites in Germany as part of a summer study abroad program. *Prerequisite:* WA or equivalent.

3990. Independent Study. 1-4 (Max. 4). Focuses on books or periodicals of special interest to the student selected in consultation with a staff member; independent reading and reports. *Prerequisite:* GERM 2030.

4070. Fourth Year German. 3. Emphasizes weekly compositions and corrective practice, stylistic analysis of representative texts and group discussion on prepared topics. Dual listed with GERM 5070. *Prerequisite:* GERM 3060. (Offered every other year)

4080. German-English and English-German Translation. 3. [WB◀▶(none)] Encompasses written translation exercises based on contemporary and relevant texts in both English and German. Addresses specific translation problems arising in both English and German, when translating into the other language. *Prerequisites:* GERM 3050 and/or 3060. (Offered fall semester)

4100. A Survey of German Literature I. 3. Studies German literature and civilization from the Middle Ages to the 17th century. Dual listed with GERM 5100. *Prerequisite:* GERM 2140 or equivalent.

4110. A Survey of German Literature II. 3. Studies German literature and civilization from the 18th century to the end of the 20th century. Dual listed with GERM 5110. *Prerequisite:* GERM 2140 or equivalent.

4145. Weimar Classicism. 3. Introduces student to Weimar Classicism, one of the crucial periods in German literature and culture. Explores the foundation of the movement, its cultural and historical contexts, aesthetic and philosophical principles, and significant works during this period. Primary language for instruction for this course is German. Dual listed with GERM 5145. *Prerequisite:* GERM 2140 or equivalent.

4180. German Poetry. 3. Surveys poetry from the Middle Ages to the present. Emphasizes poetry after 1600. Treats formal elements and genre categories. Dual listed with GERM 5180. *Prerequisite:* GERM 2140.

4200. Introduction to Research. 1-3 (Max. 9). Senior seminar on a topic varying from year to year. Includes study of standard bibliographical guides. Minimum of 3 hours recommended for majors. *Prerequisite:* 12 hours of 4000-5000-level courses.

4240. German Literature of the Romantic Period. 3. Introduces the philosophical bases of German Romanticism and analyzes representative works of prose and poetry. Dual listed with GERM 5240. *Prerequisite:* GERM 2140 or equivalent.

4255. 19th Century German Novellas. 3. Studies a wide selection of significant German novellas from the period when this genre flourished in the German-speaking world, with a popularity unparalleled in the rest of Europe. Examines the form's origins, evolution, reception, and theory. Dual listed with GERM 5255. *Prerequisite:* GERM 2140 or equivalent.

4275. Contemporary Migration Literature. 3. Introduces students to a range of recent cultural production by artists identified with immigrant communities or communities of color. Topics examined include intersections of gender, race, nation, culture, and class; experiences of different minorities; question of national and transnational identity, self-representation, immigration, multiculturalism and integration debates. Course is taught in German. Dual listed with GERM 5275. *Prerequisite:* GERM 2140 or equivalent.

4285. 20th/21st Century German Film. 3. Introduces students to classical German films, and thereby enhances their skills to conduct research in the Humanities. Themes to be discussed: representation of authority, issues of race and gender, German culture and history, the Americanization of German culture, minorities in contemporary Germany. Dual listed with GERM 5285. *Prerequisite:* WB.

4990. Advanced Independent Study. 1-3 (Max. 6). Encompasses special projects designed to meet needs of individual students, designed in consultation with instructor. *Prerequisites:* GERM 2140 and consent of instructor.
5070. 4th Year German. 3. Emphasizes weekly compositions and corrective practice, stylistic analysis of representative texts, and group discussions on prepared topics. Dual listed with GERM 4070. *Prerequisite:* GERM 3060.

5100. A Survey of German Literature I. 3.

A study of German literature and civilization from the Middle Ages to the seventeenth century. Dual listed with GERM 4100. *Prerequisite:* GERM 2140 or equivalent.

5110. A Survey of German Literature II. 3.

A study of German literature and civilization from the eighteenth century to the end of the twentieth century. Dual listed with GERM 4110. *Prerequisite:* GERM 2140 or equivalent.

5145. Weimar Classicism. 3. Introduces students to Weimar Classicism, one of the crucial periods in German literature and culture. Explores the foundation of the movement, its cultural and historical contexts, aesthetic and philosophical principles, and significant works written by Goethe and Schiller during this period. Taught in German. Students are expected to read, write and discuss in German. Dual listed with GERM 4145. *Prerequisite:* graduate standing.

5160. Graduate Readings. 1-5 (Max. 6).

Prerequisite: undergraduate major or minor in the subject.

5180. German Poetry. 3. A survey of poetry from the Middle Ages to the present. Emphasis on poetry after 1600. Treatment of formal elements and genre categories. Dual listed with GERM 4180. *Prerequisite:* GERM 2140.

5240. German Literature of the Romantic Period. 3. An introduction to the philosophical bases of German Romanticism and analysis of representative works of prose and poetry. Dual listed with GERM 4240. *Prerequisite:* GERM 2140 or equivalent.

5255. 19th Century German Novellas. 3. Studies a wide selection of German novellas from the period when this genre flourished in the German-speaking world, with a popularity unparalleled in the rest of Europe. Examines the form's origins, evolution, reception, and theory. Dual listed with GERM 4255. *Prerequisite:* GERM 2140 or equivalent.

5275. Contemporary Migration Literature. 3.

Introduces students to a range of recent cultural productions by artists identified with immigrant communities or communities of color. Topics examined include: the intersections of gender, race, culture, and class; experiences of different minorities in unified Germany; question of national and transnational identity, self-representation, immigration, multiculturalism and integration debates. Taught in German. Students are expected to read, write and discuss in German. Dual listed with GERM 4275. *Prerequisite:* GERM 2140 or equivalent.

5285. 20th/21st Century German Film. 3. Introduces students to classical German films, and thereby enhances their skills to conduct research in the Humanities. Themes to be

discussed: representation of authority, issues of race and gender, German culture and history, the Americanization of German culture, minorities in contemporary German. Taught in English. Dual listed with GERM 4285. *Prerequisites:* graduate standing.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

Greek (GRK)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1010. First Year Greek I. 4. Studies fundamentals of grammar, composition and reading in Classical Greek. (Offered based on sufficient demand and resources)

1020. First Year Greek II. 4. Studies grammar, composition and reading in Classical Greek. *Prerequisite:* GRK 1010. (Offered based on sufficient demand and resources)

2030. Second Year Greek. 4. Explores reading simple texts, stories and dramas, as well as grammar review. *Prerequisite:* GRK 1020 or equivalent. (Offered based on sufficient demand and resources)

2040. Second Year Greek II. 4. Further studies in grammar and reading simple texts, stories, and dramas. (Offered based on sufficient demand and resources.) *Prerequisites:* GRK 2030 or the equivalent.

3990. Independent Study. 1-4 (Max. 12). Encompasses independent reading, selected in consultation with instructor. *Prerequisite:* GRK 1020 or equivalent. (Offered based on sufficient demand and resources)

Japanese (JAPN)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1010. First Year Japanese I. 4. [(none)◀▶H] Studies fundamentals of grammar, composition, conversation and reading. Introduces Japanese culture through the language. (Offered fall semester)

1020. First Year Japanese II. 4. [(none)◀▶H] Studies fundamentals of grammar, composition, conversation and reading. Introduces

Japanese culture through the language. *Prerequisite:* JAPN 1010 or equivalent. (Offered spring semester)

2030. Second Year Japanese I. 4. Encompasses reading, speaking and writing in original Japanese syllabaries, including elementary kanji characters for daily practical application. *Prerequisite:* JAPN 1020 or equivalent. (Offered fall semester)

2040. Second Year Japanese II. 4. Encompasses reading, speaking and writing in original Japanese syllabaries, including elementary kanji characters for daily practical application. *Prerequisites:* JAPN 1020 and 2030 or equivalent. (Offered based on sufficient demand and resources)

2070. Conversational Japanese Abroad. 4. Japanese language and cultural study in Japan led by UW faculty. *Prerequisite:* JAPN 1020.

3050. Third Year Japanese I. 3. Stresses usage of the language through composition, conversation, oral presentation and grammar review. *Prerequisite:* JAPN 2040 or equivalent. (Offered based on sufficient demand and resources)

3060. Third Year Japanese II. 3. Stresses usage of the language through composition, conversation, oral presentation and grammar review. *Prerequisites:* JAPN 2040 and 3050 or equivalent. (Offered based on sufficient demand and resources)

3990. Independent Study. 1-4. Projects in language or literature designed to meet specific student needs or interests, selected in consultation with faculty; independent reading and reports. *Prerequisite:* JAPN 2030.

4070. Fourth Year Japanese I. 3. Incorporates intensive grammar review and combination skill development. Also emphasizes specialized lexicons, written and oral translations, conversational fluency and additional kanji characters. *Prerequisite:* JAPN 3060. (Offered based on sufficient demand and resources)

4990. Advanced Independent Study. 1-3 (Max. 6). Encompasses special projects pertaining to Japanese language or literature to meet needs of individual students designed in consultation with instructor. *Prerequisites:* JAPN 3050 and consent of instructor. (Offered based on sufficient demand and resources)

Language (LANG)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

1101. First-Year Seminar. 3. [(none)♦FYS]
2150. Manga: History and Culture. 3. [(none)♦COM2] Manga is one of the most important art forms to emerge from Japan. Its importance as a medium of visual culture and storytelling cannot be denied. Through reading and examination of texts, students will understand the relevance of comics in Japanese society. *Prerequisite:* COM1.

3105. Major Themes in Chinese and Japanese Literature. 3-4 (Max. 4). Explores mindsets of two rich and ancient civilizations, China and Japan. Considers distinctive characters of each civilization, while illuminating basic elements that we share with these peoples. *Prerequisite:* ENGL 1010.

3140. Anime: History and Culture. 3. [G,WB♦(none)] An introduction to the history, development, and cultural significance of Japanese animation. Through the examination of a variety of anime genres, students will gain insight into contemporary Japan as well as important historical periods. We will read analyses of particular anime, emphasizing the unique characteristics of the art and the mystery of its popularity in the US. *Prerequisite:* completion of WA.

4485. Latin Diaspora: Comparative History of U.S. 3. History of U.S. Latino peoples including Mexican Americans, Puerto Ricans, Cubans, Dominicans, Central Americans, South Americans and Spaniards. Historical context, origins, development of Latin American national, cultural identities, regional characteristics, immigration; nativist responses; assimilation, cultural continuity and change. Similarities, general patterns and differences, Hispanic and Pan Latino identities and probable future trends. *Prerequisite:* HIST 2370 or 2380 or LTST 1100.

4785. Linguistics, Language Teaching and Social Context. 3. Introduces prospective teachers of English as second language to the basic components of language and to the social aspects of human language use. Explores a variety of concepts about language: how it is used and perceived, how languages change, how diverse cultures respond to such changes. Cross listed with ENGL 4785. *Prerequisite:* WB.

4800. Advanced Instruction In: ____ 1-3 (Max. 12). Advanced study and projects designed to meet special needs and interests of students, to be selected in consultation with a suitable member of the faculty. *Prerequisite:* consent of instructor.

4975. Independent Study In: __. 1-3 (Max. 12). Further work in a less commonly taught language, for students who have at least four semesters of study or comparable proficiency. *Prerequisite:* LANG 2040 or equivalent.

5300. Advanced Linguistics. 3. Data is offered to provide the opportunity to analyze phonological, morphological, and syntactic materials from languages throughout the world. Attention is given to the limits within which these aspects of human language appear to vary. *Prerequisite:* ANTH/ENGL/LANG 4750.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Students are expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

Other Languages (LANG)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

Modern languages not listed above are offered under the following listings in the class schedule:

1010. First Semester in __. 1-4 (Max. 12).

1020. Second Semester in __. 1-4 (Max. 12). *Prerequisite:* LANG 1010.

2030. Third Semester in __. 1-4 (Max. 12). *Prerequisites:* LANG 1010, LANG 1020.

2040. Fourth Semester in: __. 3. [(none)♦H] Encompasses formal grammar introduction and review; periodic composition; as well as drill of oral skill including pronunciation, oral reports and free conversation. *Prerequisite:* Satisfactory completion of corresponding study in LANG 2030.

Latin (LATN)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

1010. First Year Latin I. 4. [(none)♦H] Studies fundamentals of grammar, composition and reading. (Offered fall semester)

1020. First Year Latin II. 4. [(none)♦H] Studies fundamentals of grammar, composition and reading. *Prerequisite:* LATN 1010 or equivalent. (Offered spring semester)

2030. Second Year Latin. 4. Reading simple texts, short stories and dramas, as well as grammar review and conversation. *Prerequisite:* LATN 1020 or equivalent. (Offered fall semester)

3110 [2110]. Vergil, The Aeneid I. 3. Reading portions of the Aeneid and consideration of its literary interpretation. *Prerequisite:* LATN 2030 or equivalent.

3120 [2120]. Vergil, The Aeneid II. 3. Reading further portions of the Aeneid and consideration of its literary interpretation. *Prerequisite:* LATN 3110. (Offered based on sufficient demand and resources)

3140. Caesar. 2. Acquaints students with war-memoir genre of Latin literature. *Prerequisite:* LATN 2030 or equivalent. (Offered based on sufficient demand and resources)

3150. Livy. 3. Reading portions of Livy's historical works, and consideration of the history he covers and how the Romans viewed their past. *Prerequisite:* LATN 2030 or equivalent. (Offered based on sufficient demand and resources)

3160. Ovid. 2. *Prerequisite:* LATN 2030 or equivalent. (Offered based on sufficient demand and resources)

3990. Independent Study. 1-4 (Max. 12). Books or texts of special interest to the student, selected in conjunction with the instructor; independent reading and reports. *Prerequisite:* LATN 2030 or equivalent. (Offered based on sufficient demand and resources)

4110. Horace. 3. *Prerequisite:* LATN 2030 or equivalent. (Offered based on sufficient demand and resources)

4115. Latin Philosophers. 3. An introduction to Latin philosophical traditions. Readings will be selected either from one author, such as Lucretius (ca. 99-55 BCE) or Seneca the Younger (ca. 4 BCE-65 CE), or from different authors about a given theme. *Prerequisite:* LATN 2030 or equivalent. (Offered based on sufficient demand and resources)

4120. Catullus and the Elegiac Poets. 3. Discusses Latin lyric poetry of late Republic and early Empire, excluding works of Horace and Ovid, and elegiac tradition in Latin. *Prerequisite:* LATN 2030 or equivalent. (Offered based on sufficient demand and resources)

4130. Cicero. 3. Introduction to the prose of the statesman Marcus Tullius Cicero (106-43 BCE). Readings will be selected from his political speeches, correspondences, or treatises on philosophical, rhetorical, and religious topics. *Prerequisite:* LATN 2030 or equivalent. (Offered based on sufficient demand and resources)

Spanish (SPAN)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦♦Q]).

1010. First Year Spanish I. 4. [(none)♦♦H] Studies fundamentals of grammar, composition, conversation and reading.

1020. First Year Spanish II. 4. [(none)♦♦H] Studies fundamentals of grammar, composition, conversation and reading. *Prerequisite:* SPAN 1010 or two years of high school Spanish.

1101. First-Year Seminar. 3. [(none)♦♦FYS]
2030. Second Year Spanish I. 4. [(none)♦♦H] Encompasses reading, grammar review, compositions and conversation. *Prerequisite:* SPAN 1020 or three years of high school Spanish.

2040. Second Year Spanish II. 4. [(none)♦♦H] Stresses usage of the language through composition, conversation, oral presentation and grammar review. *Prerequisite:* SPAN 2030 or three years of high school Spanish.

2140. Introduction to Reading. 3. [CH,G♦♦(none)] This course introduces a varied selection of readings and other cultural media in an immersive, intensive language class. Through the study of short stories, media articles, films, etc., students learn cultural aspects of the Spanish-speaking world and are able to practice and improve their communicative abilities. *Prerequisite:* SPAN 2030 or equivalent.

3030. Spanish for Heritage Speakers. 3. [(none)♦♦COM2] Stresses academic use of the Spanish language by native or near-native speakers, through composition, cultural readings, oral presentations, and digital interactions. This class will prepare native and near-native speakers for Spanish upper division classes. It will review spelling rules, grammatical terminology, dialectal and register differences, and academic vocabulary. *Prerequisites:* SPAN 2040 and consent of instructor.

3040. Spanish Conversation. 3. Emphasizes speaking and listening comprehension through structured and monitored individual, pair, small group and class work, while providing socio-cultural competence, vocabulary acquisition and grammar review. Provides enhanced language skills in a manner that otherwise could only be attained through an extended stay in a Hispanic country. *Prerequisite:* SPAN 2040; limited to Spanish majors/minors with no previous experience abroad.

3050. Third Year Spanish I. 3. [WB♦♦COM2] Stresses usage of the language through composition, conversation, oral presentation and grammar review. *Prerequisite:* SPAN 2040.

3060. Third Year Spanish II. 3. Intensively reviews grammar and composition-skill development. Also emphasizes specialized lexicons, written and oral translation, as well as conversational fluency. *Prerequisite:* SPAN 3050.

3070. Intensive Spanish Abroad. 3 (Max. 9). Spanish language and cultural study in Spanish-speaking countries led by UW faculty. *Prerequisite:* SPAN 2030 or consent of instructor.

3080. Spanish Language in the USA. 3. [(none)♦♦H] This course studies the Spanish language in its social context as a language of the United States, through concepts such as: social and individual bilingualism, Spanglish, dialects, language contact, borrowings, code switching, language policy, or language ideology. Cross listed with LTST 3080. *Prerequisite:* SPAN 3050 or SPAN 3060 or instructor's consent.

3100. Survey of Spanish Literature. 3. Studies Spanish literature from the Middle Ages to the end of the 17th century. *Prerequisite:* SPAN 2140 or equivalent. SPAN 3140 strongly recommended.

3110. Survey of Contemporary Spanish Literature. 3. Studies Spanish literature from the 18th to the 21st century. SPAN 3110 is a continuation of SPAN 3100, which studies Spanish literature from the Middle Ages to the end of the 17th century. In order to take 3110, students do not need to take 3100. SPAN 3140 strongly recommended. *Prerequisite:* SPAN 2140 or equivalent.

3120. Survey of Spanish American Literature. 3. [G♦♦(none)] Surveys Spanish American literature from colonial period to the present. *Prerequisite:* SPAN 2140 or equivalent.

3140. Introduction to Literature. 3. This course introduces literary analysis by focusing on different genres from the Hispanic tradition. The course is focused on developing interpretation strategies and it introduces key elements of literary criticism. Students are required to produce complex ideas about the texts, give oral presentations, and write essays on the texts read. *Prerequisite:* SPAN 2140 or SPAN 3030 or SPAN 3050.

3200. Spanish Culture and Civilization. 3. Studies the evolution of Spanish culture through its main artistic, sociological and intellectual expressions. *Prerequisite:* SPAN 2040, 2140.

3220. Spanish-American Cultures in Context. 3. Introduction to the Spanish-speaking cultures of Latin America and the United States through a historical overview and a focus on contemporary politics and culture. *Prerequisite:* SPAN 2040 or SPAN 2140 or consent of instructor.

3300 [4310]. Introduction to Hispanic Linguistics. 3 (Max. 9). Overview of basic concepts and approaches to linguistics with examples from and emphasis on Spanish description. Basic concepts in semiotics, formal and non-formal linguistics, core areas in linguistics (phonetics & phonology, morphosyntax, semantics & pragmatics), as well as an overview of subfields of linguistics (psycholinguistics, sociolinguistics, computational linguistics, etc.). *Prerequisites:* SPAN 3050 or equivalent proficiency.

3990. Independent Study. 1-4 (Max. 4). Encompasses books or periodicals of special interest to the student, selected in consultation with a staff member. Includes independent reading and reports. *Prerequisite:* SPAN 2030.

4070. Spanish Variation and Change. 3. Provides a general overview of issues in language change in the contemporary Spanish-speaking world. General topics include language vs. dialect, social factors affecting language variation/acquisition/maintenance, mechanisms of change, language contact effects, language attitudes, policy and planning, style and register and mixing of languages and bilingualism, among other, as they are seen in the Spanish language. Dual listed with SPAN 5070. *Prerequisite:* SPAN 3300 or LANG 4750 or consent of instructor.

4080. Spanish Advanced Grammar. 3 (Max. 9). Intensive practice of Spanish grammar through syntactic analysis to raise language awareness. Study of Spanish grammar in connection with information theory and semantic roles, with a focus on complex sentences and different phenomena such as preposition requirements, word order, emphatic structures, etc. Dual listed with SPAN 5080. *Prerequisite:* SPAN 3300 or LANG 4750 or consent of instructor.

4090. Spanish Phonetics and Phonology. 3. Provides a description of Spanish sound system and general survey of the language's major dialectal variations. Will touch upon acoustic phonetics and focus on articulatory phonetics. Practice of phonological processes that affect the pronunciation of the language. It includes an explanation of main sources for a foreign accent in Spanish. Dual listed with SPAN 5090. *Prerequisite:* SPAN 3300 or LANG 4750 or consent of instructor.

4095. Advanced Translation. 3 (Max. 6). A practical approach to translating techniques and elements of oral interpretation. *Prerequisite:* SPAN 3060.

4125. Spanish-Language Literatures of the Americas. 3 (Max. 9). Examines Spanish American literature from a wide variety of perspectives: geographical regions (e.g. Caribbean, Andean, greater Mexico), theme

(e.g. revolution, borders), period (e.g. Colonial, 19th century), or genre (e.g. poetry, theatre, film, non-fiction). *Prerequisite:* SPAN 3050 or equivalent. SPAN 3120 highly recommended.

4130. Masterpieces of Spanish Renaissance Literature. 3. Studies Spanish Renaissance, taking into consideration social, political, economic, religious, philosophical and aesthetic aspects of the culture as a context for and as reflected in the literature. Dual listed with SPAN 5130. *Prerequisites:* SPAN 3030 or SPAN 3050, and SPAN 3140.

4140. Masterpieces of Spanish Baroque Literature. 3. Studies Spanish Baroque, taking into consideration social, political, economic, religious, philosophical and aesthetic aspects of the culture as a context for and as reflected in the literature. Also covers relationship between Spanish Renaissance and Baroque. Dual listed with SPAN 5140. *Prerequisites:* SPAN 3030 or SPAN 3050, and SPAN 3140.

4150. Spanish Romanticism. 3. Comprehensively studies romantic movement in Spain. Includes close reading and commentary of texts by authors such as Espronceda, Rivas, Zorrilla, Becquer and de Castro. Dual listed with SPAN 5150. *Prerequisites:* SPAN 3030 or SPAN 3050, and SPAN 3140.

4170. Contemporary Spanish Prose. 3. Examines contemporary prose fiction of Spain. Studies authors who gained recognition before and after the 1936 Spanish Civil War. *Prerequisites:* SPAN 3030 or SPAN 3050, and SPAN 3140.

4180. Advanced Cultural Studies in Hispanic Lit/Media. 3. Advanced analysis of Hispanic cultural phenomena. Focus on the Spanish-speaking cultures of Spain or the Spanish-speaking Americas or both. The Texts consulted vary according to instructor and may include the visual arts, such as film, paintings, and performance, academic theory, websites, and other fiction and non-fiction readings. Dual listed with SPAN 5180. *Prerequisites:* SPAN 2140 or equivalent and one 4000-level course.

4190. 20th and 21st Century Spanish-American Texts. 3. Provides students the opportunity to study representative literary texts that reflect the tendencies and trends in 20th and 21st Century Spanish-language works of the Americas. Dual listed with SPAN 5190. *Prerequisite:* 6 hours of Spanish literature at 4000-level.

4200. Introduction to Research. 3 (Max. 9). [WC◀COM3] Senior seminar on a topic varying from year to year. Includes study of standard bibliographical guides. Minimum of

3 hours recommended for majors. *Prerequisites:* SPAN 3030 or SPAN 3050 and 3 hours of 4000 or 5000-level courses.

4260. The Realist Novel in Spain. 3. Studies major novelists of 19th century Spain from 1850 until Generation of '98. Dual listed with SPAN 5260. *Prerequisite:* SPAN 3030 or SPAN 3050, and SPAN 3140.

4600. Special Topics in Spanish. 1-6 (Max. 12). Presents a variety of significant literature, language, or cultural topics in Latin American, Peninsular, and other Spanish-speaking communities. *Prerequisite:* SPAN 3030 or SPAN 3050.

4990. Advanced Independent Study. 1-3 (Max. 6). Encompasses special projects to meet needs of individual students, designed in consultation with instructor. *Prerequisites:* SPAN 3030 or SPAN 3050.

5070. Spanish Variation and Change. 3. Provides a general overview of issues in language change in the contemporary Spanish-speaking world. General topics include language vs. dialect, social factors affecting language variation/acquisition/maintenance, mechanisms of change, language contact effects, language attitudes, policy and planning, style and register and mixing of languages and bilingualism, among other, as they are seen in the Spanish language. Dual listed with SPAN 4070. *Prerequisite:* graduate standing.

5080. Spanish Advanced Grammar. 3 (Max. 9). Intensive practice of Spanish grammar through syntactic analysis to raise language awareness. Study of Spanish grammar in connection with information theory and semantic roles, with a focus on complex sentences and different phenomena such as preposition requirements, word order, emphatic structures, etc. Dual listed with SPAN 4080. *Prerequisite:* graduate standing.

5090. Spanish Phonetics and Phonology. 3. Provides a description of Spanish sound system and general survey of the language's major dialectal variations. Will touch upon acoustic phonetics and focus on articulatory phonetics. Practice of phonological processes that affect the pronunciation of the language. It includes an explanation of main sources for a foreign accent in Spanish. Dual listed with SPAN 4090. *Prerequisite:* graduate standing.

5100. Hispanic Thought. 3. intensive study of a topic, author, or philosophical movement. Designed for upper level and graduate students. *Prerequisite:* 12 hours of Spanish literature at 4000-5000 level.

5110. Peninsular Spanish Literature. 1-3 (Max. 9). An intensive study of a topic or an author. Designed for upper level and graduate students. *Prerequisite:* 12 hours of Spanish literature at 4000-5000 level.

5120. Spanish American Literature. 1-3 (Max. 9). An intensive study of a topic or an author. Designed for upper level and graduate students. *Prerequisite:* 12 hours of Spanish literature.

5130. Masterpieces of Spanish Renaissance Literature. 3. A study of the Spanish Renaissance, taking into consideration social, political, economic, religious philosophical, and aesthetic aspects of the culture as a context for and as reflected in the literature. Dual listed with SPAN 4130. *Prerequisites:* SPAN 3030 or SPAN 3050, and SPAN 3140.

5140. Masterpieces of Spanish Baroque Literature. 3. Studies of the Spanish Baroque, taking into consideration social, political, economic, religious, philosophical, and aesthetic aspects of the culture as a context for and as reflected in the literature. Also covers the relationship between the Spanish Renaissance and the Baroque. Dual listed with SPAN 4140. *Prerequisites:* SPAN 3030 or SPAN 3050, and SPAN 3140.

5150. Spanish Romanticism. 3. A comprehensive study of the romantic movement in Spain. Close reading and commentary of texts by representative authors including Espronceda, Rivas, Zorrilla, Becquer and de Castro. Dual listed with SPAN 4150. *Prerequisites:* SPAN 3030 or SPAN 3050, and SPAN 3140.

5160. Graduate Readings. 1-5 (Max. 6). *Prerequisite:* graduate standing.

5170. Special Problems. 1-2 (Max. 6). *Prerequisite:* graduate standing.

5180. Advanced Cultural Studies in Hispanic Lit/Media. 3. Advanced analysis of Hispanic cultural phenomena. Focus on the Spanish-speaking cultures of Spain or the Spanish-speaking Americas or both. The Texts consulted vary according to instructor and may include the visual arts, such as film, paintings, and performance, academic theory, websites, and other fiction and non-fiction readings. Dual listed with SPAN 4180. *Prerequisite:* SPAN 2140 or equivalent and one 4000-level course.

5190. 20th and 21st Century Spanish-American Texts. 3. Provides students the opportunity to study representative literary texts that reflect the tendencies and trends in 20th and 21st Century Spanish-language works of the Americas. Dual listed with SPAN 4190. *Prerequisites:* 6 hours of SPAN at the 4000-level.

5260. The Realist Novel in Spain. 3. Studies of the major novelists of nineteenth century Spain from 1850 until the Generation of '98. Dual listed with SPAN 4260. *Prerequisite:* SPAN 3030 or SPAN 3050, and SPAN 3140.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

Life Sciences Program

107 Aven Nelson Building, 766-4158

Web site: www.uwyo.edu/lifescience

Program Director: Jonathan Prather

The Life Sciences Program consists of all LIFE prefix courses. These courses support a wide range of life science majors and several non-life science majors across campus. The number of LIFE courses taken by students in each major is determined by the departments that offer the majors. The curriculum intends to provide science majors with both breadth and depth in the basic life sciences, and non-science majors with exposure to key concepts in biology and an understanding of the connections between science and society. The program courses also expose students to the fields of cell and molecular biology, genetics, ecology, and evolution, and they familiarize students with the diversity of life on the planet. Courses within the curriculum address four fundamental goals at a level appropriate for each course:

1. Acquisition, Application and Synthesis of Knowledge
2. Communication Skills
3. Critical Thinking and Problem Solving
4. Research Skills

The Life Sciences courses listed below were previously offered under the BIOL prefix. All courses listed below are now offered through the LIFE prefix.

Life Sciences (LIFE)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

LIFE 1101. Introduction to Ecological Research. 3. [none]◀▶FYS Learn science by doing science! This course-based undergraduate research experience (CURE) will focus on beaver pond ecosystems in Medicine Bow National Forest. Students will engage in outdoor fieldwork in addition to classroom learning. They will carry out hands-on projects and gain experience in ecological sampling, lab work, data analysis, and scientific writing. Students who complete the course are encouraged to continue research and are eligible for summer internships.

1002 [BIOL 1002]. Discovering Science. 3. [S◀▶PN] Integrates Biology, Chemistry, Physics, and Earth Science and is intended for non-science majors. Fundamental concepts from each discipline are discussed through lectures and in-class activities, and students learn how to understand science and its importance in larger societal issues. There is no laboratory component of this course. Meets the S requirement in USP 2003 and the PN requirement in USP 2015. (Normally offered fall semester)

1003 [BIOL 1003]. Current Issues in Biology. 4. [SB◀▶PN] Emphasizes central themes of biology – cell biology, genetics, evolution, ecology – and scientific methodology by focusing on current issues in biology. Fundamental concepts are addressed through classroom and laboratory activities and discussions. This course is intended for non-science majors. Students cannot receive duplicate credit for LIFE 1010 or 1020. (Normally offered spring semester)

1010 [BIOL 1010]. General Biology. 4. [SB◀▶PN] Fundamental concepts of biology, including basic chemistry of living systems, cell structures and functions, energy relations, genetics, molecular biology, ecology, population dynamics and evolutionary theory. Living invertebrate and vertebrate organisms studied during some lab meetings. Laboratory is required. If you take LIFE 1010, you cannot get duplicate credit for LIFE 1000, 1003, or 1020. *Prerequisite:* Math ACT score of 23 or above, or concurrent enrollment or eligibility for concurrent enrollment in MATH 1400 or higher.

1020 [BIOL 1020]. Life Science. 4. [SB◀▶PN] An integrated lab and lecture emphasizing fundamental principles of biology including cell structure and function, genetics, ecology, evolution and organismal biology. Considers applications of these principles

to societal issues such as the conservation of biodiversity, overpopulation and global environmental changes, biotechnology, and human wellness and disease. If you take LIFE 1020, you cannot get duplicate credit for LIFE 1000, 1003, or 1010. *Prerequisites:* elementary education majors only; concurrent enrollment in EDEL 1430.

2002 [BIOL 2002]. Global Ecology. 3. [SB,G◀▶(none)] Provides a global perspective on ecological processes, biodiversity, climate change, and the environmental consequences of human actions. Students develop a global awareness of the role of ecology in international human affairs, and how this influences relationships between the developed and developing worlds. For majors and non-majors. *Prerequisite:* LIFE 1002, 1003, or 1010.

2022 [BIOL 2022]. Animal Biology. 4. An integrative course addressing the evolution, anatomy, physiology, and ecology of animals. Continues building upon the four themes in LIFE 1010, cell and molecular biology, genetics, evolution, and ecology. Preserved animal specimens are dissected during some labs. Intended for students majoring in the life sciences. Laboratory is required. *Prerequisite:* LIFE 1010 with a grade of C or better. (Normally offered spring semester)

2023 [BIOL 2023]. Biology of Plants and Fungi. 4. An integrated course dealing with the central themes of biology including cell and molecular biology, genetics, evolution and ecology of plants and fungi. Intended for students majoring in the life sciences. Laboratory is required. *Prerequisite:* LIFE 1010 with a grade of C or better. (Normally offered fall semester).

2050 [BIOL 2050]. Biology of Aging and Human Development. 3. Reviews cellular, physiological, endocrine, anatomical and nutritional aspects to aging. Format relates topics, such as exercise, nutrition and evolution, to aging. Students gain insight to problems related to research in aging and its potential impact on society. Uses video-taped lectures from field experts. *Prerequisite:* LIFE 1010. (Normally offered spring semester)

2100. Introduction to Research and Analysis. 4. [(none)◀▶Q] Students gather and analyze data in the context of life science research projects. provides a foundation in research design, probability and inference, and basic computational skills to support graphical and formal analyses of research data. *Prerequisite:* LIFE 1010 with a grade of C or better.

2300 [AS 2100]. Scientific Communication. 3. [(none)◀▶COM2] The course is primarily designed for undergraduate students in STEM (science, technology, engineering, and math) disciplines who are conducting, or intend to

conduct, independent research projects. Sharing research findings with the public is an essential, though often overlooked, part of the job of those in STEM fields. We will hone these techniques through a variety of written assignments, practice talks, group discussions and feedback, visits from guest speakers, and a semester-long research project. The overarching goal is for you to be able to deliver an engaging research talk. *Prerequisite:* C or better in COM1.

3050 [BIOL 3050/BIOL 4000]. Genetics. 4. Introduces principles of heredity and variation in living organisms, including a study of the nature of the genetic material and its transmission, influence of heredity and environment on the development of individual characters, as well as evolution of organisms and artificial selection of plant and animal varieties. Emphasizes application to today's society. *Prerequisite:* completion of LIFE 1010 and one of LIFE 2022, 2023, MICR/MOLB 2021, or MICR/MOLB 2240 with a grade of C or higher in each.

3400 [BIOL 3400/ BIOL 2400]. General Ecology. 3. Presents fundamental concepts in population and ecosystem ecology. Emphasizes basic principles and their use in manipulated ecosystems. *Prerequisite:* completion of LIFE 1010 and one of LIFE 2022, 2023, MICR/MOLB 2021, or MICR/MOLB 2240 with a grade of C or higher in each.

3410 [BIOL 3410/BIOL 2410]. Introduction to Field Ecology. 2. Field and laboratory course. Introduces methods used in plant and animal ecology. *Prerequisite:* LIFE 3400 (may be concurrently enrolled). (Normally offered fall semester)

3500 [BIOL 3500]. Evolutionary Biology. 3. Presents modern evolutionary theory. Examines evolution and evolutionary mechanisms from several viewpoints, with particular attention given to genetic mechanisms underlying processes of evolution and speciation. *Prerequisites:* completion of LIFE 1010 and LIFE 3050 with a grade of C or higher in each. (Normally offered fall semester)

3600 [BIOL 3600/ BIOL 4600]. Cell Biology. 4. Focuses on cell structure, cell function and the regulation of cell processes. Examines many levels of organization, ranging from single molecules and individual cells to multi-cellular systems and the whole organism. Discussion section is required. *Prerequisites:* completion of LIFE 1010 and one of LIFE 2022, 2023, MICR/MOLB 2021, or MICR/MOLB 2240 with a grade of C or higher in each.

4975 [BIOL 4975]. Practicum in Laboratory Teaching. 1-3 (Max. 3). Intended to give undergraduate students experience teaching in a laboratory setting. Working closely with an instructor and a graduate teaching assistant,

students will assist in the teaching of biology laboratories during the semester and participate in weekly sessions centered on teaching, learning and assessment. 1 to 3 credits of Satisfactory/Unsatisfactory credit. *Prerequisites:* completion of a 1000-level LIFE course and consent of instructor.

4976 [BIOL 4976]. Practicum in Laboratory Teaching II. 1-3 (Max 3). Intended to build on the foundations of LIFE 4975. Students work under the dual supervision of the course instructor and the graduate teaching assistant to gain further first hand experience with teaching in life sciences laboratories during this semester. 1 to 3 credit hours of Satisfactory/Unsatisfactory credit. *Prerequisite:* LIFE 4975.

Department of Mathematics and Statistics

Mathematics

202 Ross Hall, (307) 766-4221

FAX: (307) 766-6838

Web site: www.uwyo.edu/mathstats/

Department Head: Jason Williford

Professors:

MYRON B. ALLEN III, A.B. Dartmouth College 1976; M.A. Princeton University 1978; Ph.D. 1983; Professor of Mathematics 1992, 1983.

HAKIMA BESSAIH, M.S. University of Algiers 1992; Ph.D. Scuola Normale Superiore of Pisa 1999; Professor of Mathematics 2015, 2004.

CRAIG C. DOUGLAS, B.A. University of Chicago 1977; M.S. Yale University 1978; M.Phil. 1981; Ph.D. 1982; SER Professor of Mathematics 2008.

VICTOR GINTING, B.S. Institut Teknologi Bandung Indonesia 1995; M.S. Texas A&M University 1998; Ph.D. 2004; Professor of Mathematics 2017, 2007.

STEFAN HEINZ, B.S. Humboldt University 1985; M.S. 1986; Ph.D. Heinrich-Hertz Institute 1990; Professor of Mathematics 2013, 2004.

FARHAD JAFARI, B.S. University of Wisconsin-Madison 1978; M.S. 1980; Ph.D. 1983; M.A. 1986; Ph.D. 1989; Professor of Mathematics 1999, 1991.

LONG LEE, B.S. National Taiwan University, Taipei 1988; M.A. University of Maryland 1998; Ph.D. University of Washington 2002; Professor of Mathematics 2018, 2005.

G. ERIC MOORHOUSE, B.S. University of Toronto 1980; M.S. 1984; Ph.D. 1987; Professor of Mathematics 2011, 1989.

BRYAN L. SHADER, B.S. University of Wyoming 1984; M.S. University of Wisconsin-Madison 1987; Ph.D. 1990; Professor of Mathematics 2000, 1990.

Associate Professors:

MICHELLE T. CHAMBERLIN, B.S. Colorado State University 1997; M.S. 1999; Ph.D. Purdue University 2002; Associate Professor of Mathematics 2012, 2007.

FREDERICO da CUNHA FURTADO, B.S. Federal University of Minas Gerais 1979; M.S. Federal University of Rio de Janeiro 1984; Ph.D. Courant Institute 1989; Associate Professor of Mathematics 2002, 1997.

RONGSONG LIU, B.A. Henan Normal University 1999; M.A. Fudan University 2002; Ph.D. York University 2006; Associate Professor of Mathematics and Program in Ecology 2015, 2009.

ZHUANG NIU, B.S. Wuhan University 1998; M.S. 2001; Ph.D. University of Toronto 2005; Associate Professor of Mathematics 2015, 2012.

TYRRELL McALLISTER, B.S. University of California, Davis 2001; Ph.D. 2006; Associate Professor of Mathematics 2015, 2009.

DAN STANESCU, B.Eng. Polytechnic Institute, Romania 1986; M.Eng. McGill University, 1994; Ph.D. Concordia University 1999; Associate Professor of Mathematics 2008, 2003.

JASON WILLIFORD, B.A. University of Pennsylvania 1998; Ph.D. University of Delaware 2004; Associate Professor Mathematics 2014, 2009.

MAN-CHUNG YEUNG, B.S. Jinan University, China 1986; M.Ph. University of Hong Kong 1990; Ph.D. University of California-Los Angeles 1997; Associate Professor of Mathematics 2005, 2001.

Assistant Professor:

PINGZHONG, B.S. Huanzhong University 2005; M.S. Peking University 2008; Ph.D. Indiana University 2014; Assistant Professor of Mathematics 2018.

Senior Lecturers:

DAVID ANTON, B.S. North Dakota State University 2001; M.S. University of Wyoming 2007; Senior Lecturer in Mathematics 2017, 2005.

WILLIAM WEBER, B.S. Colorado State University 1979; B.S. University of Wyoming 1988; M.S. 1992; Senior Lecturer in Mathematics 2012, 2001.

Associate Lecturer:

NATHAN CLEMENTS, B.S. Brigham Young University-Idaho 2007; M.S. Idaho State University 2009; D.A. 2012; Associate Lecturer in Mathematics 2019, 2012.

Assistant Lecturer:

ERIC QUADE, B.S. University of Wyoming 2005; Ph.D. 2012; Assistant Lecturer in Mathematics 2016.

Adjunct Professors:

Saman Aryana, Li Deng Douglas, Benedetta Ferrario, Maria Garrido-Atienda, John Hitchcock, Robert Kansky, David Meyer, Bjorn Schmalfluss, Gerald Schuster, Dongwo Sheen, Marie-Agnés Tellier

Professors Emeriti:

Charles Angevine, Leonard Asimow, Robert Buschman, Benito M. Chen-Carpentier, George C. Gastl, John H. George, Sylvia A. Hobart, Syed Husain, Peter Polyakov, A. Duane Porter, Ben G. Roth, John Rowland, Chanyoung Lee Shader, Raymond Smithson, John Spittler.

“For the things of this world cannot be made known without a knowledge of mathematics.”--Roger Bacon

Virtually every student at UW will take one or more math courses to fulfill graduation requirements. The intent is to illustrate the esthetics inherent in mathematics, and to provide students with the quantitative skills needed for today's careers.

Mathematics majors receive a broad and deep view of the mathematical sciences. They develop their mathematical thinking and communications skills in algebra, analysis, and applied math. They learn a variety of technological tools necessary for jobs in education, business, government, and industry. In addition to our math classes, the department offers a variety of opportunities to enrich the undergraduate experience. Students can participate in weekly seminars, summer research projects, Putnam Team competitions, and the math club.

Mathematics Placement

All UW math courses have prerequisites which are detailed in the course listings below. These are to assure that each student has the best possible opportunity for success in the course. In accordance with this, *all students registering for a math course will have their records checked in order to determine whether the prerequisite is satisfied.*

A computerized prerequisite check is run prior to the start of every semester. *Students who preregistered for a math course but have not satisfied the prerequisites at the time of the check will be automatically dropped from the course.*

Prerequisites for courses numbered 0921-1100, 1400-1450, 2200, 2350, and 2355 may be satisfied in one of four ways:

1. Obtain a grade of C or better in a prerequisite course. Note that non-credit courses from out-of-state colleges are not accepted as prerequisites.
2. Pass the Mathematics Placement Exam (MPE) at the stated level within one year of the start of the course.
3. Obtain a sufficiently high score on one of the following standardized exams within three years of the start of the course: ACT math score or SAT math score.
4. Obtain a sufficiently high score on one of the following standardized exams: AP Calculus, CLEP, or IB.

More information on mathematics placement may be obtained from 766-6831, math-registration@uwyo.edu, or at www.uwyo.edu/mathstats/math-placement.

Duplication of Courses (MATH 1400, 1405, 1450)

To avoid loss of credit because of duplication of course content, please note the following: (a) students with credit for both MATH 1400 and MATH 1405 will not receive new credit by taking 1450; (b) students with credit for one of MATH 1400 or MATH 1405 will receive only 2 additional credits by taking MATH 1450; (c) students with credit for MATH 1450 will receive only 1 additional credit by taking both MATH 1400 and MATH 1405. Note that the GPA calculation for these situations is unusual, and students should ask the Registrar's Office for details.

Note that MATH 1450 counts as one attempt at each of MATH 1400 and 1405 for the purposes of repeating classes.

Undergraduate Major

The department offers both a B.S. and B.A. degree in Mathematics. A degree in mathematics should prepare students to enter either graduate studies or the workforce with a skill set that could only come from an intense study of both quantitative reasoning and rigorous proof. This can be accomplished by focusing on the following goals for our undergraduate major:

1. Develop mathematical thinking and communication skills
2. Develop skills with a variety of technological tools
3. Provide a broad view of the mathematical sciences
4. Require study in depth

The required lower division core courses for a mathematics major are Calculus 1, 2, and 3 (MATH 2200,2205,2210), Differential

Equations (MATH 2310), Linear Algebra (MATH 2250), and the Math Major Seminar (MATH 2800).

At the upper division, all mathematics majors must take Analysis 1 (MATH 3205), Algebra 1 (MATH 3500) and Introduction to Scientific Computing (MATH 3340). These courses, known as the transition courses, introduce students to the three main areas of mathematics research currently represented in the department.

Every mathematics major must select one two-course sequence (MATH 4200/4205, MATH 4510/4520, or MATH 4340/4440) that builds on the corresponding transition course. This sequence provides the student with an opportunity to study one of these areas in greater depth.

Finally, an additional 12 credits of upper division math courses (3000 and above) are required. It is recommended that these courses be selected to provide a broad view of mathematics.

Two of the math electives may be chosen from a list of approved courses that have significant math content, upon approval by the student's advisor. More details about such courses are available on the math department's web site, www.uwyo.edu/mathstats/.

Only grades of C or better will be accepted for the major.

Undergraduate Minor

The minor in mathematics focuses on fundamental aspects of mathematics that are essential for further study in mathematics and are also useful in a variety of other disciplines. Students minoring in mathematics may customize the minor by choosing the appropriate transition course and upper-division electives to match their needs.

The required lower division core courses for a mathematics minor are Calculus 1, 2, and 3 (MATH 2200,2205,2210), Differential Equations (MATH 2310), Linear Algebra (MATH 2250), and the Math Major Seminar (MATH 2800).

At the upper division, all mathematics minors must take ONE of Analysis 1 (MATH 3205), Algebra 1 (MATH 3500) or Introduction to Scientific Computing (MATH 3340), as well as 6 additional credits of upper division math courses (3000 and above).

Two of the math electives may be chosen from a list of approved courses that have significant math content, upon approval by

the student's advisor. More details about such courses are available on the math department's web site, www.uwo.edu/mathstats/.

Only grades of C or better will be accepted for the minor.

Undergraduate Interdisciplinary Computational Science Minor

In recognition of the importance of modeling and simulation in an increasing number of applications, the Undergraduate Interdisciplinary Computational Science Minor is intended to help prepare science, math, and engineering students for leading roles in their professions.

The Undergraduate Minor in Computational Science is based on the following requirements:

1. The student must earn 15 credit hours in specified courses.
2. Within the 15 credits, the student must earn 9 credits at the upper-division level (3000 or above).
3. Within the 15 credits, the student must earn 6 credits outside of her/his major.
4. Within the 15 credits, the student must earn at least 6 credits in core courses.
5. Only grades of C or better will be accepted for the minor.

The 15 hours of coursework are divided between core and elective courses as listed below.

Core Courses:

- Numerical Analysis (Math 4340/COSC 4340)
- High-Performance Computing (Offered as a topics course).
- Scientific Computing (MATH 3340/COSC 3340).
- Statistical Computing and Modeling (STAT 4460).

Elective Courses

- Computational Biology (BOT 4550/5550)
- Algorithms and Data Structures (COSC 3020)
- Mathematical and Computational Methods in Physics (PHYS 4840)
- Molecular Modeling (CHEM 4560/5560)
- C with Numerical Methods for Engineers (ES 3070)
- Mathematical Modeling (MATH 4300)
- Introduction to Finite Element Methods (ME 4040)
- Principles of Database Systems (COSC 4820)

Graduate Study

The Mathematics Program offers programs leading to the degrees of master of arts, master of science, master of arts in teaching, master of science in teaching, and the doctor of philosophy.

The requirements for these degrees reflect our belief that mathematicians should have a broad foundation in the core areas of algebra, analysis, and applied mathematics as well as the experience of a more intensive investigation of a specialized area. We provide this within a flexible structure that recognizes the individual interests and varied backgrounds of our students.

Program Specific Admission Requirements

To be competitive for admission, applicants must have strong backgrounds in mathematics. Generally, this means a bachelor's degree in mathematics or a closely related discipline. All applicants should have substantial coursework beyond the calculus sequence; courses in differential equations, linear algebra, and, in particular, courses in abstract algebra and analysis are highly recommended. A solid performance on the GRE Subject Test in Mathematics can demonstrate the applicant's mastery of these subjects. The GRE Subject Test in Mathematics is therefore recommended but is not required.

The GRE General Test is required, with a minimum Quantitative Reasoning score of 157 and Verbal score of 143. International applicants need a composite TOEFL score of 76 or an IELTS score of 6.5.

ETS only reports TOEFL scores taken within two years of the date of request.

Requirements for Admission for M.A.T. or M.S.T.

Applicants are required to have:

- (a) A valid teaching endorsement in any state or educational requirements satisfied for secondary teaching;
- (b) courses equivalent to MATH 3205, 3500, 4000 and 4600;
- (c) a course in computer programming.

Students who enter the program with a deficiency in the courses listed in (b) must take them at UW, but these courses may not be counted toward the course requirements of the M.S.T./M.A.T. program.

Graduate Interdisciplinary Computational Science Minor

In recognition of the importance of modeling and simulation in an increasing number of applications, the Graduate Interdisciplinary Computational Science Minor is intended to help prepare science, math, and engineering students for leading roles in their professions.

Requirements

- The student must earn 15 credit hours in specified courses.
- Within the 15 credits, the student must earn at least 12 credits in graduate level classes (5000).
- Within the 15 credits, the student must earn 6 credits outside of her/his department.
- Only grades of B or better will be accepted for a course counting towards the minor.
- For all students, the 15 hours of coursework will be divided into 9 credit hours of core courses and 6 credit hours of electives.

Core Courses

- Computational Methods in Applied Sciences I (MATH 5310/COSC 5310), 3 hrs.
- Introduction to High-Performance Computing (COSC 5010), 3 hrs.
- Computational Methods II (MATH 5340/COSC 5340), 3 hrs.
- Computational Biology (BOT 4550/5550), 4 hrs.
- Groundwater Flow and Transport Modeling (GEOL 4030/5030), 3 hrs.
- Computational Fluid Dynamics I (ME 5461), 3 hrs.
- Computational Fluid Dynamics II (ME 5462), 3 hrs.
- Computational Methods in Statistics (STAT 5660), 3 hrs.

Electives

- Analysis of Algorithms (COSC 5110), 3 hrs.
- Advanced Bayesian Statistics (STAT 5680), 3 hrs.
- Bayesian Data Analysis (STAT 5380), 3 hrs.
- High-Performance Computing in Geosciences, 2 hrs.
- Mathematics Modeling of Processes (MATH 5320), 3 hrs.
- Molecular Modeling (CHEM 4560/5560), 3 hrs.

- Mathematical and Computational Methods in Physics (PHYS 4840), 3 hrs.
- Mathematical Modeling (MATH 4300), 3 hrs.

Graduate Assistantships

The mathematics program employs approximately 25 graduate assistants each year. Assistantships include a full tuition and fee waiver, a monthly living stipend, and health insurance. Ph.D. students normally receive a higher stipend than master's students.

Teaching assistants teach or assist with the teaching of an undergraduate course each semester.

Students may also compete for research assistantships, provided that their interests align with an externally funded research project.

Summer support is not guaranteed but is usually available through teaching and research opportunities.

Renewal of funding and continuation in the mathematics graduate program is dependent upon the student's adequate progress towards graduation and satisfactory completion of assistantship duties.

Program-Specific Degree Requirements

Master's Programs: M.A. and M.S. Plan A and Plan B

The math department maintains 4 tracks by which students may obtain a Master of Arts (M.A.) or Master of Science (M.S.) degree in mathematics.

The following requirements are common to all four tracks:

- The student must maintain a 3.000 cumulative GPA.
- The student must complete 30 hours of formal mathematics coursework at the 5000 level.
- As part of the 30 hours of formal 5000-level mathematics courses, the student must complete the following courses with a grade of B or better:
 - MATH 5200: Real Variables I,
 - MATH 5230: Complex Variables I,
 - MATH 5310: Computational Methods I
 - MATH 5400: Methods of Applied Mathematics I,
 - MATH 5500: Advanced Linear Algebra, and
 - MATH 5550: Abstract Algebra I..

- The student must pass the department's Foundation Exam. This exam covers material from advanced vector calculus and linear algebra at the upper-division undergraduate level and is offered before the beginning of each semester.
- Take one hour of the seminar 4970: Professional Development in Mathematics and one hour of the seminar 4970: Professional Development in Teaching.

In addition to the common elements above, students must select and complete one of the capstone experiences described in the tracks below.

Track #1: Master's Thesis (Plan A)

Within the 30 hours of 5000-level courses, the Plan A student must complete 4 hours of MATH 5960: Thesis Research. At least 26 hours of 5000-level coursework must be math-content courses (not thesis research).

The student must prepare a master's thesis (Plan A) and give an oral defense of the thesis. In the mathematics program, a Plan A thesis reports on the result(s) of independent and original research completed by the student under the direction of a faculty member. The thesis should describe the research and its results and be written to the standards of the appropriate area of mathematics.

Track #2: Master's Paper (Plan B)

The student must prepare a master's paper (Plan B) and give an oral defense.

To write a Plan B paper, the student must present an expository paper on a designated mathematical subject. Students are guided by their advisor in the subject matter and in the preparation of the paper. A successful paper and defense demonstrates that the student has mastered a substantial mathematical topic that is beyond those covered in formal foundational coursework.

Track #3: Coursework/Project (Plan B)

A second M.A. or M.S. option exists for the Plan B student. In lieu of writing a paper, the student takes a sequence of three 5000-level courses that all address a common mathematical theme. The sequence must be approved by the student's advisor and the mathematics graduate committee. Two of the courses must be mathematics-department offerings, and the third may be either a mathematics course (including reading/topics courses) or a course from another department in a related field.

- The student must complete an additional 6 hours of courses at the 5000 level. Thus, Track #3 requires the completion of 36 hours of graduate-level coursework.
- Within the 36 hours, the student must propose and complete with a grade of B or better an appropriate 3-course sequence
- The student will write a short paper illustrating how the common mathematical theme of the sequence manifests itself in the content of each course and give a presentation/defense of the paper.

In approving the student's proposal for this option, the graduate committee and the advisor will consider how the writing and independent study spirit of the Plan B option are fulfilled within the recommended plan.

Track #4: Qualifying Exam (Plan B)

A third M.A. or M.S. option exists for the Plan B student. In lieu of writing a paper or taking additional coursework, the student must take and pass the department's PhD Qualifying Examination in one of the three areas: Analysis, Algebra, or Applied Mathematics. These examinations focus on the material in the required courses.

- Pass one of the department's qualifying exams in:
 - Analysis (MATH 5200 and MATH 5230)
 - Algebra (MATH 5500 and MATH 5550)
 - Applied Mathematics (MATH 5310 and MATH 5400)
- The oral component of this Track will consist of a defense of the student's written answers to qualifying exam.

These examinations are given twice a year at the beginning of the fall and spring semesters. This option is intended for students who will continue for a PhD at UW.

Doctoral Program

The student must maintain a 3.0 cumulative GPA.

The student must teach two semesters of college mathematics.

The student must complete a combination of 72 hours of coursework and dissertation research. Within the 72 hours, a maximum of 12 hours can be at the 4000 level, and 42 hours must be formal courses at the 5000 level. The courses must be mathematics courses or

courses with significant mathematical content, as approved by the department's graduate committee.

Within the 42 hours of 5000-level courses, the student must:

- Complete MATH 5200, 5230, 5310, 5400, 5500, and 5550 with a grade of B or better.
- Take two hours of MATH 5800-02, Seminars and Colloquia.
- Complete the courses distributed in three areas: algebra, analysis, and applied mathematics. The student must take at least two courses in each of two categories and at least one course from the third category. The department maintains a list of course categories.

In addition, the student must:

- Pass the foundation exam, the qualifying exam in the student's research area, and the preliminary exam.
- Write a dissertation containing the student's original mathematical results and present an oral defense of the research.
- Take one hour of the seminar 4970: Professional Development in Mathematics and one hour of the seminar 4970: Professional Development in Teaching.

Mathematics (MATH)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀Q]).

1000. Problem Solving. 3. [QA◀Q] For students not planning to enroll in MATH 1400, 1450 or a calculus course. Examines modern topics chosen for their applicability and accessibility. Provides students with mathematical and logical skills needed to formulate, analyze and interpret quantitative arguments in a variety of settings. Introduces statistics and stresses the use of a calculator. *Note:* MATH 1000 is neither a prerequisite nor suitable preparation for MATH 1400 (College Algebra). *Prerequisite:* grade of C or better in Math 0921 or Level 2 on the Math Placement Exam or Math ACT of 21 or Math SAT of 530 or concurrent enrollment in MATH 1080.

1080. Bridge Program Math. 3. This class is to assist students in refreshing their skills in Mathematics, from the fundamentals of arithmetic through college level algebra and trigonometry. If time and preparation allow,

basic calculus concepts will be discussed. This class is largely self-paced, but with intrusive faculty support.

1100. Number and Operations for Elementary School Teachers. 3. [QA◀(none)] For prospective elementary school teachers; purpose is to prepare students to be competent in teaching the major concepts and skills related to the real number system and four arithmetic operations. Includes asking and answering critical questions about subsets of the real number system, including natural, integer, and rational numbers. *Prerequisite:* grade of C or better in MATH 0921 or Level 2 on the Math Placement Exam or Math ACT of 21 or Math SAT of 530.

1101. First-Year Seminar. 3. [(none)◀FYS]

1105. Data, Probability, and Algebra for Elementary School Teachers. 3. [QB◀Q] Continuation of MATH 1100 for prospective elementary teachers; emphasis is on asking and answering critical questions about our world through algebra, probability, and data analysis to prepare students to be competent in teaching these major concepts. Explorations focus on representing, analyzing, and generalizing patterns and the chances of future events. *Prerequisite:* grade of C or better in MATH 1100.

1123. Math, Music and Acoustics. 3. [(none)◀Q] For music majors and minors not planning to enroll in MATH 1400, 1450 or a calculus course. Serves as an introduction to the mathematics and physics underlying music and develops quantitative reasoning in a musical context. Topics include the wave nature of sound, intervals, scales, temperment, acoustics and psychoacoustics. *Note:* MATH 1123 is neither a prerequisite nor suitable preparation for MATH 1400. *Prerequisites:* grade of C or better in MATH 0921 or Level 2 on the Math Placement Exam or Math ACT of 21 or Math SAT of 530 and grade of C or better in MUSC 1030.

1400. College Algebra. 3. [QA◀Q] Emphasizes aspects of algebra important in the study of calculus. Includes notation of algebra, exponents, factoring, theory of equations, inequalities, functions, graphing and logarithms. For students who plan to enroll in a calculus course (MATH 2200 or 2350). Students receiving credit for MATH 1450 may not receive credit for this course. *Prerequisite:* grade of C or better in Math 0925 or Level 3 on the Math Placement Exam or Math ACT of 23 or Math SAT of 560.

1405. Trigonometry. 3. [QA◀Q] Emphasizes aspects of trigonometry important in the study of calculus. Interplay between trigonometric expressions and their graphs. Students are expected to use a graphing calculator in the course and on exams. See instructor for

specifications. Topics include: angle measurement, trigonometric functions, graphing, laws of sines and cosines, identities, equations, polar equations and graphs, vectors, complex numbers, DeMoivre's theorem. This course is designed for students with little or no prior knowledge of trigonometry who plan to enroll in MATH 2200. Students receiving credit for MATH 1450 may not receive credit for this course. *Prerequisite:* grade of C or better in MATH 1400 or Level 4 on the Math Placement Exam or Math ACT of 25 or Math SAT of 600.

1450. Algebra and Trigonometry. 5. [QA◀Q] Emphasizes aspects of algebra, trigonometry and problem solving important in the study of calculus. Functions and their applications to real world problems. Classes of functions including polynomial, exponential, logarithmic and trigonometric functions. Intuitive introduction to the idea of limit and sequence which are developed further in the calculus sequence. For the student with considerable prior exposure to trigonometry and algebra. Graphing calculators are used frequently in class and on assignments. See instructor for specifications. Students with both MATH 1400 and 1405 credit may not receive credit for this course. *Prerequisite:* grade of C or better in MATH 0925 or Level 3 on the Math Placement Exam or Math ACT of 23 or Math SAT of 560.

2120. Geometry and Measurement for Elementary School Teachers. 3. Continuation of MATH 1105 for prospective elementary teachers; emphasis is on asking and answering critical questions about spatial reasoning as evident in the real world. Includes investigations of two- and three-dimensional shapes and their properties, measurements, constructions, and transformations to prepare students to be competent in teaching these concepts. *Prerequisite:* grade of C or better in MATH 1105.

2200. Calculus I. 4. [QB◀Q] Emphasizes physical science applications. Includes plane analytic geometry, differentiation, applications of the derivative, differential equations, integration and applications. *Prerequisite:* grade of C or better in MATH 1405 or 1450 or Level 5 on the Math Placement Exam or Math ACT of 27 or Math SAT of 640.

2205. Calculus II. 4. [(none)◀Q] Continues MATH 2200. Includes elementary functions, derivatives, integrals, analytical geometry, infinite series and applications. *Prerequisite:* grade of C or better in MATH 2200 or Advanced Placement credit in MATH 2200.

2210. Calculus III. 4. Applies calculus to situations described by more than one variable. Includes vectors, multivariable equations and functions, parameterization of curves and

surfaces, partial derivatives, directional derivatives, the gradient, optimization methods, integration over curves and surfaces using Cartesian, polar, cylindrical, and spherical coordinates, vector fields, and Green's, Stokes's, and the Divergence Theorems. *Prerequisite:* grade of C or better in MATH 2205 or Advanced Placement credit in MATH 2205.

2250. Elementary Linear Algebra. 3. Studies linear equations and matrices, vector spaces, linear transformations, determinants, orthogonality, eigenvalues and eigenvectors. *Prerequisite:* grade of C or better in MATH 2200 or 2350.

2300. Discrete Structures. 3. Introduces the mathematical concepts that serve as foundations of computer science: logic, set theory, relations and functions, graphs (directed and undirected), inductively defined structures (lists and trees), and applications of mathematical induction. Provides an introduction to abstract and rigorous thinking in advanced mathematics and computer science. Cross listed with COSC 2300. *Prerequisite:* grade of C or better in COSC 1030 and in either MATH 2200 or 2350.

2310. Applied Differential Equations I. 3. Includes solution of ordinary differential equations, integral transforms. Emphasizes construction of mathematical models arising in physical science and other areas. *Prerequisite:* grade of C or better in MATH 2205.

2350. Business Calculus. 4. [QB◀▶Q] Primarily for students in the College of Business. Includes an introduction to limits; the definition of a derivative; derivatives and their applications; antiderivatives; definite integrals and their applications. The applications emphasize concepts of interest to business majors. *Prerequisite:* grade of C or better in MATH 1400 or Level 4 on the Math Placement Exam or Math ACT of 26 or Math SAT of 620.

2355. Mathematical Applications for Business. 4. Primarily for students in the College of Business. Includes the mathematics of finance; systems of linear equations and matrices; linear programming; sets, counting, and probability. Students will learn to use Excel spreadsheets to solve business application problems in a computer lab that meets one day per week. *Prerequisite:* grade of C or better in MATH 1400 or Level 4 on the Math Placement Exam or Math ACT of 26 or Math SAT of 620.

2800. Mathematics Major Seminar. 2. An introduction to modern mathematical reasoning and discourse, emphasizing the distinctive ways in which logic and language are used and the motivations behind them. Develops methods of precise definition and rigorous proof. Several topics are explored, illustrat-

ing mathematics as a living, dynamic subject with its own culture and conventions. Offered S/U only.

2850 [3800]. Putnam Team Seminar. 2 (Max. 8). Preparation for the William Lowell Putnam Mathematical Competition. Problem solving strategies and mathematical content appropriate for the Putnam Exam are emphasized with problem sets taken from previous Putnam or other international math contests. Offered S/U only. *Prerequisites:* MATH 2200, 2205. (Offered fall semester)

3205. Analysis I: Elementary Real Analysis. 3. An introduction to rigorous analysis in one real variable. Includes a rigorous reconsideration of the elements of calculus: the real number system, numerical sequences and series, limits, continuity, differentiability, and Riemann integrability for functions of one variable. Proof and mathematical writing are emphasized. *Prerequisites:* Grade of C or better in MATH 2205 and 2800.

3340. Introduction to Scientific Computing. 3. Introduces basic numerical methods to solve scientific and engineering problems. Topics include: code structure and algorithms, basic numerical methods for linear systems, eigenvalue problems, interpolation and data fitting, nonlinear systems, numerical differentiation and integration. Cross listed with COSC 3340. *Prerequisites:* grade of C or better in MATH 2210.

3341. Introduction to Scientific Computing Lab. 1. The objective of this lab is to expose students to the basic syntax and tools in MATLAB so that they succeed in writing correct computer code for the solution of scientific computing problems. Topics include: MATLAB syntax, variable types, code structure, function types, algorithm structure and design. Offered S/U only. *Prerequisite:* Concurrent or previous enrollment in MATH 3340.

3500. Algebra I: Introduction to Rings and Proofs. 3. Begins with common features of integers, rational numbers, and polynomials, leading to study of rings in general. Topics include divisibility, factorization, and modular arithmetic for integers and polynomials, and homomorphisms and ideals for rings. Proof techniques include direct proof, proof by contrapositive, mathematical induction, and proof by contradiction. *Prerequisites:* MATH 2800 and grade C or better in MATH 2250 or concurrent registration in MATH 2250.

3700. Combinatorics. 3. Provides an introduction to combinatorics and combinatorial algorithms, with applications to areas such as computer science and probability. Topics include general counting methods, recurrence relations, generating functions, inclusion-

exclusion, partial orders, and graph theory. *Prerequisite:* grade of C or better in Math 2250. (Offered spring semester)

4000. History of Mathematics. 3. Explores the roots of mathematics and the people who made significant contributions to it. Mathematical subjects typically include algebra, calculus and number theory; both chronological and topical approaches are employed. *Prerequisite:* grade of C or better in MATH 2205. (Offered spring semester)

4100. Mathematics in the Elementary School. 1-6 (Max. 6). Acquaints prospective or experienced teachers of mathematics with newer developments in mathematics curriculum and materials. Emphasizes mathematical basis for courses in an elementary mathematics curriculum; organization and design of mathematics programs for grades K-7; and design and construction of curriculum and/or materials to meet specific needs of the teacher or school district. *Prerequisites:* grade of C or better in MATH 1105 and consent of instructor.

4150. Secondary School on Campus. 1-4 (Max. 8). Provides prospective teachers opportunity to study mathematics as it relates to the secondary school. Topics may vary from semester to semester. Emphasizes current trends and concerns of secondary school mathematics education. *Prerequisites:* grade of C or better in MATH 2205 and concurrent with EDSE 4271. (Offered fall semester)

4200. Analysis 2: Advanced Analysis. 3. [(none)◀▶COM3] A second course in analysis. Includes metric space topology, sequences and series of functions, and analysis in \mathbb{R}^n . *Prerequisites:* grade of C or better in MATH 2210, 2250 and 3205. (Offered fall semester)

4205. Analysis 3: Undergraduate Topics in Analysis. 3. Special topics in analysis. Content varies. May be repeated for credit. *Prerequisite:* grade of C or better in MATH 4200. (Offered spring semester)

4230. Introduction to Complex Analysis. 3. Develops the theory of functions of one complex variable. Topics include the algebra and geometry of complex numbers, functions of one complex variable, elementary functions, limits, continuity and differentiation. Differentiability leads to the Cauchy theorem, integral theorems, power series, residue theory and applications to integration theory and boundary value problems. *Prerequisite:* grade of C or better in MATH 2210. (Offered spring semester)

4255 [4250]. Mathematical Theory of Probability. 3. Calculus-based. Introduces mathematical properties of random variables. Includes discrete and continuous probability distributions, independence and conditional probability, mathematical expectation, multi-

variate distributions and properties of normal probability law. Cross listed with STAT 4255.

Prerequisite: grade of C or better in MATH 2210.
4265 [4260, 4010]. Introduction to the Theory of Statistics. Presents derivations of theoretical and sampling distributions. Introduces theory of estimation and hypothesis testing. Cross listed with STAT 4265. *Prerequisite:* MATH 4255.

4300. Introduction to Mathematical Modeling. 3. A model of a real world problem captures the essential features of the problem, while scaling it down to a manageable size. In this course, symbolic tools and mathematical techniques are used to construct, analyze and interpret various mathematical models which arise from problems in the physical, biological and social sciences. *Prerequisite:* grade of C or better in MATH 2250 or 2310. (Offered fall semester)

4340. Numerical Methods for Ordinary and Partial Differential Equations. 3. Further develops the skills needed for computational problem solving and numerical analysis. Topics addressed include: one-step and linear multistep methods for solving initial value problems; truncation errors, stability analysis, and convergence of the numerical methods; finite difference approximation for elliptic equations and initial boundary value problems; iterative methods for sparse linear systems. Students typically complete a final project in this course. Cross listed with COSC 4340. *Prerequisites:* grade of C or better in MATH 2310 and MATH 3340. (Offered spring semester)

4420. Advanced Logic. 3. Studies advanced topics in mathematical logic. Takes up such topics as: uninterpreted calculi and the distinctive contributions of syntax and semantics; metatheory, including completeness and consistency proofs; modal logic and semantics; logic as a philosophical tool. Dual listed with MATH 5420; cross listed with COSC/PHIL 4420. *Prerequisite:* PHIL 3420 or equivalent.

4440. Introduction to Partial Differential Equations I. 3. Survey of analytic methods for solving partial differential equations. Topics include: method of characteristics for solving first-order linear and quasi-linear equations; classification of second-order equations and canonical forms; background to separation of variables with applications; transform methods and Green functions; elliptic equations; heat and wave equations in one dimension. *Prerequisites:* grade of C or better in MATH 2210 and MATH 2310.

4500. Matrix Theory. 3. Continuation from MATH 2250 of the study of matrices, an important tool in statistics, physics, engineering and applied mathematics in general. Concen-

trates on the structure of matrices, including diagonalizability; symmetric, hermitian and unitary matrices; and canonical forms such as Jordan form. *Prerequisite:* grade of C or better in MATH 2250. (Offered fall semester)

4510. Algebra II: Introduction to Group Theory. 3. [(none)◀COM3] An introduction to the fundamental properties of groups including: binary operations, groups, permutation groups, subgroups, homomorphisms, and quotient groups. *Prerequisite:* grade of C or better in MATH 3500. (Offered spring semester)

4520. Algebra III: Topics in Abstract Algebra. 3. Further examples and structure of rings and fields. Finite fields and number fields. Special topics. *Prerequisite:* grade of C or better in MATH 4510. (Offered fall semester)

4550. Theory of Numbers. 3. Studies topics in mathematics which are motivated by questions about integers. Topics include divisibility, congruences, diophantine equations, quadratic residues, primitive roots, primes, and representations of positive integers. *Prerequisite:* grade of C or better in MATH 3500. (Offered spring semester)

4600. Foundations of Geometry. 3. Broadens the student's understanding of the many faces of geometry and provides a context for the specific case of Euclidean geometry. Various approaches will be presented, including axiomatic, synthetic, coordinate, and transformational methods. *Prerequisite:* grade of C or better in MATH 3205 or 3500. (Offered fall semester)

4800. Seminar in Mathematics. 1-3 (Max. 6). Exposes students to problems and thinking in mathematics which would otherwise be unavailable. *Prerequisite:* consent of instructor.

4970. Professional Development in Teaching. 1-6 (Max. 6). Undergraduate student will assist in classroom and discussion section teaching under the guidance of an instructor in Mathematics. Does not count towards Mathematics degree requirements. Offered Satisfactory/Unsatisfactory only. *Prerequisite:* Consent of instructor.

5090. Topics in the Foundations of Mathematics. 1-6 (Max. 9). *Prerequisites:* MATH 3000 and consent of instructor.

5140. Numbers, Operations, and Patterns for the Middle-level Learner. 3. Provides working middle-level mathematics teachers opportunities to understand and discuss numbers, their representations, and operations on them from an abstract perspective that includes elegant proof. Also emphasized is the role of language and purpose in composing definitions. Cross listed with NASC 5140. *Prerequisites:* admission to a university graduate

program, in either degree or non-degree seeking status, and acceptance into the Middle-level Mathematics Program.

5150. Seminar in Secondary School Mathematics. 1-4 (Max. 18). Seminar in Secondary School Mathematics. *Prerequisite:* 6 hours of MATH 4150.

5160. Social and Historical Issues in Mathematics and the Middle-Level Learner. 3. Empowers teachers of middle-level mathematics to design more engaging experiences. Emphasizes the historical context for the development of mathematics, especially its symbols, tools, personalities, and classic problems. Cross listed with NASC 5160. *Prerequisites:* admission to a UW graduate program, in either degree or non-degree seeking status, and acceptance into the Middle-level Mathematics Program.

5170. Connecting Geometry with Problem-Solving for the Middle-Level Learner. 3. Showcases two aspects of 2D and 3D geometry: measurement and transformation. Emphasis reflects current state and national standards for middle-level mathematics classroom and teacher preparation, especially appropriate uses of technology, geometric tools, mathematical language, and problem-solving strategies. Cross listed with NASC 5170. *Prerequisites:* admission to a university graduate program, in either degree or non-degree seeking status, and acceptance into the Middle-level Mathematics Program.

5190. Mathematics of Change and the Middle-Level Learner. 3. Students gain a solid understanding of data and functions in the service of calculus. Course is hands-on, project-driven and focuses on the essential concepts of functions and calculus and their role in middle-level mathematics. Emphasis is on writing and technology (calculators and probeware). Cross listed with NASC 5190. *Prerequisites:* admission to a UW graduate program, in either degree or non-degree seeking status, and acceptance into the Middle-level Mathematics Program.

5200. Real Variables I. 3. Develops the theory of measures, measurable functions, integration theory, density and convergence theorems, product measures, decomposition and differentiation of measures, and elements of function analysis on L_p spaces. Lebesgue theory is an important application of this development. *Prerequisite:* MATH 4200.

5205. Real Variables II. 3. A continuation of MATH 5200. *Prerequisite:* MATH 5200.

5230. Complex Variables I. 3. Develops the function theory of holomorphic (analytic) and harmonic functions. Topics covered include the Cauchy-Riemann equations, Cauchy-Goursat theorem, Cauchy integral theorem, Morera's

theorem, maximum modulus theorem, Liouville's theorem, power series representation, harmonic functions, theory of singularities of functions of one complex variable, contour integration, analytic continuation, Riemann mapping theorem and topology of spaces of holomorphic functions. *Prerequisite:* MATH 4200.

5235. Complex Variables II. 3. A continuation of MATH 5230. *Prerequisites:* MATH 5230.

5255. Mathematical Theory of Probability. 3. Calculus-based. Introduces mathematical properties of random variables. Includes discrete and continuous probability distributions, independence, and conditional probability distributions, independence and conditional probability, mathematical expectation, multivariate distributions and properties of normal probability law. Dual listed with MATH 4255, cross listed with STAT 5255. *Prerequisites:* grade of C or better in MATH 2210 or 2355.

5265. Introduction to the Theory of Statistics. 3. Presents derivations of theoretical and sampling distributions. Introduces theory of estimation and hypothesis testing. Dual listed with MATH 4265, cross listed with STAT 5265. *Prerequisites:* STAT 4250/5250, MATH 4250.

5270. Functional Analysis I. 3. Topics include the geometry of Hilbert spaces, linear functions and operators on Hilbert spaces, spectral theory of compact normal operators, Banach space theory, the open mapping theorem, Hahn-Banach theorem, Banach-Steinhaus theorem, duality and linear operators on Banach spaces, and different topologies on Banach spaces and their duals. *Prerequisite:* MATH 5200.

5275. Functional Analysis II. 3. Topics may include discussion of topological vector spaces, locally convex spaces, F-spaces, spectral theory of non-compact operators on Hilbert spaces, semigroups or evolution operators, distribution theory, and applications to differential equations and Sobolev spaces. *Prerequisite:* MATH 5270.

5290. Topics in Analysis. 1-6 (Max. 18). Topics in analysis. *Prerequisite:* consent of the instructor.

5310. Computational Methods in Applied Sciences I. 3. First semester of a three-semester computational methods series. Review of iterative solutions of linear and nonlinear systems of equations, polynomial interpolation/approximation, numerical integration and differentiation, and basic ideas of Monte Carlo methods. Comparison of numerical techniques for programming time and space

requirements, as well as convergence and stability. Identical to COSC 5310. *Prerequisite:* MATH 3310, COSC 1010.

5340. Computational Methods II. 3. Second semester of a three-semester computational methods series with emphasis on numerical solution of differential equations. Topics include explicit and implicit methods, methods for stiff ODE problems, finite difference, finite volume, and finite element methods for time-independence PDEs semi/fully discrete methods for time-dependent PDEs. *Prerequisite:* MATH 5310.

5345. Computational Methods III. 3. Third semester of a three-semester computational methods series with emphasis on numerical solution of problems displaying sharp fronts and interfaces (nonlinear conservation laws, Hamilton-Jacobi equations). Cross listed with COSC 5345. *Prerequisite:* MATH 5340.

5390. Topics in Numerical Analysis. 1-6. (Max 18). Topics in numerical analysis. *Prerequisite:* consent of the instructor.

5400. Methods of Applied Mathematics I. 3. First semester of a one-year survey of topics and methods of applied mathematics, with emphasis on applications from physics and engineering. The full sequence includes introductions to mathematical aspects of mechanics (e.g., conservation laws), asymptotic expansions, systems of ODE and stability, integral equations and calculus of variations, PDE with boundary value problems and generalized solutions (including wave, heat, and potential equations), numerical methods and stability. *Prerequisite:* MATH 2250, 4200 or 4400, and 2310 or 4430.

5405. Methods of Applied Mathematics II. 3. A continuation of MATH 5400. *Prerequisite:* MATH 5400.

5420. Advanced Logic. 3. Studies advanced topics in mathematical logic. Takes up such topics as: uninterpreted calculi and the distinctive contributions of syntax and semantics; metatheory, including completeness and consistency proofs; modal logic and semantics; logic as a philosophical tool. Dual listed with MATH 4420; cross listed with COSC/PHIL 5420. *Prerequisite:* PHIL 3420 or equivalent; graduate standing.

5430. Ordinary Differential Equations II. 3. Differential equations constitute the mathematical language for problems of continuous change. ODEs deal with evolutionary processes involving one independent variable. This course revisits solution techniques but emphasizes the theoretical framework. Topics include: existence and uniqueness, linear and

nonlinear differential systems, asymptotics and perturbations, and stability. *Prerequisite:* MATH 4200, 4430.

5440. Partial Differential Equations II. 3. The theory of PDEs is important for abstract mathematics, applied science, and mathematical modeling. This course covers solution techniques but emphasizes the theoretical framework. Topics include: first order systems; characteristics; hyperbolic, elliptic and parabolic equations; separations of variables; series and transforms; integral relations; Green's functions, maximum principles; variational methods. *Prerequisite:* MATH 4200 and 4440.

5490. Topics in Applied Mathematics. 1-6 (Max. 18). *Prerequisite:* consent of instructor.

5500. Advanced Linear Algebra. 3. An introduction to the theory of abstract vector spaces and linear transformations from an axiomatic point of view, with applications to matrix theory. Topics include vector spaces, dimension, linear transformations, dual spaces and functionals, inner product spaces, and structure theorems. *Prerequisite:* MATH 3500 and MATH 4500.

5510. Combinatorial Theory. 3. An introduction to combinatorics covering both classical and contemporary topics. Includes some of the following: generating functions, recursion formulas, partially ordered sets, inclusion-exclusion, partitions, graph theory, Ramsey theory, combinatorial optimization, Latin squares, finite geometries, and design theory. *Prerequisite:* consent of the instructor.

5530. The Theory of Groups. 3. An in-depth study of various aspects of group theory, building on MATH 5550. Topics include some of the following: classical theory of finite groups (both Abelian and non-Abelian), infinite Abelian groups, free groups, permutation groups, group representations, endomorphism, extensions, and cohomology. *Prerequisite:* MATH 5550.

5550. Abstract Algebra I. 3. Studies the structure of groups, rings, and fields. For each, concepts of substructures, quotient structures, extensions, homomorphism, and isomorphism are discussed. *Prerequisite:* MATH 3500 or 5500.

5555. Abstract Algebra II. 3. A continuation of MATH 5550, examining in depth selected topics from the theory of rings, fields, and algebras, including Galois theory. *Prerequisite:* MATH 5550.

5570. Matrix Theory and Combinatorics. 3. An overview of matrix theory and its applications to combinatorics. Topics include Smith normal form, the Perron-Frobenius theory of non-negative matrices, location and perturbation of eigenvalues, and interlacing of eigenvalues. Applications include structure

theorems for $(0,1)$ -matrices, network flows, spectra of graphs, and the permanent. *Prerequisite:* MATH 5500.

5590. Topics in Algebra. 1-6 (Max. 18). Topics in algebra. *Prerequisites:* consent of the instructor.

5600. Point-Set Topology. 3. Topics considered are metric spaces, open spheres, open sets, closed sets, continuous functions, limit points, topological spaces, homeomorphisms, compactness, connectedness, and separability. The familiar notion of distance on the real number line is generalized to the notion of a metric for an arbitrary set, which is in turn generalized to the concept of a set topology for a set. Certain applications to analysis and geometry are indicated. *Prerequisite:* MATH 3205.

5605. Algebraic Topology. 3. Topics in algebraic topology, including simplicial homology groups and their topological invariance, the Eilenberg-Steenrod axioms, singular homology theory, and cohomology. *Prerequisite:* MATH 3500.

5640. Differential Geometry. 3. Curve theory, theory of surfaces, and geometries on a surface. *Prerequisite:* MATH 4200.

5690. Topics in Topology. 1-6 (Max. 9). *Prerequisite:* consent of instructor.

5700. Topics in Combinatorics. 1-6 (Max. 18). Selected topics in combinatorial analysis.

5800. Seminar in Mathematics. 1-3 (Max. 8). *Prerequisite:* consent of instructor.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate Program of Study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5980. Dissertation Research. 1-12 (Max. 48). Graduate level course designed for students who are involved in research for their dissertation project. Also used for students

whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate level degree program.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

Statistics

223 Ross Hall, (307) 766-4221

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Web site: www.uwyo.edu/mathstats

Program Director: Ken Gerow

Professors:

RICHARD ANDERSON-SPRECHER, B.A. Carleton College 1974; M.A. University of Minnesota 1976; Ph.D. University of Iowa 1990; Professor of Statistics 2006, 1990.

KENNETH G. GEROW, B.S. University of Guelph, Canada 1981; M.Sc. 1984; Ph.D. Cornell University 1992; Professor of Statistics 2007, 1993.

TIMOTHY J. ROBINSON, B.S. James Madison University 1989; M.S. Virginia Polytechnic Institute and State University 1994; Ph.D. 1997; Professor of Statistics 2012

SHAUN S. WULFF, B.S. Montana State University 1991; M.S. 1994; Ph.D. Oregon State University 1999; Professor of Statistics 2019, 1999.

Assistant Professors:

PAVEL CHERNYAVSKIY, Ph.D. University of Nebraska-Lincoln 2018; Assistant Professor of Statistics 2018.

ANNALISA PICCORELLI, B.A. Miami University of Ohio 2003; M.S. Case Western Reserve University 2007; Ph.D. 2010. Assistant Professor of Statistics 2015.

Assistant Lecturer:

MICHELE BIRD, B.A. University of Nevada, Las Vegas 1996; M.A. 2000; Assistant Lecturer of Statistics 2019.

Adjunct Professors:

Legg, L. McDonald, T. McDonald, Nychka, Sain

Emeriti Faculty:

Stephen L. Bieber, Burke Grandjean

The curriculum in statistics includes a firm foundation in mathematics and computer science, in addition to course work in statistical theory and methodology. Statistics majors are also required to obtain a minor in an area of application. The nature of statistical work is to design and analyze research projects through the application of the principles of mathematics, computer science, and statistics.

The student who wishes to make valid inferences from empirical data will find the field of statistics fascinating and rewarding.

The study of statistics as a separate professional field is comparatively recent. The wide demand for graduates with special training in research and development techniques has fostered development of statistical curricula in colleges and universities. A pioneer in this field, the University of Wyoming is one of the few schools in the nation where a coordinated undergraduate training program in statistics is available.

We expect that students graduating with a statistics degree will be able to: 1) recognize the importance of variation and uncertainty in the world, 2) understand how statistics improves decisions when faced with uncertainty, 3) become proficient with a broad range of statistical tools, 4) develop critical thinking skills that enable application of statistics in new and unusual settings, and 5) communicate effectively. With these skills, graduates will be able to work effectively as statistical professionals and, if desired, successfully pursue further training at the master's and doctorate levels.

Graduates with statistical training are employed in a broad spectrum of areas which include the business world, the sciences (social, biological, physical and health), as well as engineering and education. For this reason, an area of application is required of each student.

The statistics program also offers graduate programs leading to a minor in statistics, and to a Master of Science (Plan A, Plan B), and Doctor of Philosophy in statistics.

Undergraduate Major

In addition to university and college requirements, requirements for statistics majors include:

A. Statistics	at least 30
2010/2050/2070/4220	3-4
2110/3050/5050/5060/5070/5080	3
4015, 4025, 4255, 4265	12
Optional from 4045, 4070, 4115, 4155, 4300, 4350, 4360, 4370, 4460, 4880, 5320	9
Senior thesis 4870.....	3
B. Mathematics 2200, 2205, 2210, 2250.....	15
C. Computer science 1010 and 1030.....	6
D. Electives—chosen so that at least 42 hours are at the 3000/4000/5000 level	

Total hours: at least 120

Only grades of C or better will be accepted for the major.

Typical Freshman Year for Statistics Majors

Freshman Year: Fall

ECON 1010.....	3
ENGL 1010.....	3
MATH 2200.....	4
POLS 1000.....	3
Biological, physical or earth science.....	4
Physical Activity and Health requirement	1

Total Hrs. 18

Freshman Year: Spring

ECON 1020.....	3
University Studies.....	3
MATH 2205.....	4
STAT 2010/2050/2070/4220.....	3-4
Biological, physical, or earth science.....	4

Total Hrs. 17-18

Note: For several entry level courses such as STAT 2010, 2050, 2070 and 4220, a student cannot receive credit for more than one of these courses. The same is true for the second courses 2110, 3050 and 5050, 5060, 5070, 5080.

Statistics Minor

The following courses are required for a statistics minor:

MATH 1400.....	3
STAT 2010/2050/2070/4220.....	3-4
STAT 3050.....	3

And 9 additional hours from the following:

STAT 4015.....	3
STAT 4025.....	3
STAT 4045.....	3
STAT 4070.....	3
STAT 4115.....	3
STAT 4155.....	3
STAT 4255.....	3
STAT 4265.....	3
STAT 4350.....	3
STAT 4360.....	3
STAT 4370.....	3
STAT 4300.....	3
STAT 5320.....	3

Total Hrs. 18-19

Only grades of C or better will be accepted for the minor.

Graduate Study

The Statistics Program offers graduate programs leading to a minor in statistics, to a master of science in applied statistics (Plan B Option 1), and to a doctor of philosophy in statistics. Students wishing to pursue a master of science in statistics with a thesis option (Plan A), should contact the department directly. The minor is designed to enhance the M.S. or Ph.D. program of any student

enrolled in one of the graduate programs at the University of Wyoming. All of these programs emphasize the understanding and application of a broad variety of statistical methods on real projects. Students will be provided with numerous opportunities to perform analyses and communicate findings. The M.S. and Ph.D. programs in statistics are grounded in statistical theory.

Program Specific Admission Requirements

The prerequisite for admission to graduate study is an undergraduate degree from an accredited institution, including work in mathematics through calculus III, Linear Algebra and at least one second-level class in statistical methods. Prospective students are encouraged to have had Math Analysis and upper level introduction to probability and mathematical statistics. A score of at least 150 on the verbal reasoning section and a score of at least 141 on the quantitative reasoning section is required for the Master's Degree and the TOEFL exam is required for international students. The minimum score for the TOEFL is 540 (76 Internet-based Test) or for IELTS minimum score is 6.5. Students who do not have prerequisites in mathematics and statistics may make up this deficiency at the beginning of their graduate program; however, such work does not count toward graduation requirements.

Program Specific Degree Requirements

Minor

Twelve hours at the 4000 or 5000 level with the exception of STAT 4220, 5000, and 5185.

Master's Program

Plan B (Option 1)

Master of Science in Applied Statistics

Profile

The Master's Program in Applied Statistics will give the student an extensive and broad background in statistical methods, data analysis, and written and oral presentation skills. This degree is a terminal experience in graduate statistical education and should not be viewed as preparatory for entrance into a Ph.D. program in statistics. Graduates will have the necessary background to work as data management specialists, statistical analysts, and as project managers within a wide range of research organizations.

Coursework

In addition to the general requirements of the university all candidates for the MS (Plan B – Option 1) degree must successfully take and complete:

Required: 15 credit hours

- STAT 5210 Advanced Regression
- STAT 5220 Advanced Design
- STAT 5470 Data Analysis
- STAT 5380 Bayesian Data Analysis
- STAT 53XX Computational Methods

Electives: a minimum of 15 credit hours in other acceptable graduate courses. Acceptable courses include statistics courses numbered 5000 or higher, excepting 5000, 5050, 5060, 5070, 5080, and 5185. No more than 6 credits can come from STAT 5255, 5265, 5155, and 5025.

Total: 30 credit hours

Graduation Requirements: (1) successful completion of coursework and (2) a data analysis project (Plan B paper).

Doctoral Program

Program for a Doctor of Philosophy in Statistics

Profile

The Ph.D. Program in Statistics will give the student a solid background in statistical theory and in statistical methods, in technical reading and writing skills, and in conducting independent research. Most graduates from our doctoral program have been employed as tenure-track faculty at other universities. They also have the necessary background to work as lead researchers in industrial and research organizations.

Coursework

In addition to the general requirements of the Graduate School all candidates for the Ph.D. degree must successfully take and complete:

Prerequisites for the Required Courses

- STAT 5255 Theory of Probability
- STAT 5265 Theory of Statistics
- MATH 4200 Analysis 2: Advanced Analysis (or Analysis for Statisticians Topics Course)
- STAT 5025 Design and Analysis of Experiments
- STAT 5015 Regression Analysis

Required: 45 credit hours

- STAT 5210 Statistical Methods 1
- STAT 5220 Statistical Methods 2
- STAT 5230 Statistical Methods 3
- STAT 5380 Bayesian Data Analysis
- STAT 5470 Data Analysis

STAT 5510 Distribution Theory
 STAT 5520 Inference I
 STAT 5530 Inference II
 STAT 5540 Large Sample Theory
 STAT 5620 Theory of Linear Models
 STAT 5660 Computational Statistics
 STAT 5810 Seminar (3 hours; 3 presentations)

Methodological Topics - at least **2** of the following which are **required** when offered

STAT 5615 Advanced Time Series
 STAT 5630 Multivariate Analysis
 STAT 5650 Advanced Sampling
 STAT 5670 Mixed Models

The remaining hours of doctoral work are typically filled in part by other graduate level statistics/mathematics courses/Dissertation Research. Students who enter the program lacking a course in Mathematical Analysis or the equivalent should take MATH 4200 in their first year. MATH 4200 may be counted as part of the doctoral degree program.

Graduation Requirements

1) At the end of the first year in the doctoral program each student must take a comprehensive qualifying examination. If needed a student may retake this examination. A passing grade on this examination is mandatory for continuance in the doctoral program. 2) After completing this examination a student with the assistance of her/his adviser will be expected to form a doctoral committee. This committee will determine which courses are to be included in the Graduate Level Statistics electives, and will set the conditions of and conduct the preliminary examination. A passing grade on this examination is mandatory for official admittance into the doctoral program. 3) The student must write and successfully defend a dissertation research project. The specific conditions of the dissertation project are to be determined by each student's doctoral committee, but should consist of original research suitable for publication.

Statistics (STAT)

A computerized prerequisite check is run prior to the start of the fall and spring semesters. Students who are pre-registered for a 2000-level STAT course but have not satisfied the prerequisites at the time of the check will be automatically dropped from the course.

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀Q]).

1101. First-Year Seminar. 3. [(none)◀FYS]

2000. Statistics and the World. 3. [QB◀Q]

Discusses statistical reasoning and methods as related to today's society. Emphasizes ideas rather than specific techniques. Focuses on real examples of the use (and misuse) of statistics. Includes sampling, experimentation, descriptive statistics, elementary probability and statistical inference. *Prerequisite:* grade of C or better in MATH 0921 or level 2 on the Math Placement Exam or Math ACT of 21 or Math SAT of 530 or concurrent enrollment in MATH 1080.

2050. Fundamentals of Statistics. 4. [QB◀Q]

Presents central ideas and fundamental techniques of statistical inference on applications in the biological sciences. Includes probability models and inferences for means, variances and parameters of discrete distributions. Introduces statistical computer packages in biweekly labs. Credit cannot be earned in more than one of the following courses: STAT 2010, 2050, 2070, 4220 and 5000. *Prerequisite:* grade of C or better in MATH 1000, 1400, or equivalent.

2070. Introductory Statistics for the Social Sciences. 4. [QB◀Q]

Presents central ideas of descriptive statistics and statistical inference, as applied to questions in social sciences. Includes graphs, averages, sampling, estimation, hypothesis-testing and relationships between variables. Introduces associated computer skills. Credit cannot be earned in more than one of STAT 2010, 2050, 2070, 4220, 5000. Cross listed with SOC 2070. *Prerequisite:* grade of C or better in MATH 1000, 1400, or equivalent.

2010. Statistical Methods for Business and Management Science. 3.

Provides majors in various departments of the College of Business with training in use of statistical analysis techniques as they apply to business problems. Credit cannot be earned in more than one of the following: STAT 2010, 3050 and 5050, 5060, 5070, 5080. *Prerequisite:* STAT 2010.

3050. Statistical Methods - General. 3.

Provides undergraduate majors in the Colleges of Arts and Sciences, Agriculture and Education with training in statistical methodology for multiple variable situations. Integrates computer analysis packages such as R MINITAB, SAS and SPSSX into statistical topics. Credit cannot be earned in more than one of the following courses: STAT 2110, 3050 and 5050, 5060, 5070, 5080. *Prerequisite:* STAT 2050, 2070 or equivalent.

4015 [4010, 4410]. Regression Analysis. 3.

Contains standard topics, as well as some newer and more unconventional ones. Oriented towards analysts who use computer packages

for problem solutions. Includes balance of application and theory. Dual listed with STAT 5015. *Prerequisite:* STAT 3050 or equivalent.

4025 [4020, 4310]. Design and Analysis of Experiments I. 3.

Reviews design and analysis of one-factor experiments and introduces multifactor experiments, Latin squares, nested designs and random effects. Includes topics such as polynomial response curves, trend analysis, split plots and incomplete blocks as time permits. Dual listed with STAT 5025. *Prerequisite:* choice of STAT 3050 or equivalent.

4045 [4040]. Categorical Data Analysis. 3.

Applied methods for analyzing associations when some or all variables are measured in discrete categories, not continuous scales. Topics include the binomial, multinomial, and Poisson probability models, parameter estimation and hypothesis-testing about proportions, measures of association and tests for contingency tables, logistic regression, and log-linear models. Dual listed with STAT 5045. *Prerequisite:* STAT 2110, 3050, 5050, 5060, 5070 or 5080.

4070. Causal Models. 3.

Applications of least-squares and iterative maximum-likelihood methods for drawing cause and effect conclusions from nonexperimental data. Topics include regression-based path analysis, reciprocal causation, confirmatory factor analysis, measurement error, and structural equation models with unmeasured (latent) variables. Cross listed with SOC 4070. *Prerequisite:* one of STAT 3050, 4015, 5050, 5060, 5070, 5080 or equivalent (regression methods).

4115 [4110]. Time Series Analysis and Forecasting. 3.

An applied introduction to time series and forecasting. Brief coverage of time series regression, decomposition methods, and smoothing will lead into a more detailed coverage of Box-Jenkins (ARIMA) modeling. Computer analyses using MINITAB and SAS will be an important part of the course. Cross listed with ECON 4115; dual listed with STAT 5115. *Prerequisites:* STAT 3050 or equivalent; STAT 4015/5015 recommended.

4155 [4150]. Fundamentals of Sampling. 3.

Develops methodology of simple random sampling, stratified sampling, and multistage sampling. Provides applications related to physical, social, and biological sciences. Discusses single and two-variable estimation techniques. Presents estimation based on subsamples from subpopulations. Dual listed with STAT 5155. *Prerequisite:* choice of STAT 2010, 2050, 2070 or equivalent.

4220 [4020]. Basic Engineering Statistics. 3.

Introduces probability models, properties of distributions, statistical inference and development of statistical models for physical and en-

engineering sciences. Credit cannot be earned in more than one of the following courses: STAT 2010, 2050, 2070, 4220 and 5000. *Prerequisite:* MATH 2205, 2355 or equivalent.

4240. Data Mining. 3. An introduction to statistical learning and data mining using techniques that have proven useful in recognizing patterns and making predictions. These techniques include both parametric and nonparametric models. Tools for computing and evaluating these techniques will also be studied. Dual listed with STAT 5240. *Prerequisite:* STAT 4015.

4255 [4250]. Mathematical Theory of Probability. 3. Calculus-based. Introduces mathematical properties of random variables. Includes discrete and continuous probability distributions, independence and conditional probability, mathematical expectation, multivariate distributions and properties of normal probability law. Dual listed with STAT 5255; cross listed with MATH 4255. *Prerequisite:* grade of C or better in MATH 2210. (Offered fall semester)

4265 [4260, 4010]. Introduction to the Theory of Statistics. 3. Presents derivations of theoretical and sampling distributions. Introduces theory of estimation and hypothesis testing. Dual listed with STAT 5265; cross listed with MATH 4265. *Prerequisite:* STAT/MATH 4255.

4270. Applied Bayesian Statistics. 3. This course introduces Bayesian data analysis in an applied context. We will learn about Bayesian statistics primarily in a regression model context, taken broadly. A conceptual understanding of popular Markov Chain Monte Carlo algorithms will be provided. Dual listed with STAT 5270. *Prerequisite:* STAT 3050. STAT 4015/5015 recommended.

4280. Models for Hierarchical Data. 3. Provides an introduction to the modeling and analysis of correlated/hierarchical data from exponential family member distributions (i.e. presence/absence, count data, Gaussian data). Emphasis is on applications. Aimed to build off of a first course in regression analysis. Dual listed with STAT 5280. *Prerequisite:* STAT 4015.

4300. Applied Multivariate Analysis. 3. The application of multivariate statistical methods in behavioral science research. Topics include: multivariate regression, canonical correlation, discriminate analysis, factor analysis and multidimensional scaling. A wide range of computer assistance is incorporated. Dual listed with STAT 5300. *Prerequisite:* STAT 3050 or equivalent.

4350. Survey Construction and Analysis. 3. Examines the issues surrounding the construction (item wording, test theory, and

numerical scales), assessment (sampling and psychometrics), and analysis (item analysis, qualitative data analysis, and factor analysis) of survey instruments. Roughly a third of the course is devoted to each of these areas. Dual listed with STAT 5350. *Prerequisite:* STAT 3050.

4360. Spatial Statistics. 3. Emphasis is on a generalized linear model approach to the modeling of continuous data, placing model building and the various kriging methods into a single conceptual framework. Dual listed with STAT 5360. *Prerequisite:* STAT 4015.

4370. Survival Analysis. 3. Introduction to the modeling of time to event data as it arises in epidemiological and medical research. Topics include parametric and non-parametric estimation for censored data without covariates, and for data with covariates, the proportional hazards regression model, additive hazards regression model and parametric regression models. Dual listed with STAT 5370. *Prerequisites:* STAT 4015 and 4025.

4460. Statistical Software [5480]. 1. An introduction to the various statistical software programs currently in use at the University of Wyoming. Topics will include the structure of each language, I/O, programming the basic statistical applications, and a comparison of the other languages. *Prerequisite:* 9 hours in statistics beyond introductory.

4870. Senior Thesis. 3. Encompasses senior thesis research project under faculty member guidance and supervision. Faculty sponsorship must be obtained prior to registration. *Prerequisites:* 18 hours in statistics and senior standing.

4880 [4790]. Problems in Statistics. 1-4 (Max. 9). Encourages individual initiative on part of students who work on extending their knowledge through library research. *Prerequisites:* senior standing, 8 hours in statistics and consent of instructor.

5015. Regression Analysis. 3. Contains standard topics, as well as some newer and more unconventional ones. Oriented towards analysts who use computer packages for problem solutions. Includes balance of application and theory. Dual listed with STAT 4015. *Prerequisite:* STAT 3050 or equivalent.

5025. Design and Analysis of Experiments I. 3. Reviews design and analysis of one-factor experiments and introduces multifactor experiments, Latin squares, nested designs, and random effects. Includes topics such as polynomial response curves, trend analysis, split plots and incomplete blocks as time permits. Dual listed with STAT 4025. *Prerequisite:* STAT 3050 or equivalent.

5045. Categorical Data Analysis. 3. Applied methods for analyzing associations when some or all variables are measured in discrete

categories, not continuous scales. Topics include the binomial, multinomial, and Poisson probability models, parameter estimation and hypothesis-testing about proportions, measures of association and tests for contingency tables, logistic regression, and log-linear models. Dual listed with STAT 4045. *Prerequisite:* two courses in statistics.

5050. Statistical Methods for the Biological Science. 3. General statistical analyses and their application to the biological and behavioral sciences. Analysis of variance, regression and correlation methods are studied from a data analytic perspective, emphasizing the conceptual understanding of where and when these techniques should be used and the interpretation of their results. Available computer programs will be utilized. Credit cannot be earned in more than one of the following courses: STAT 3050, 5050, 5060, 5070. Cross listed with ZOO 5050. *Prerequisite:* one course in statistics (all introductory courses except 2000).

5055. Statistical Methods for the Biological Sciences II. 3. The statistical toolkit (regression and ANOVA-driven) of methods applicable to the biological and behavioral sciences will be extended to include multiple logistic regression, power and sample size considerations, and computer-intensive methods such as bootstrapping and randomization tests, which will considerably expand the repertoire of methods that a person could use. *Prerequisite:* STAT 5050 or equivalent.

5070. Statistical Methods for the Social Sciences. 3. General statistical analyses and their application to the social sciences. Analysis of variance, regression and correlation methods are studied from a data analytic perspective, emphasizing the conceptual understanding of where and when these techniques should be used and the interpretation of their results. Available computer programs will be utilized. Credit cannot be earned in more than one of the following courses: STAT 2110, 3050, 5050, 5060, 5070. Cross listed with SOC 5070. *Prerequisite:* one course in statistics (all introductory courses except STAT 2000).

5080. Statistical Methods for the Agricultural and Natural Resource Sciences. 3. Brief review of statistical principles. Use of SAS programming. Numerous analysis of variance techniques along with commonly-used experimental designs. Multiple mean comparison, linear contrasts, power of F test, simple linear regression, polynomial regression, analysis of covariance, and some categorical data techniques for students in the agriculture and natural resources sciences. Credit cannot be earned in more than one of the following

courses: STAT 2110, 3050, 5050, 5060, 5070, 5080. Cross listed with ENTO 5080. *Prerequisite:* STAT 2050 or equivalent.

5115. Time Series Analysis and Forecasting. 3. An applied introduction to time series and forecasting. Brief coverage of time series regression, decomposition methods, and smoothing will lead into a more detailed coverage of Box-Jenkins (ARIMA) modeling. Computer analysis using MINITAB and SAS will be an important part of the course. Dual listed with STAT 4115; cross listed with ECON 5115. *Prerequisites:* STAT 3050 or equivalent; STAT 4015/5015 recommended.

5155. Fundamentals of Sampling. 3. Develops methodology of simple random sampling, stratified sampling, and multistage samples. Provides applications related to physical, social, and biological sciences. Discusses single and two-variable estimation techniques. Presents estimation based on subsamples from subpopulations. Dual listed with STAT 4155. *Prerequisite:* STAT 2070 or equivalent.

5185. Analysis of Data. 3. Focuses on data collection, analysis, interpretation, and communication, using contexts relevant to everyday situations. Topics chosen integrate well with the concerns of middle-level teachers and connect with such curriculum areas as health, science, and social studies. This course is not a research methods course. Cross listed with NASC 5180. *Prerequisites:* graduate standing in either degree or non-degree seeking status, and acceptance into the Middle-level mathematics program.

5210. Advanced Regression. 3. Advanced methodologies, with particular focus on concepts and methods related to regression. Topics include generalized linear models, nonlinear regression, elementary linear model theory, and Data Science topics such as resampling inference, ridge regression and the lasso, and k-fold cross-validation. *Prerequisites:* MATH/STAT 4265/5265 and STAT 4015/5015. STAT 4025/5025 and STAT 4045/5045 are recommended.

5220. Advanced Design. 3. Advanced study of experimental designs, observational designs, and mixed models. Topics include fixed and random effects, factorial, split-plot and repeated measures designs, and hierarchical models. Linear model methodology and Data Science concepts will also be emphasized. *Prerequisites:* MATH/STAT 4265/5265, and at least one of STAT 4015/5015, STAT 4025/5025, or STAT 5210.

5230. Statistic Methods III. 4. Continuation of topics in Statistical Methods from 5220; aimed at preparing students for advanced topics courses in Statistics. *Prerequisites:* STAT 5220 and 5520.

5240. Data Mining. 3. An introduction to statistical learning and data mining using techniques that have proven useful in recognizing patterns and making predictions. These techniques include both parametric and nonparametric models. Tools for computing and evaluating these techniques will also be studied. Dual listed with STAT 4240. *Prerequisite:* STAT 5015.

5255. Mathematical Theory of Probability. 3. Calculus-based. Introduces mathematical properties of random variables. Includes discrete and continuous probability distributions, independence and conditional probability distributions, independence and conditional probability, mathematical expectation, multivariate distributions and properties of normal probability law. Dual listed with STAT 4255; cross listed with MATH 5255. *Prerequisite:* grade of C or better in MATH 2210 or 2355.

5265. Introduction to the Theory of Statistics. 3. Presents derivations of theoretical and sampling distributions. Introduces theory of estimation and hypothesis testing. Dual listed with STAT 4265; cross listed with MATH 5265. *Prerequisites:* STAT 4255/5255.

5270. Applied Bayesian Statistics. 3. This course introduces Bayesian data analysis in an applied context. We will learn about Bayesian statistics primarily in a regression model context, taken broadly. A conceptual understanding of popular Markov Chain Monte Carlo algorithms will be provided. Dual listed with STAT 4270. *Prerequisite:* STAT 3050. STAT 4015/5015 recommended.

5280. Models for Hierarchical Data. 3. Provides an introduction to the modeling and analysis of correlated/hierarchical data from exponential family member distributions (i.e. presence/absence, count data, Gaussian data). Emphasis is on applications. Aimed to build off of a first course in regression analysis. Dual listed with STAT 4280. *Prerequisite:* STAT 5015.

5300. Applied Multivariate Analysis. 3. The application of multivariate statistical methods in behavioral science research. Topics include: multivariate regression, canonical correlation, discriminate analysis, factor analysis and multivariate regression, canonical correlation, discriminate analysis, factor analysis and multidimensional scaling. A wide range of computer assistance is incorporated. Dual listed with STAT 4300. *Prerequisite:* STAT 5050, 5060, 5070, 5080.

5350. Survey Construction and Analysis. 3. Examines the issues surrounding the construction (item wording, test theory, and numerical scales), assessment (sampling and psychometrics), and analysis (item analysis, qualitative data analysis, and factor analysis) of survey instruments. Roughly a third of the course is devoted to each of these areas. Dual listed with STAT 4350. *Prerequisite:* STAT 3050.

5360. Spatial Statistics. 3. Emphasis is on a generalized linear model approach to the modeling of continuous data, placing model building and the various kriging methods into a single conceptual framework. Dual listed with STAT 4360. *Prerequisite:* STAT 4015.

5370. Survival Analysis. 3. Introduction to the modeling of time to event data as it arises in epidemiological and medical research. Topics include parametric and non-parametric estimation for censored data without covariates, and for data with covariates, the proportional hazards regression model, additive hazards regression model and parametric regression models. Dual listed with STAT 4370. *Prerequisites:* STAT 4015, 4025 and 4265.

5380. Bayesian Data Analysis. 3. Bayesian statistical methods for analyzing various kinds of data. Topics include basic Bayesian ideas and model formulation (priors, posteriors, likelihoods), single- and multiple-parameter models, hierarchical models, generalized linear models, multivariate models, survival models and an introduction to computation methods. *Prerequisites:* at least 2 semesters of calculus and one semester of statistics at or beyond the 4000 level.

5470. Data Analysis. 3. This course is designed to develop the skill of analyzing data sets using methods of classic statistical analysis, such as analysis of variance, regression, discrete models, descriptive analysis, non-parametrics, and multivariate methods. The focus will be on understanding the various models and methods, computer assisted data analysis, and communication of results (oral and written). *Prerequisite:* 12 graduate level hours in statistics (excluding STAT 5000).

5490. Statistical Consulting. 1. An introduction to the art and practice of statistical consulting. Topics include active listening, ascertaining client knowledge level and ability, determining appropriate methods of analysis given limitations, and organizing and managing a consulting session. *Prerequisite:* graduate standing in statistics, 15 hours in statistics.

5510. Distribution Theory. 4. Topics covered include probability theory, conditional probability, random variables, special distribution functions, functions of random variables,

expectation, random samples, and limiting distributions. *Prerequisite:* MATH 2210, 3000 or MATH/STAT 4265.

5520. Inference I. 4. Topics covered include Properties of a random sample, Sufficiency principle, Likelihood principle, point estimation (mle, mom, Bayes estimators, etc. and methods for evaluating estimators), some interval estimation. *Prerequisite:* STAT 5510.

5530. Inference II. 3. Topics covered include methods used in Bayesian, Likelihood, Frequentist inference; some methods for robust inference and some large sample theory as needed. *Prerequisite:* STAT 5520.

5540. Large Sample Theory. 3. Treats various limiting techniques which can be used to predict the behavior of statistics computed from large data sets. The characteristic function is used in deriving the law of large numbers and various forms of the central limit theorem, including the multivariate normal case. The central and noncentral chi-square distributions are derived as the probability law for certain statistics in the limit. Other topics discussed include modes of probabilistic convergence, speed of convergence, and large sample approximation procedures. *Prerequisite:* STAT 5510.

5615. Time Series Analysis II. 3. A treatment of theory and application of ARIMA modeling of times series. Frequency domain analysis is also introduced. Additional topics will be selected from intervention analysis, transfer function (ARMAX) models, outlier analysis, vector ARIMA models, ARCH, GARCH, and state-space models, according to the interests and abilities of the class. *Prerequisites:* STAT 4015/5015, 4115 and 4265/5265.

5620. Theory of Linear Models. 3. A theoretical approach to estimation and testing in the general linear model. Topics include: special linear algebra results for statistics, parameterizations, estimability, least squares, best linear unbiased estimation, and testing linear hypotheses. *Prerequisite:* STAT 5630, 5520, MATH 4500.

5630. Multivariate Analysis. 3. The subject matter includes derivation of multi-variate normal distributions, the Wishart, and related sampling distributions, multivariate estimation, confidence regions, and hypothesis testing are covered including topics as Hotelling's T squared, profile analysis, discriminate analysis, factor analysis, and cluster analysis. *Prerequisite:* STAT 4265, MATH 2250.

5650. Theory of Sampling. 3. Consists of the theory of simple random sampling, stratified sampling, multistage sampling, and regression

and ratio estimation. Recent developments in sampling are presented. *Prerequisite:* STAT 4265, STAT 4155/5155.

5660. Computationally Intensive Methods in Statistics. 3. Advanced statistical inference often relies on methods which are computationally intensive. The basic methods include Newton-Raphson; the EM algorithm; bootstrap and other resampling procedures; kernel density estimators; Laplace's method, importance sampling and MCMC, and saddlepoint and Edgeworth approximations. *Prerequisite:* STAT 5520.

5670. Mixed Models. 3. An advanced treatment of models with fixed and random effects. Topics include: model definitions, least-squares, analysis of variance techniques, likelihood procedures, and computational applications. *Prerequisite:* STAT 5620.

5680. Advanced Bayesian Statistics. 3. Philosophical principles underlying Bayesian and non-Bayesian statistics. Decision theoretic foundations of Bayesian statistics including loss functions, minimaxity, and admissibility. Construction of conjugate prior distributions and non-informative prior distributions. Bayesian point estimation, hypothesis tests and credible sets. Computational tools for Bayesian problems including Markov chain Monte Carlo (McMC) and other methods for approximating posterior distributions with some emphasis on implementation via a programming language or statistical computing software. As time and interest permit: the normal linear model, non-normal models, hierarchical models, Bayesian model averaging, other topics. *Prerequisites:* STAT 5380; 5420 and 5520.

5810. Seminar. 1-2 (Max. 4). Research results are presented by statistics majors. (Faculty also present papers). *Prerequisite:* graduate status in statistics.

5820. Teaching of Statistics. 1 - 2. (Max 2). The following topics are presented and discussed: traditional and innovative teaching methods, assessment methods, the purpose of lectures and laboratories, in-class activities, projects, mathematics versus statistics, computer assistance, math anxiety, and group and one-on-one interaction guidelines. *Prerequisite:* consent of instructor.

5880. Advanced Problems. 1-8 (Max. 8). Intended to develop the graduate student's ability to expand his theoretical knowledge by using library materials and working under close supervision of a faculty member who is an expert in the area of study. *Prerequisite:* 12 hours in statistics and consent of instructor.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5980. Dissertation Research. 1-12 (Max. 48). Graduate level course designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate level degree program.

5990. Internship. 1-12 (Max 24). *Prerequisite:* graduate standing.

Music

2049 Buchanan Center for the Performing Arts, (307) 766-5242

FAX: (307) 766-5326

Web site: www.uwyo.edu/music

Department Head: J. Scott Turpen

Professors:

ROBERT BELSER, B.M.E. Central Missouri State University 1977; M.S. M.E University of Illinois 1982; D.M.A. University of Iowa 1994; Professor of Music 2008, 1995. Director of Bands, Conducting, Music Education.

THERESA L. BOGARD, B.M. University of Colorado 1983; M.M. Eastman School of Music 1985; D.M.A. University of Colorado 1990; Professor of Music 2004, 1992. Keyboard, Keyboard Area Coordinator, Piano.

JOHN FADIAL, B.M. North Carolina School of the Arts 1987; M.M. Eastman School of Music 1989; D.M.A. University of Maryland 1995; Professor of Music 2015, 2008. Violin.

ANNE GUZZO, B.M. University of New Mexico 1992; M.A. University of California, Santa Cruz 1996; Ph.D. University of California, Davis 2002; Associate Professor of Music 2011, 2006. Composition, Theory.

MICHAEL GRIFFITH, B.M.E. Michigan State University 1973; M.M. 1975; D.M.A. University of Colorado 1994; Professor of Music 2001, 1989. Conducting, Woodwinds.

JAMES PRZYGOCKI, B.M. Western Michigan University 1979; M.M. Indiana University 1984; Professor of Music 2005, 1993. Viola, String Methods, Music Education.

J. SCOTT TURPEN, B.M.E. Boise State University 1994; M.M. University of Georgia 1996; D.M.A. 1999; Professor of Music 2012, 2001. Saxophone.

KATRINA ZOOK, B.M. Oberlin College 1986; M.M. University of California—Santa Barbara 1992; D.M.A. Eastman School of Music 2000; Professor of Music 2011, 1999. Voice, Vocal Pedagogy, Music History, Associate Chair.

Associate Professors:

HOLLY DALRYMPLE, BM, Texas State University; MM, University of Texas-Austin; DMA, University of North Texas; Associate Professor of Music 2019, 2013. Choral Music Education.

BLAKE MCGEE, B.M. University of Minnesota 2001; M.M. 2004; D.M.A. University of Oregon 2008; Associate Professor of Music 2016, 2010. Clarinet, Musicology.

CRYSTAL SIEGER, B.M. Ohio State University 1992; M.M. University of Arizona 1994; Ph.D. 2012; Assistant Professor of Music 2014. Music Education.

BETH VANDERBORGH, B.M. Manhattan School of Music 1988; M.M. Eastman School of Music 1990; D.M.A. University of Maryland 1995; Associate Professor of Music 2014, 2008. Cello, Graduate Coordinator.

CHI-CHEN WU, B.F.A. National Taiwan Normal University 1998; M.M. 2202; D.M.A. New England Conservatory 2006; Assistant Professor of Music 2012. Piano and Collaborative Piano.

Assistant Professors:

JOSEPH CARVER, BME 2007 Ohio University; MM 2014 Ohio University; Ph.D. 2019 The Ohio State University.

BEN MARKLEY, B.M. Fort Hays State University 2005; M.A. New York University 2007; D.M.A. University of Colorado-Boulder 2010; Assistant Professor of Music 2016. Jazz Studies.

TIGER ROBISON, B.M.E. University of Hartford 2005; M.S. Central Connecticut State University 2012; Ph.D. University of Hartford 2016; Assistant Professor of Music 2017. Music Education.

DAVID WHARTON, BM Oberlin Conservatory 2009, MM Yale School of Music 2011, DMA University of Connecticut 2019. Assistant Professor of Music.

ANDREW WHEELOCK, B.M.E. Central Michigan University 2013; M.M. University of Illinois 2015; D.M.A. 2018; Assistant Professor of Music 2018. Percussion.

Academic Professional Lecturers:

SHERRY SINIFT, B.M. Western Michigan University 1979; M.M. Indiana University 1981; Academic Professional Lecturer 2010. Violin, UW String Project.

JENNIFER TURPEN, B.M.E. SUNY-Potsdam 1996; M.M. University of Georgia 2000; D.M.A. 2000; Academic Professional Lecturer, Senior 2017, 2003. Theory, Saxophone.

Lecturers:

Boddicker, Chang, Murray, Riner

Part-time Lecturers:

Fourt, Harvey, Hoffman, Latchininsky, Smith, Strampe, Stucki, Teppa, Uno-Jack, Watt

Professors Emeriti:

Steve Barnhart, David Brinkman, Gordon Childs, Julia Combs, Rodney Garnett, Frederick Gersten, Brian Hanly, Larry Hensel, Edgar Lewis, Kathleen McKeage, William Stacy, Carlyle Weiss

The Department of Music offers undergraduate and graduate degree programs which combine scholarship with performance, theory with practice and the academic with the creative. It also provides an opportunity for the study and performance of music by university students who are not majors in music. By giving concerts, workshops and lectures throughout the state of Wyoming through the Fine Arts Outreach Program, the music department serves as a musical resource for the entire state. The music department is fully accredited by the National Association of Schools of Music.

Procedures and requirements are listed in the music department *Student Handbook* which is available online at www.uwyo.edu/music/forms/index.html. The music department *Student Handbook* and the *University Catalog* are binding documents for the degree programs listed below. Students must receive a “C” or better in all courses designated MUSC to satisfy department requirements. The foreign language requirement for the Bachelor of Music in Performance Vocal Emphasis degree may be satisfied with a “C” or better in all courses. A student’s transfer courses must meet all of these requirements to be accepted for credit.

An audition is required to become a Music major or minor. The 3 Steps to Becoming a Music Major are:

1. Apply for admission to the University of Wyoming (www.uwyo.edu/admissions/).
2. Audition for admittance as a Music major and for Music scholarships. Audition and scholarship information may be found at

www.uwyo.edu/music. All Music majors and minors MUST audition to be admitted to the Music program.

3. Perform at an acceptable level, and you are in!

Degrees

Bachelor of Arts (with major in music):

A program designed for the student who desires a broadly-based liberal arts program.

Bachelor of Music Performance: A four-year course of study designed for students who wish to prepare for a professional career as performer and applied teacher.

Bachelor of Music Education: A four-year course of study for the student who wishes to prepare for a career as a teacher of music in elementary or secondary schools in the instrumental, vocal, and general music fields.

Certificates

Music Entrepreneurship Certificate:

The certificate provides a basic understanding of music marketing principles and practical hands-on experience that allows one to enter the workforce with a marketable skill set in the areas of arts promotion and management. A certificate may be pursued on its own or in conjunction with any university degree program. https://www.uwyo.edu/music/certificates/music_entrep_index.html

Performer’s (post-baccalaureate) Certificate

A non-degree course of study for the student seeking to improve professional performance skills. The program consists of a total of 30 credit hours from applied lessons, ensembles and electives to be selected in consultation with the major adviser. Prerequisites are demonstrated evidence of advanced performance proficiency through a live or recorded audition, undergraduate degree in music, and admission to the university.

Music for Other Students

Music as an elective subject. Students from other departments of the university may, with consent of their adviser and applied instructor, elect private or class lessons in applied music (with or without previous training) and may enroll in any theory, music literature or activity course for which they are qualified. See the music department *Student Handbook* for requirements for a minor in music.

Organizations. Performance organizations include the Happy Jacks, Marching Band, Symphonic Band, Wind Ensemble, Collegiate Chorale, Symphony Orchestra,

Chamber Orchestra, Singing Statesmen, Bel Canto, Women's Choir, and Opera Theatre. Other groups are brass, woodwind, string, percussion and piano ensembles, Vocal Jazz, Civic Chorus and Jazz Ensemble. Membership is open to qualified students in all colleges and departments of the university. Each year, in addition to frequent appearances on the campus, several of these organizations and groups tour the region.

Music Fees

For Individual Instruction:

One 1/2-hour lesson weekly,
per semester\$150.00
One 1-hour lesson weekly,
per semester \$300.00

For Music 4510, 4520, 4530, 4540, 4550 and 4560 (courses taken in the form of private lessons) a fee of \$85.00 is assessed each semester.

Practice Rooms:

per semester\$35.00
Music instrumental fee, per semester...\$25.00
Music locker fee, per student
per semester\$15.00
Public School Methods fee, per class.....\$5.00

Undergraduate Study

Bachelor of Arts in Music

All music majors must successfully complete MUSC 0200 Convocation (0 credit, S/U) each semester in residence and must enroll in lessons and one major ensemble per semester. Each ensemble course is deemed to be a unique course even though the course number is not unique. To fulfill this degree requirement students will be expected to enroll in ensembles at the lower and upper divisions a minimum of four times with a career maximum of 8. Consult your advisor and the Music Handbook for specific information.

Learning Outcomes

Graduates of the UW Department of Music will develop the skills, concepts, and sensitivities essential to the professional life of a musician (NASM Handbook, p. 85).

At the completion of the Bachelor of Arts degree in Music, students will be able to: (1) demonstrate a level of competence as solo and ensemble performers appropriate for a musician educated in the liberal arts, (2) demonstrate specific knowledge in music theory, music history, and general studies appropriate for their professional goals, and (3) demonstrate the ability to think, speak, and write clearly and effectively about the art of music.

FRESHMAN YEAR: Fall	Hrs.
MUSC 0200.....	0
MUSC 1030.....	3
MUSC 1035.....	1
MUSC 1290.....	1
MUSC 2000-level Applied Lessons II.....	1
A 1000-level Ensemble.....	1
USP COM1 Course.....	3
USP FYS Course.....	3
USP H Course.....	3

FRESHMAN YEAR: Spring	Hrs.
MUSC 0200.....	0
MUSC 1003.....	3
MUSC 1040.....	3
MUSC 1045.....	1
MUSC 1295.....	1
MUSC 2000-level Applied Lessons II.....	1
A 1000-level Ensemble.....	1
USP Q Course.....	3
USP H Course.....	3

SOPHOMORE YEAR: Fall	Hrs.
MUSC 0200.....	0
MUSC 2030.....	3
MUSC 2035.....	1
MUSC 2050.....	3
MUSC 3000-level Applied Lessons III.....	1
A 1000-level Ensemble.....	1
USP V Course.....	3
USP PN Course.....	3

SOPHOMORE YEAR: Spring	Hrs.
MUSC 0200.....	0
MUSC 2055.....	3
MUSC 3255.....	0
MUSC 3000-level Applied Lessons III.....	1
A 1000-level Ensemble.....	1
USP PN Course.....	3
USP COM2 Course.....	3
Elective.....	3

JUNIOR YEAR: Fall	Hrs.
MUSC 0200.....	0
MUSC 4070.....	3
Upper division MUSC electives.....	6
MUSC 4000-level Applied Lessons IV.....	1
A 3000-level Ensemble.....	1
A&S Core Diversity in the U.S. Course.....	3
Elective.....	3

JUNIOR YEAR: Spring	Hrs.
MUSC 0200.....	0
MUSC 4000-level Applied Lessons IV.....	1
A 3000-level Ensemble.....	1
A&S Core Global Awareness Course.....	3
Upper division MUSC elective*.....	3
Electives.....	6

SENIOR YEAR: Fall	Hrs.
MUSC 0200.....	0
MUSC 5000-level Applied Lessons V.....	1
A 3000-level Ensemble.....	1
USP COM3 Course.....	3

Upper division MUSC elective.....	3
Electives.....	6

SENIOR YEAR: Spring	Hrs.
MUSC 0200.....	0
MUSC 5000-level Applied Lessons V.....	1
A 3000-level Ensemble.....	1
Upper division MUSC electives*.....	6
Electives.....	6

Degree Total 120

*Upper Division MUSC Electives: See complete list in Undergraduate Music Handbook.

University and College Requirements

In addition to the major requirements listed above, students must complete all university and College of Arts and Sciences requirements listed elsewhere in this *Catalog*. A minimum of 42 hours of the total degree must be at the junior/senior level. Check with your adviser about music courses which fulfill University Studies Program requirements.

Bachelor of Music in Performance

All music majors must successfully complete MUSC 0200 Convocation (0 credit, S/U) each semester in residence and must enroll in lessons and one major ensemble per semester. Each ensemble course is deemed to be a unique course even though the course number is not unique. To fulfill this degree requirements students will be expected to enroll in ensembles at the lower and upper divisions a minimum of four times with a career maximum of 8. All string and vocal emphases must pass the piano proficiency test during their sophomore year. Class Piano 1-4 is highly recommended for those with little piano background. All wind and percussion emphases must pass Class Piano 1-2 with a B or better or may substitute the Piano Literacy exam in their place. Consult your advisor and the Music Handbook for specific information.

Learning Outcomes

Graduates of the UW Department of Music will develop the skills, concepts, and sensitivities essential to the professional life of a musician (NASM Handbook, p. 85).

At the completion of the Bachelor of Music degree in Performance, students will be able to: (1) demonstrate excellence as solo and ensemble performers to provide a basis for a professional career as a musician, (2) demonstrate specific knowledge in music theory, music history, and instrumental pedagogy to provide a basis for a professional career as a performing musician, and (3) demonstrate the ability to think, speak, and write clearly and effectively about the art of music.

University and College Requirements

In addition to the major requirements listed above, students must complete all university and College of Arts and Sciences requirements listed elsewhere in this Catalog. A minimum of 42 hours of the total degree must be at the junior/senior level. Check with your adviser about music courses which fulfill University Studies Program requirements.

Upper Division Music Electives

Upper division music electives vary per emphasis. Please see the Undergraduate Music Handbook for a full listing.

Winds and Percussion Emphasis:

FRESHMAN YEAR: Fall	Hrs.
MUSC 0200.....	0
MUSC 1030.....	3
MUSC 1035.....	1
MUSC 1290.....	1
MUSC 2000-level Applied Lessons II.....	2
A 1000-level Ensemble.....	1
USP COM1 Course.....	3
USP FYS Course.....	3

FRESHMAN YEAR: Spring	Hrs.
MUSC 0200.....	0
MUSC 1003.....	3
MUSC 1040.....	3
MUSC 1045.....	1
MUSC 1295.....	1
MUSC 2000-level Applied Lessons II.....	2
A 1000-level Ensemble.....	1
USP Q Course.....	3

SOPHOMORE YEAR: Fall	Hrs.
MUSC 0200.....	0
MUSC 2030.....	3
MUSC 2035.....	1
MUSC 2050.....	3
MUSC 3000-level Applied Lessons III.....	2
A 1000-level Ensemble.....	1
USP PN Course.....	3
A&S Core Global Awareness Course.....	3

SOPHOMORE YEAR: Spring	Hrs.
MUSC 0200.....	0
MUSC 2040.....	3
MUSC 2045.....	1
MUSC 2055.....	3
MUSC 3255.....	0
MUSC 3000-level Applied Lessons III.....	2
A 1000-level Ensemble.....	1
USP PN Course.....	3
A&S Core Diversity in the U.S. Course.....	3

JUNIOR YEAR: Fall	Hrs.
MUSC 0200.....	0

MUSC 4070.....	3
MUSC 4000-level Applied Lessons IV.....	2
A 3000-level Ensemble.....	1
Upper division MUSC electives.....	6
USP COM2 Course.....	3

JUNIOR YEAR: Spring	Hrs.
MUSC 0200.....	0
MUSC 3500.....	0
MUSC 4615.....	2
MUSC 4000-level Applied Lessons IV.....	2
A 3000-level Ensemble.....	1
Upper division MUSC electives.....	6
USP V Course.....	3

SENIOR YEAR: Fall	Hrs.
MUSC 0200.....	0
MUSC 4040.....	2
MUSC 5000-level Applied Lessons V.....	2
A 3000-level Ensemble.....	1
Upper division MUSC elective.....	3
USP COM3 Course.....	3
USP H Course.....	3
Elective.....	3

SENIOR YEAR: Spring	Hrs.
MUSC 0200.....	0
MUSC 4590.....	2
MUSC 5000-level Applied Lessons V.....	2
A 3000-level Ensemble.....	1
Upper division MUSC elective.....	3
USP H Course.....	3
Elective.....	3

***Degree Total* 120**

String Emphasis:

FRESHMAN YEAR: Fall	Hrs.
MUSC 0200.....	0
MUSC 1030.....	3
MUSC 1035.....	1
MUSC 1290.....	1
MUSC 2000-level Applied Lessons II.....	2
A 1000-level Ensemble.....	1
USP COM1 Course.....	3
USP FYS Course.....	3
USP H Course.....	3

FRESHMAN YEAR: Spring	Hrs.
MUSC 0200.....	0
MUSC 1003.....	3
MUSC 1040.....	3
MUSC 1045.....	1
MUSC 1295.....	1
MUSC 2000-level Applied Lessons II.....	2
A 1000-level Ensemble.....	1
USP Q Course.....	3
USP H Course.....	3

SOPHOMORE YEAR: Fall	Hrs.
MUSC 0200.....	0
MUSC 2030.....	3
MUSC 2035.....	1
MUSC 2290.....	1
MUSC 2050.....	3
MUSC 3000-level Applied Lessons III.....	2
A 1000-level Ensemble.....	1
USP PN Course.....	3
USP V Course.....	3

SOPHOMORE YEAR: Spring	Hrs.
MUSC 0200.....	0
MUSC 2040.....	3
MUSC 2045.....	1
MUSC 2050.....	3
MUSC 2295.....	1
MUSC 2395.....	0
MUSC 3255.....	0
MUSC 3000-level Applied Lessons III.....	2
A 1000-level Ensemble.....	1
USP PN Course.....	3
USP COM2 Course.....	3

JUNIOR YEAR: Fall	Hrs.
MUSC 0200.....	0
MUSC 4070.....	3
MUSC 4651.....	2
MUSC 4000-level Applied Lessons IV.....	2
A 3000-level Ensemble.....	1
Upper division MUSC electives.....	6

JUNIOR YEAR: Spring	Hrs.
MUSC 0200.....	0
MUSC 3500.....	0
MUSC 4615.....	2
MUSC 4000-level Applied Lessons IV.....	2
A 3000-level Ensemble.....	1
Upper division MUSC electives.....	3
A&S Core Global Awareness Course.....	3
Elective.....	3

SENIOR YEAR: Fall	Hrs.
MUSC 0200.....	0
MUSC 4040.....	2
MUSC 5000-level Applied Lessons V.....	2
A 3000-level Ensemble.....	1
Upper division MUSC electives.....	6
USP COM3 Course.....	3

SENIOR YEAR: Spring	Hrs.
MUSC 0200.....	0
MUSC 4590.....	2
MUSC 5000-level Applied Lessons V.....	2
A 3000-level Ensemble.....	1
Upper division MUSC elective.....	3
A&S Core Diversity in the U.S. Course.....	3
Elective.....	3

***Degree Total* 120**

Vocal Emphasis:**FRESHMAN YEAR: Fall** Hrs.

MUSC 0200.....	0
MUSC 1030.....	3
MUSC 1035.....	1
MUSC 1290.....	1
MUSC 2320.....	2
MUSC 2270-06.....	2
A 1000-level Ensemble.....	1
USP COM1 Course.....	3
USP FYS Course.....	3

FRESHMAN YEAR: Spring Hrs.

MUSC 0200.....	0
MUSC 1003.....	3
MUSC 1040.....	3
MUSC 1045.....	1
MUSC 1295.....	1
MUSC 2325.....	2
MUSC 2000-level Applied Lessons II.....	2
A 1000-level Ensemble.....	1
USP Q Course.....	3

SOPHOMORE YEAR: Fall Hrs.

MUSC 0200.....	0
MUSC 2030.....	3
MUSC 2035.....	1
MUSC 2050.....	3
MUSC 2290.....	1
MUSC 3000-level Applied Lessons III.....	2
A 1000-level Ensemble.....	1
USP H Course/Foreign Language.....	4

SOPHOMORE YEAR: Spring Hrs.

MUSC 0200.....	0
MUSC 2040.....	3
MUSC 2045.....	1
MUSC 2055.....	3
MUSC 2395.....	0
MUSC 3255.....	0
MUSC 3295.....	1
MUSC 3000-level Applied Lessons III.....	2
A 1000-level Ensemble.....	1
USP H Course/Foreign Language.....	4

JUNIOR YEAR: Fall Hrs.

MUSC 0200.....	0
MUSC 4070.....	3
MUSC 4000-level Applied Lessons IV.....	2
A 3000-level Ensemble.....	1
Upper division MUSC electives.....	5
USP COM2 Course.....	3

JUNIOR YEAR: Spring Hrs.

MUSC 0200.....	0
MUSC 3500.....	0
MUSC 4610.....	2
MUSC 4000-level Applied Lessons IV.....	2
A 3000-level Ensemble.....	1
Upper division MUSC electives.....	5
UPS V Course.....	3

SENIOR YEAR: Fall Hrs.

MUSC 0200.....	0
MUSC 5000-level Applied Lessons V.....	2
A 3000-level Ensemble.....	1
Upper division MUSC elective.....	3
USP COM3 Course.....	3
USP PN Course.....	3
A&S Core Diversity in the U.S. Course.....	3

SENIOR YEAR: Spring Hrs.

MUSC 0200.....	0
MUSC 4590.....	2
MUSC 5000-level Applied Lessons V.....	2
A 3000-level Ensemble.....	1
Upper division MUSC elective.....	3
USP PN Course.....	3
A&S Core Global Awareness Course.....	3

Degree Total 120**Keyboard Emphasis:****FRESHMAN YEAR: Fall** Hrs.

MUSC 0200.....	0
MUSC 1030.....	3
MUSC 1035.....	1
MUSC 2000-level Applied Lessons II.....	2
MUSC 1280.....	1
USP COM1 Course.....	3
USP FYS Course.....	3
USP H Course.....	3

FRESHMAN YEAR: Spring Hrs.

MUSC 0200.....	0
MUSC 1003.....	3
MUSC 1040.....	3
MUSC 1045.....	1
MUSC 2000-level Applied Lessons II.....	2
MUSC 1280.....	1
USP Q Course.....	3
USP H Course.....	3

SOPHOMORE YEAR: Fall Hrs.

MUSC 0200.....	0
MUSC 2030.....	3
MUSC 2035.....	1
MUSC 2050.....	3
MUSC 3000-level Applied Lessons III.....	2
MUSC 1280.....	1
USP PN Course.....	3
USP V Course.....	3

SOPHOMORE YEAR: Spring Hrs.

MUSC 0200.....	0
MUSC 2040.....	3
MUSC 2045.....	1
MUSC 2055.....	3
MUSC 2395.....	0
MUSC 3255.....	0
MUSC 3000-level Applied Lessons III.....	2
MUSC 1280.....	1
USP PN Course.....	3
USP COM2 Course.....	3

JUNIOR YEAR: Fall Hrs.

MUSC 0200.....	0
MUSC 4070.....	3
MUSC 4600.....	2
MUSC 4000-level Applied Lessons IV.....	2
MUSC 3280.....	1
Upper division MUSC electives.....	6

JUNIOR YEAR: Spring Hrs.

MUSC 0200.....	0
MUSC 3500.....	0
MUSC 4000-level Applied Lessons IV.....	2
MUSC 3280.....	1
Upper division MUSC electives.....	5
A&S Core Global Awareness Course.....	3
Elective.....	3

SENIOR YEAR: Fall Hrs.

MUSC 0200.....	0
MUSC 4040.....	2
MUSC 4650.....	3
MUSC 5000-level Applied Lessons V.....	2
MUSC 3280.....	1
Upper division MUSC elective.....	3
USP COM3 Course.....	3

SENIOR YEAR: Spring Hrs.

MUSC 0200.....	0
MUSC 4590.....	2
MUSC 5000-level Applied Lessons V.....	2
MUSC 3280.....	1
Upper division MUSC elective.....	3
A&S Core Diversity in the U.S. Course.....	3
Elective.....	3

Degree Total 120**Bachelor of Music Education**

All music majors must successfully complete MUSC 0200 Convocation (0 credit, S/U) each semester in residence and must enroll in lessons and one major ensemble per semester. Each ensemble course is deemed to be a unique course even though the course number is not unique. To fulfill this degree requirement students will be expected to enroll in ensembles at the lower and upper divisions a minimum of four times with a career maximum of 8. All music majors must pass the piano proficiency test during their sophomore year. Class Piano 1-4 is highly recommended for majors with little piano background. Consult your advisor and the Music Handbook for specific information.

Learning Outcomes

Graduates of the UW Department of Music will develop the skills, concepts, and sensitivities essential to the professional life of a musician (NASM Handbook, p. 85).

At the completion of the Bachelor of Music Education degree, students will be able to: (1) demonstrate skill as solo and ensemble performers who can work as professional educators, (2) demonstrate specific knowledge in music theory, music history, and instrumental and vocal pedagogy to provide a basis for a professional career as a music educator, (3) demonstrate the ability to think, speak, and write clearly and effectively about the art of music, and (4) demonstrate the pedagogical background and teaching experience to function as effective K-12 music educators.

University and College Requirements

In addition to the major requirements listed below, students must complete all university requirements listed elsewhere in this *Catalog*. A minimum of 42 hours of the total degree must be at the junior/senior level. Check with your adviser about music courses which fulfill University Studies Program requirements.

Bachelor of Music Education - Brass, Woodwind, & Percussion Emphasis

FRESHMAN YEAR: Fall	Hrs.
MUSC 0200.....	0
MUSC 1030.....	3
MUSC 1035.....	1
MUSC 1290.....	1
MUSC 1370.....	1
MUSC 2000-level Applied Lessons II.....	1
USP COM1 Course.....	3
USP FYS Course.....	3
USP H Course.....	3

FRESHMAN YEAR: Spring	Hrs.
MUSC 0200.....	0
MUSC 1003.....	3
MUSC 1025.....	2
MUSC 1040.....	3
MUSC 1045.....	1
MUSC 1295.....	1
MUSC 2000-level Applied Lessons II.....	1
A 1000-level Ensemble.....	1
USP Q Course.....	3

SOPHOMORE YEAR: Fall	Hrs.
MUSC 0200.....	0
MUSC 1340.....	1
MUSC 1352.....	2
MUSC 1360.....	1
MUSC 2030.....	3
MUSC 2035.....	1
MUSC 2050.....	3
MUSC 2290.....	1
MUSC 3000-level Applied Lessons III.....	1
A 1000-level Ensemble.....	1
USP COM2 Course.....	3

SOPHOMORE YEAR: Spring	Hrs.
MUSC 0200.....	0
MUSC 1312.....	2
MUSC 1332.....	2
MUSC 2040.....	3
MUSC 2045.....	1
MUSC 2055.....	3
MUSC 2295.....	1
MUSC 2395.....	0
MUSC 3255.....	0
MUSC 3265.....	0
MUSC 3000-level Applied Lessons III.....	1
A 1000-level Ensemble.....	1
USP V Course.....	3

JUNIOR YEAR: Fall	Hrs.
EDST 2450.....	3
MUSC 0200.....	0
MUSC 1322.....	2
MUSC 4070.....	3
MUSC 4455.....	3
MUSC 4705.....	1
MUSC 4750.....	1
MUSC 4000-level Applied Lessons IV.....	1
A 3000-level Ensemble.....	1

JUNIOR YEAR: Spring	Hrs.
EDEX 2484.....	3
MUSC 0200.....	0
MUSC 4380.....	2
MUSC 4460.....	3
MUSC 4620.....	1
MUSC 4780.....	2
MUSC 4000-level Applied Lessons IV.....	1
A 3000-level Ensemble.....	1
USP PN Course.....	3

SENIOR YEAR: Fall	Hrs.
MUSC 0200.....	0
MUSC 3015.....	3
MUSC 4155.....	0
MUSC 4465.....	3
MUSC 4715.....	1
MUSC 5000-level Applied Lessons V.....	2
A 3000-level Ensemble.....	1
USP PN Course.....	3

SENIOR YEAR: Spring*	Hrs.
MUSC 4700.....	8
MUSC 4710.....	8

*No other coursework may be taken during residency; requires 2.750 UW GPA and 3.000 GPA in major content courses.

Degree Total 121

Bachelor of Music Education - String Emphasis

FRESHMAN YEAR: Fall	Hrs.
MUSC 0200.....	0
MUSC 1030.....	3
MUSC 1035.....	1
MUSC 1290.....	1
MUSC 2000-level Applied Lessons II.....	1
A 1000-level Ensemble.....	1
USP COM1 Course.....	3
USP FYS Course.....	3

FRESHMAN YEAR: Spring	Hrs.
MUSC 0200.....	0
MUSC 1003.....	3
MUSC 1025.....	2
MUSC 1040.....	3
MUSC 1045.....	1
MUSC 1295.....	1
MUSC 2000-level Applied Lessons II.....	1
A 1000-level Ensemble.....	1
USP Q Course.....	3

SOPHOMORE YEAR: Fall	Hrs.
MUSC 0200.....	0
MUSC 1352.....	2
MUSC 1340.....	1
MUSC 1360.....	1
MUSC 2030.....	3
MUSC 2035.....	1
MUSC 2050.....	3
MUSC 2290.....	1
MUSC 3000-level Applied Lessons III.....	1
A 1000-level Ensemble.....	1
USP COM2 Course.....	3

SOPHOMORE YEAR: Spring	Hrs.
MUSC 0200.....	0
MUSC 1312.....	2
MUSC 1332.....	2
MUSC 2040.....	3
MUSC 2045.....	1
MUSC 2055.....	3
MUSC 2295.....	1
MUSC 2395.....	0
MUSC 3255.....	0
MUSC 3265.....	0
MUSC 3000-level Applied Lessons III.....	1
A 1000-level Ensemble.....	1
USP V Course.....	3

JUNIOR YEAR: Fall	Hrs.
EDST 2450.....	3
MUSC 0200.....	0
MUSC 1322.....	2
MUSC 4455.....	3
MUSC 4705.....	1
MUSC 4070.....	3
MUSC 1*** Second String Instrument.....	1
MUSC 4000-level Applied Lessons IV.....	1
A 3000-level Ensemble.....	1

JUNIOR YEAR: Spring		Hrs.
EDEX 2484.....	3	
MUSC 0200.....	0	
MUSC 4460.....	3	
MUSC 4620.....	1	
MUSC 4780.....	2	
MUSC 1*** Second String Instrument.....	1	
MUSC 4000-level Applied Lessons IV.....	1	
A 3000-level Ensemble.....	1	
USP PN Course.....	3	

SENIOR YEAR: Fall		Hrs.
MUSC 0200.....	0	
MUSC 3015.....	3	
MUSC 4155.....	0	
MUSC 4715.....	1	
MUSC 4465.....	3	
MUSC 5000-level Applied Lessons V.....	2	
A 3000-level Ensemble.....	1	
USP PN Course.....	3	
USP H Course.....	3	

SENIOR YEAR: Spring*		Hrs.
MUSC 4700.....	8	
MUSC 4710.....	8	

*No other coursework may be taken during residency; requires 2.750 UW GPA and 3.000 GPA in major content courses.

Degree Total **126**

Bachelor of Music Education - Vocal Emphasis

FRESHMAN YEAR: Fall		Hrs.
MUSC 0200.....	0	
MUSC 1030.....	3	
MUSC 1035.....	1	
MUSC 1290.....	1	
MUSC 2320.....	2	
MUSC 2270-06.....	1	
A 1000-level Ensemble.....	1	
USP COM1 Course.....	3	
USP FYS Course.....	3	

FRESHMAN YEAR: Spring		Hrs.
MUSC 0200.....	0	
MUSC 1003.....	3	
MUSC 1025.....	2	
MUSC 1040.....	3	
MUSC 1045.....	1	
MUSC 1295.....	1	
MUSC 2000-level Applied Lessons II.....	1	
A 1000-level Ensemble.....	1	
USP Q Course.....	3	

SOPHOMORE YEAR: Fall		Hrs.
MUSC 0200.....	0	
MUSC 1340.....	1	
MUSC 1352.....	2	
MUSC 1360.....	1	
MUSC 2030.....	3	
MUSC 2035.....	1	
MUSC 2050.....	3	
MUSC 2290.....	1	
MUSC 3000-level Applied Lessons III.....	1	
A 1000-level Ensemble.....	1	
USP COM2 Course.....	3	

SOPHOMORE YEAR: Spring		Hrs.
MUSC 0200.....	0	
MUSC 1312.....	2	
MUSC 1332.....	2	
MUSC 2040.....	3	
MUSC 2045.....	1	
MUSC 2055.....	3	
MUSC 2295.....	1	
MUSC 2395.....	0	
MUSC 3255.....	0	
MUSC 3265.....	0	
MUSC 3000-level Applied Lessons III.....	1	
A 1000-level Ensemble.....	1	
USP V Course.....	3	

JUNIOR YEAR: Fall		Hrs.
EDST 2450.....	3	
MUSC 0200.....	0	
MUSC 1322.....	2	
MUSC 4455.....	3	
MUSC 4705.....	1	
MUSC 4070.....	3	
MUSC 4000-level Applied Lessons IV.....	1	
A 3000-level Ensemble.....	1	

JUNIOR YEAR: Spring		Hrs.
EDEX 2484.....	3	
MUSC 0200.....	0	
MUSC 4460.....	3	
MUSC 4620.....	1	
MUSC 4790.....	2	
MUSC 4000-level Applied Lessons IV.....	1	
A 3000-level Ensemble.....	1	
USP PN Course.....	3	

SENIOR YEAR: Fall		Hrs.
MUSC 0200.....	0	
MUSC 3015.....	3	
MUSC 4155.....	0	
MUSC 4465.....	3	
MUSC 4715.....	1	
MUSC 5000-level Applied Lessons V.....	2	
A 3000-level Ensemble.....	1	
USP PN Course.....	3	
USP H Course.....	3	

SENIOR YEAR: Spring*		Hrs.
MUSC 4700.....	8	
MUSC 4710.....	8	

*No other coursework may be taken during residency; requires 2.750 UW GPA and 3.000 GPA in major content courses.

Degree Total **124**

Graduate Study

The Department of Music offers programs leading to the Master of Music in Performance and to the Master of Music Education.

The following prerequisites and credit hours will pertain to individual lessons for all the instruments and voice listed below. All students enrolled in MUSC 5080 through MUSC 5670 levels will be required to take a jury examination at the end of the semester to determine, in part, the final grade. (See current fee schedule for listing of fees in Individual Lessons.)

Program Specific Admission Requirements

In addition to the minimum requirements set forth in this *Catalog*, the Department of Music requires that applicants for graduate programs submit supplementary documentation of their preparation for advanced study in music.

Those interested in graduate study in music are encouraged to contact the Graduate Studies Coordinator for the Department of Music, Dr. Beth Vanderborgh (bvander@uwyo.edu), or the Area Coordinator for each instrument or voice cited on the Department of Music website (www.uwyo.edu/music/).

In order to apply, please submit the following via the University of Wyoming's online application system (www.uwyo.edu/admissions/apply.html):

- three letters of recommendation
- the Graduate Teaching Assistantship application
- academic transcripts

A minimum undergraduate cumulative GPA of 3.000 is required. The GRE is not required for admission consideration.

All accepted graduate students in the Mast of Music (MM) or Master of Music Education (MME) programs will take the Graduate Entrance Examinations in music history and music theory prior to matriculation. If a student does not pass one or more sections, they must take an online refresher course prior to undertaking advanced coursework.

International applicants who are not native English speakers must submit TOEFL or IELTS scores (TOEFL minimum = 76, IELTS minimum = 6.5). If an international applicant wishes to be considered for a Graduate Teaching Assistantship, the applicant should also submit the results of an Oral Proficiency Interview (OPI). Please contact the UW English Language Center if you have questions regarding the OPI (www.uwyo.edu/elc/international-teaching-assistants/graduate_admissions/index.html).

Applicants for the MM program should also request an audition and apply for music scholarship consideration via the Audition and Scholarships link found on the Graduate page of the Department of Music website (www.uwyo.edu/music/graduate_students/index.html). Applicants for the MME program should send their supporting documents (video of teaching/rehearsing, statement of music education philosophy, writing sample) directly to Dr. Crystal Sieger, Music Education Coordinator (csieger@uwyo.edu).

Master of Music Education

An earned, documented Bachelor of Music Education degree from an accredited institution of higher learning.

One year of teaching experience plus:

An active background in music education,

A DVD of classroom teaching and/or rehearsing,

A one- to three-page statement of music education philosophy,

Three letters of recommendation, one from an immediate supervisor, of teaching effectiveness.

A writing sample from an extensive undergraduate research paper.

Learning Outcomes

1. Students will demonstrate the advanced musical and pedagogical knowledge and research/writing skills necessary to enhance their teaching abilities in a P-16 vocal and/or instrumental teaching position.
2. Students will demonstrate the advanced musical and pedagogical knowledge and research/writing/and communication skills necessary to solve contemporary music problems.

Master of Music in Performance

An earned, documented bachelor of music performance or bachelor of arts from an accredited institution of higher learning. Live audition (preferred), live remote video audition, or links to an online video demonstrating:

- A strong sense of musicality,
- Technical proficiency,
- Stylistically correct performance practices in at least three historical periods, where applicable,
- A working knowledge of the standard repertoire,
- Also, a portfolio of work showing concentrated activity on the major instrument or voice area.

Learning Outcomes

1. Graduate students will be excellent performers on voice or instrument.
2. Graduate students will demonstrate the advanced musical and pedagogical knowledge and research writing skills necessary to begin their professional performing career and/or demonstrate their readiness to teach at the college and/or university level and/or pursue doctoral degrees.

Program Specific Graduate Assistantships

Graduate assistantships are awarded on a competitive basis to defray some of the costs of graduate study and to provide practical experience working under the guidance of faculty members.

Criteria that are taken into account in awarding assistantships include: academic preparation, performing ability, and special skills that would prove valuable in carrying out the duties of the assistantship, as well as, needs of the department.

To be considered for a graduate assistantship, the candidate must be fully admitted through the university. The application for an assistantship is accessed via the UW Graduate Admissions application. After considering the merits of the application, the department then nominates candidates to the university. Applications for assistantships are due by February 15.

Program Specific Degree Requirements

Master's Programs

Each of the degree programs consists of 30 semester hours of work composed of the

following elements:

Basic music core (11 hours)

MUSC 5310. Bibliographical Research, 2 hours

Upper-division music history, 3 to 6 hours

Upper-division music theory, 3 to 6 hours

Major area courses (12-16 hours)

Thesis requirement (Plan A, four hours); (Plan B, zero hours)

The thesis requirement may be fulfilled under the Plan B paper/lecture-recital as appropriate to the specific degree program. A proposal for a thesis or Plan B paper must be submitted to and approved by the student's graduate committee chair.

Electives (0 to 7 hours)

Master of Music Education

Plan A or Plan B

To earn a Master of Music Education, students must complete the following requirements:

Basic music core, (11 hours)

Major area courses (12 - 15 hours)

EDRE 5530. Introduction to Research, 3 hours

MUSC 5760. Music Education Seminar, 2 hours

MUSC 5720. Music Supervision, 2 hours

Music education electives, 5-8 hours

Thesis requirement (0 to 4 hours)

Plan A: MUSC 5960. Thesis Research, four hours (the thesis must be on a music education topic), or

Plan B: Plan B paper, plus extra courses, 0 hours

Electives (4 to 7 hours)

Master of Music in Performance

Plan B

To earn a Master of Music in Performance, students must complete the following requirements:

Basic music core (11 hours minimum)

Major area courses (16 hours minimum)

MUSC 5480-5670. Private Lessons in major instrument or voice. A minimum of 8 hours.

MUSC 5770-5890. Ensembles, 2 hours

MUSC 5680. Graduate Recital, 2 hours.

A faculty jury must approve a recital given for credit one month prior to the performance. The faculty jury will determine the grade after the performance.

MUSC 5390. Performance Practice and Interpretation, 2 hours

MUSC 5320. Advanced Seminar, 3 hours

MUSC 4***. Pedagogy (instrument

specific), 2 hours

Requirement in lieu of thesis:

Plan B paper, or 1-hour lecture-recital

Foreign language requirement (voice majors only). Singers must demonstrate acceptable proficiency in singing in Italian, German, French, and English.

Electives (0 to 3 hours)

Both degrees require successful completion of the written comprehensive exams, which cover theory, history, and the major area.

Music (MUSC)

Individual Lessons: All students enrolled in MUSC 2080 through MUSC 5670 levels will be required to take a jury examination at the end of the semester to determine, in part, the final grade. (See current fee schedule for listing of fees in individual lessons.)

Students must receive a “C” or better in all courses designated MUSC to satisfy department degree requirements. A student’s transfer courses in music must also reflect a “C” or better to be accepted for credit.

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

0200. Music Convocation. 0. Weekly recital hour for student, faculty and guest performances. Offered satisfactory/unsatisfactory only. *Prerequisite:* intended for, and required of music majors.

Applied Lessons:

1080 through 1270 I. 1-2 (Max. 8).

2080 through 2270 II. 1-2 (Max. 8). *Prerequisite:* previous training proven with an audition or 2-4 semester hours of MUSC 1080 through MUSC 1270 on the same instrument.

3080 through 3270 III. 1-2 (Max. 8). *Prerequisite:* 2-4 semester hours of MUSC 2080 through MUSC 2270 on the same instrument.

4080 through 4270 IV. 1-2 (Max. 8). *Prerequisite:* 2-4 semester hours of MUSC 3080 through MUSC 3270 on the same instrument.

Majors begin at the 2000 level.

1080. Baritone Horn I

1090. Bassoon I

1100. Cello I

1110. Clarinet I

1120. Double Bass I

1130. Flute I

1140. French Horn I

1150. Guitar I

1160. Harp I

1170. Oboe I

1180. Organ I

1190. Percussion I

1200. Piano I

1210. Saxophone I

1220. Trombone I

1230. Trumpet I

1240. Tuba I

1250. Violin I

1260. Viola I

1270. Voice I

2080. Baritone Horn II

2090. Bassoon II

2100. Cello II

2110. Clarinet II

2120. Double Bass II

2130. Flute II

2140. French Horn II

2150. Guitar II

2160. Harp II

2170. Oboe II

2180. Organ II

2190. Percussion II

2200. Piano II

2210. Saxophone II

2220. Trombone II

2230. Trumpet II

2240. Tuba II

2250. Violin II

2260. Viola II

2270. Voice II

3080. Baritone Horn III

3090. Bassoon III

3100. Cello III

3110. Clarinet III

3120. Double Bass III

3130. Flute III

3140. French Horn III

3150. Guitar III

3160. Harp III

3170. Oboe III

3180. Organ III

3190. Percussion III

3200. Piano III

3210. Saxophone III

3220. Trombone III

3230. Trumpet III

3240. Tuba III

3250. Violin III

3260. Viola III

3270. Voice III

Prerequisites for the following courses: 2-4 semester hours of MUSC 3080 through MUSC 3270 on the same instrument and satisfactory completion of MUSC 3255.

4080. Baritone Horn IV

4090. Bassoon IV

4100. Cello IV

4110. Clarinet IV

4120. Double Bass IV

4130. Flute IV

4140. French Horn IV

4150. Guitar IV

4160. Harp IV

4170. Oboe IV

4180. Organ IV

4190. Percussion IV

4200. Piano IV

4210. Saxophone IV

4220. Trombone IV

4230. Trumpet IV

4240. Tuba IV

4250. Violin IV

4260. Viola IV

4270. Voice IV

1000. Introduction to Music. 3. [CA◀▶H]

Introduces music appreciation to students who have little or no musical training. Requires attendance at a specified number of public concerts.

1003. Historical Perspectives in Music I. 3.

The first semester of a three semester sequence covering the study of composers and music repertoire from antiquity to 1600. *Prerequisite:* Music majors and minors, or by permission of the instructor.

1007. Hip-Hop/Pop Music Appreciation. 3.

From Kool Herc, Notorious B.I.G., Van Halen, and Queen, all the way up to today’s artists, students will learn to understand, discern, and truly appreciate hip-hop and popular music.

1010. Music Fundamentals. 3. To establish/review the foundation of the materials and structures of music theory fundamentals.

1025 [1020]. Introduction to Music Educa-

tion. 2. Introduces music teacher education. Includes overview of vocal and instrumental music education and teaching processes in grade levels K-12. Requires on-site visits and observations of music programs. *Prerequisite:* music majors only. (Offered spring semester)

1030. Written Theory I. 3. First semester of a one-year series. Studies fundamentals of music and written harmony. *Prerequisite:* music majors/minors only.

1035. Aural Theory I. 1. First semester of a one-year series. Studies ear training and sight singing.

1040. Written Theory II. 3. Second semester of a one-year series. Studies fundamentals of music and written harmony. *Prerequisite:* MUSC 1030 and music majors/minors only.

1045. Aural Theory II. 1. Second semester of a one-year series. Studies ear training and sight singing. *Prerequisite:* MUSC 1035.

1280. Collaborative Piano I. 1-2 (Max. 8). Encompasses supervised practice in the art of collaborative piano playing. Discusses tradi-

tional usages as applicable to various schools and periods of vocal and instrumental duo literature. *Prerequisite:* audition required.

1290. Elementary Class Piano I. 1. Encompasses group instruction for the beginner at the keyboard. First semester of four-semester sequence. Enrollment limited to music or music education majors whose principal performance area is not piano. (Offered fall semester)

1295. Elementary Class Piano II. 1. Continues skills begun in MUSC 1290 including all major scales, beginning minor scales, prescribed chord progressions, harmonization, transposition, sight reading and repertoire. *Prerequisite:* MUSC 1290 or successful completion of final exam requirements for MUSC 1290. (Offered spring semester)

1310. Public School Methods: Brass I. 1 (Max. 2). Encompasses group instruction in brass instruments for music education majors. Instruments are supplied. *Prerequisites:* MUSC 1040, 1045.

1312. Public School Tech: Brass. 2. This course is designed to teach the fundamentals of brass pedagogy and performance for music education majors. The course consists of two components applied study on brass instruments and study/discussion of current pedagogy and methods. Restricted to Music Education majors. *Prerequisites:* MUSC 1040, MUSC 1045.

1315. Public School Methods: Brass II. 1 (Max. 2). Encompasses group instruction in brass instruments for music education majors. Instruments are supplied. *Prerequisites:* MUSC 1040, 1045.

1320. Public School Methods: Percussion I. 1 (Max. 2). Encompasses group instruction in percussion instruments for music education majors. Instruments are supplied. *Prerequisites:* MUSC 1040, 1045.

1322. Public School Tech: Percussion. 2. This course is designed to teach the fundamentals of percussion pedagogy and performance for music education majors. The course consists of two components applied study on percussion instruments and study/discussion of current pedagogy and methods. Restricted to Music Education majors. *Prerequisites:* MUSC 1040, MUSC 1045.

1325. Public School Methods: Percussion II. 1 (Max. 2). Encompasses group instruction in percussion instruments for music education majors. Instruments are supplied. *Prerequisites:* MUSC 1040, 1045.

1330. Public School Methods: Strings I. 1 (Max. 2). Encompasses group instruction in string instruments for music education majors. Instruments are supplied. *Prerequisites:* MUSC 1040, 1045.

1332. Public School Tech: Strings. 2. This course is designed to teach the fundamentals of string pedagogy and performance for music education majors. The course consists of two components applied study on string instruments and study/discussion of current pedagogy and methods. Restricted to Music Education majors. *Prerequisites:* MUSC 1040, MUSC 1045.

1335. Public School Methods: Strings II. 1 (Max. 2). Encompasses group instruction in string instruments for music education majors. Instruments are supplied. *Prerequisites:* MUSC 1040, 1045.

1340. Public School Methods: Voice I. 1 (Max. 2). Encompasses group instruction in vocal methods for music education majors. *Prerequisites:* MUSC 1040, 1045.

1350. Public School Methods: Woodwinds I. 1 (Max. 2). Encompasses group instruction in woodwind methods for music education majors. Instruments are supplied. *Prerequisites:* MUSC 1040, 1045.

1352. Public School Tech: Woodwinds. 2. This course is designed to teach the fundamentals of woodwind pedagogy and performance for music education majors. The course consists of two components applied study on woodwind instruments and study/discussion of current pedagogy and methods. Restricted to Music Education majors. *Prerequisites:* MUSC 1040, MUSC 1045.

1355. Public School Methods: Woodwinds II. 1 (Max. 2). Encompasses group instruction in woodwind methods for music education majors. Instruments are supplied. *Prerequisites:* MUSC 1040, 1045.

1360. Public School Methods: Guitar. 1 (Max. 2). Encompasses group instruction in guitar for music education majors. Instruments are supplied. *Prerequisites:* MUSC 1040, 1045.

1370, 1375, 1380, 1390, 1400, 1420, 1430, 1440, 1450, 1460, 1470, 1480, 1490. Ensembles. Maximum of 14 semester hours may be used toward the bachelor's degree from any combination of these courses. Music majors must play in one ensemble each semester in residence. Scholarship recipients must play in two ensembles each semester in residence.

1370. Marching Band. 1 (Max. 8). Fall semester: marching band.

1375. Symphonic Band. 1 (Max. 8). *Prerequisite:* players are selected by audition. Auditions will take place the first week of classes.

1380. Wind Ensemble. 1 (Max. 8). **[CA♦(none)]** *Prerequisite:* players are selected by audition from the university band.

1390. Jazz Ensemble. 1 (Max. 8). **[(none)♦H]** Preparation and performance in a select jazz ensemble of the finest in standard jazz ensemble repertoire and contemporary compositions by living jazz artists. *Prerequisites:* audition required; restricted to freshmen and sophomores.

1400. Collegiate Chorale I. 1 (Max. 12). **[CA♦H]** Will provide the committed singer with outstanding performing experiences ranging from major choral masterworks to masterpieces of the *a cappella* tradition, both sacred and secular. The choir is a professional training ensemble, and each student will explore a variety of vocal techniques for development. *Prerequisite:* Audition required.

1405. The UW Singing Statesmen I. 1 (Max 12). **[(none)♦H]** Will provide all levels of singer with the rich tradition of male ensemble singing. Students will solidify basic musicianship skills and vocal technique while experiencing camaraderie and service to the region. This ensemble is open to both music majors and non-music majors without audition.

1407. Happy Jacks I. 1 (Max 12). Student-led male *a cappella* ensemble that sings contemporary, jazz, and traditional repertoire. The ensemble travels regularly to promote male singing through concerts and school workshops. *Prerequisites:* Audition required. Co-requisite: enrollment in The UW Singing Statesmen.

1411. Vocal Jazz I. 1 (Max 12). Sings standard repertoire from various jazz traditions, often with rhythm section. Focus on building musical skill and literacy in the jazz idiom. *Prerequisites:* Audition required.

1415. Bel Canto Women's Chorus. 1 (Max 12). **[(none)♦H]** Builds community through score study and the development of fundamental musicianship skills, including sight singing, ear training, and vocal technique. This ensemble is open to both music majors and non-music majors without audition.

1417. Laramie Civic Chorus I. 1 (Max 12). **[(none)♦H]** Welcomes students, faculty, and community members. Repertoire includes musical works from a multiplicity of style periods and genres in both Western and non-Western traditions and includes regular collaboration with the UW Symphony Orchestra for major choral works. *Prerequisites:* Audition required.

1420. Opera Theatre. 1 (Max. 8).

1430. Symphony Orchestra I. 1 (Max. 8). **[CA♦H]** The premier orchestral ensemble in the Department of Music. Participation in this ensemble prepares students to perform some

of the great symphonic literature from a wide variety of musical periods. Prerequisite: audition only, freshmen and sophomores.

1440. Chamber Orchestra I. 1 (Max. 8). Devoted to the rehearsal and performance of masterpieces from the chamber orchestra repertoire. Students in the 1440 level of Chamber Orchestra will be expected to have a competent level of proficiency on their parts.

1450. Percussion Ensemble. 1 (Max. 8). Present concerts that represent the literature and techniques of this growing genre in music.

1460. Brass Ensemble. 1 (Max. 8). The University of Wyoming Brass Ensemble is a course devoted to the rehearsal and performance of masterpieces from the brass chamber repertoire. Students in the 1460 level of Brass Ensemble will be expected to have a competent level of proficiency on their parts.

1470. Woodwind Ensemble. 1 (Max. 8). Preparation and performance in a select woodwind chamber ensemble of the finest standard and contemporary wind ensemble literature. Enrollment is restricted freshmen and sophomores. Prerequisite: audition required.

1480. Chamber Music I. 1 (Max. 8). Designed to provide students with training in the ideal medium of chamber music (small ensembles, such as trio, string quartet, etc.), where they can apply and integrate all elements of their musical knowledge. These include but are not limited to rhythm, intonation, tone-production, blend, musical interpretation, concept of style, etc. Prerequisite: audition required.

2030. Written Theory III. 3. First semester of a one-year series. Studies chromatic harmony, contrapuntal techniques and twentieth-century practices. Prerequisites: MUSC 1030 and 1040.

2035. Aural Theory III. 1. First semester of a one-year series. Continues MUSC 1035 and 1045. Prerequisites: MUSC 1035 and 1045.

2040. Written Theory IV. 3. Fourth semester of a two-year series. Explores the instruments of the band and orchestra, and the capabilities of writing for voices and piano. Arranging for various instrumental combinations and vocal ensembles. Prerequisite: MUSC 2030.

2045. Aural Theory IV. 1. Second semester of a one-year series. Continues MUSC 1035 and 1045. Prerequisite: MUSC 2035.

2050. Historical Perspectives in Music II. 3. Continuation of materials and topics covered in Historical Perspectives in Music I. Study of composers and repertoire from 1600-ca. to 1800. Prerequisite: MUSC 1003, or by permission of instructor.

2055. Historical Survey II. 3 (Max. 6). Second semester of one-year series. Studies history and literature of music from the Classical Era to present. Prerequisite: ability to read music.

2290. Elementary Class Piano III. 1. Third semester of four-semester sequence developing further piano skills for non-pianists. Involves prescribed scales, arpeggios, harmonizations, chord progressions, transpositions, sight-reading and repertoire. Prerequisite: MUSC 1295 or successful completion of final exam for MUSC 1295. (Normally offered fall semester)

2295. Elementary Class Piano IV. 1. Final semester of four-semester sequence of piano skills for non-pianists in which the final exam is the departmental piano proficiency exam. Prerequisite: MUSC 2290 or successful completion of the final exams for preceding courses. (Normally offered spring semester)

2320. Diction for Singers I. 2. Studies phonetic sounds of English and Italian. (Offered fall semester)

2325. Diction for Singers II. 2. Studies phonetic sounds of French and German. (Usually offered spring semester)

2395. Piano Proficiency. 0. Piano proficiency test is offered at the end of each fall and spring semester. Students may enroll in MUSC 2395 a maximum of 2 times. Consult the Music Department Handbook for specific requirements. Offered satisfactory/unsatisfactory only.

3015 [2015]. Introduction to the Music of the World's Peoples. 3. [WB,G◀(none)] Students develop three primary interconnected literacies for the study and understanding of musics of other cultures: analytical music listening, understanding the concept of music culture, and interpretation of musical events. Student writing is a primary tool for developing these literacies. Texts from the Oxford University Press Global Music Series to study musics of Africa, Indonesia, India, and Eastern Europe are used. Cross listed with ANTH 3015. Prerequisites: MUSC 1000 or permission of instructor and WA.

3025. Jazz Theory and Improvisation II. 2. Continuation of Jazz Theory and Improvisation I, MUSC 3020. More advanced topics will be covered and more challenging repertoire will be explored. A strong emphasis will be placed on common practice techniques in mainstream jazz. Prerequisite: MUSC 3020.

3255. Sophomore Qualifying Performance Jury. 0. An extended performance jury at the end of the sophomore year. Music majors may not continue to 4000-level lessons without successful completion of the sophomore jury. Transfer students with junior standing must take the jury at the end of their first semester in residence. Contact your studio teacher for the individual Sophomore Jury requirements. Students may register for this course up to 2

times. Offered satisfactory/unsatisfactory only. Prerequisites: 4 semesters of private instruction, consent of instructor.

3265. Music Education Proficiency Review. 0. This course is required for entrance into upper-division Music Education coursework. The review will assess competency in oral and written communication skills, preliminary teacher performance, sight singing, and error detection. Completion is in the sophomore year or in the first semester for transfer students. Offered satisfactory/unsatisfactory only. Prerequisite: sophomore standing.

3280. Collaborative Piano II. 1-2 (Max 8). Encompasses supervised practice in the art of collaborative piano playing. Discusses traditional usages as applicable to various schools and periods of vocal and instrumental duo literature. Prerequisite: audition required.

3315. Teaching Violin to Children I. 2. This course covers knowledge and skills needed to guide a young violinist's progress through the beginning stages, including preparing students and parents for the first lesson, establishing foundational instrumental skills; developing pulse, pitch and rhythm reading; exploration of Suzuki philosophy and the pedagogy of Rolland; supplemental repertoire and more. Prerequisite: Current enrollment as a Music Education or Music Performance major with violin or viola as the main instrument. Open to freshmen and sophomores with permission of instructor.

3325. Teaching Violin to Children II. 2. TVC 2 goes into more depth about the educational process of the young violinist or violist. Particularly important is the introduction of shifting and vibrato. Opportunities to observe lessons and groups with professional teachers and gain hands on experience by giving 'helper lessons' will be included. Prerequisite: MUSC 3315, current enrollment as a Music Education or Music Performance major with violin or viola as the main instrument. Open to freshmen and sophomores with permission of the instructor.

3380. Wind Ensemble II. 1 (Max. 8). Preparation and performance in a select concert band of the finest in contemporary and classic wind and percussion repertory. Prerequisites: audition required, MUSC 1380 or equivalent and junior standing.

3385. World Music Ensemble. 1 (Max 6). Participate fully in music making in Sikuris de Wyoming, the Wyoming Gamelan Candra Wyoga, or the Laramie Irish tune session. These group music-making opportunities are distinctly different from other leader-focused ensembles offered in the Department of Music. Prerequisites: MUSC 1000 or MUSC 1003.

3390. Jazz Ensemble II. 1 (Max. 8). [(none)◀▶H] Preparation and performance in a select jazz ensemble of the finest in jazz repertoire. *Prerequisites:* audition required, MUSC 1390 or equivalent and junior standing.

3400. Collegiate Chorale II. 1 (Max. 12). [(none)◀▶H] Provide the advanced and committed singer with outstanding performing experiences ranging from major choral masterworks to masterpieces of the *a cappella* tradition, both sacred and secular. The choir is a professional training ensemble and students may be asked to take on leadership roles. Commitment of time to advance the excellence and public awareness of the ensemble will be required. *Prerequisites:* audition required, and junior standing or above.

3405. UW Singing Statesmen II. 1 (Max 12). [(none)◀▶H] Provides all levels of singer with the rich tradition of male ensemble singing. Solidify basic musicianship skills and vocal technique while experiencing camaraderie and service to the region. May be asked to take on leadership roles to advance public awareness. Open to music majors and non-music majors without audition. *Prerequisite:* Junior standing or above.

3407. Happy Jacks II. 1 (Max 12). Student-led male *a cappella* ensemble that sings contemporary, jazz, and traditional repertoire. Upperclass students may be asked to take on leadership roles. Ensemble travels regularly to promote male singing through concerts and school workshops. *Prerequisites:* Audition only. Co-requisite: enrollment in The UW Singing Statesmen.

3411. Vocal Jazz II. 1 (Max 12). Sings standard repertoire from various jazz traditions, often with rhythm section. Focus on building musical skill and literacy in the jazz idiom. Students may be asked to take on leadership roles. *Prerequisites:* Audition required. Junior standing or above.

3415. Bel Canto Women's Chorus II. 1 (Max 12). [(none)◀▶H] Builds community through score study and the development of fundamental musicianship skills, including sight singing, ear training, and vocal technique. May be asked to take on leadership roles. This ensemble is open to music majors and non-music majors without audition. *Prerequisite:* Junior standing or above.

3417. Laramie Civic Chorus II. 1 (Max 12). [(none)◀▶H] Welcomes students, faculty, and community members. Repertoire includes musical works from a multiplicity of style periods and genres in both Western and non-Western traditions and includes regular collaboration with the UW Symphony Orchestra for major

choral works. Students may be asked to take on leadership roles. *Prerequisite:* Junior standing or above; audition required.

3430. Symphony Orchestra II. 1 (Max. 8). [(none)◀▶H] Preparation and performance in a select symphony orchestra of the finest in orchestral repertoire. *Prerequisites:* audition required, MUSC 1430 or equivalent and junior standing.

3440. Chamber Orchestra II. 1 (Max. 8). Devoted to the rehearsal and performance of masterpieces from the chamber orchestra repertoire. Students in the 3440 level of Chamber Orchestra will be expected to have a competent level of proficiency on their parts.

3450. Percussion Ensemble II. 1 (Max. 8). A chamber music ensemble, performing repertoire which encompasses classical percussion literature, ethnic drumming styles, and steel drum ensemble. Designed for the advanced undergraduate who has normally attained a higher level of technical ability in percussion by their junior/senior year. *Prerequisites:* four semesters of MUSC 1450 or equivalent and junior standing.

3460. Brass Ensemble II. 1. The University of Wyoming Brass Ensemble is a course devoted to the rehearsal and performance of masterpieces from the brass chamber repertoire. Students in the 3460 level of Brass Ensemble will be expected to have a competent level of proficiency on their parts and assume leadership roles in the ensemble.

3470. Woodwind Ensemble II. 1 (Max. 8). Preparation and performance in a select woodwind chamber ensemble of the finest standard and contemporary wind ensemble literature. Enrollment is restricted to juniors and seniors. *Prerequisites:* audition required; MUSC 1470, and junior standing.

3480. Chamber Music II. 1. [CA◀▶(none)] Designed to provide students with training in the ideal medium of chamber music (small ensembles, such as trio, string quartet, etc.), where they can apply and integrate all elements of their musical knowledge. These include but not limited to rhythm, intonation, tone-production, blend, musical interpretation, concept of style, etc. *Prerequisites:* consent of instructor; MUSC 1480 and junior standing.

3490. Piano Ensemble II. 1 (Max 8). Training in the medium of piano duo and piano duet repertoire, apply and integrate all elements of musical knowledge. These include but are not limited to rhythm, tone-production, musical interpretation, concept of style, etc. *Prerequisites:* consent of instructor; Audition required. Juniors or Seniors.

3500. Junior Recital. 0. Students will perform a 30 minute (minimum) recital of appropriate repertoire. Consult your studio teacher for individual studio requirements. Offered satisfactory/unsatisfactory only. *Prerequisites:* 4 semesters of private instruction, consent of instructor.

4000. Careers in Music. 2. Expands the student's understanding of the range of careers in the professional music world. Covers the concepts of marketing, performance, teaching, recording, technology, venue management, and fundraising. *Prerequisite:* MUSC 1000 or MUSC 1003.

4020. Jazz Theory and Improvisation III. 2. Continuation of Jazz Theory and Improvisation II, MUSC 3025. Students will learn the harmonic and melodic language of bebop and hard bop through performance and composition of tunes in these idioms. *Prerequisite:* MUSC 3025.

4025. Jazz Theory and Improvisation IV. 2. Continuation of Jazz Theory and Improvisation III, MUSC 4020. Students explore developments in jazz improvisation and composition since 1960. Advanced theoretical concepts are covered in lectures and workshop sessions. *Prerequisite:* MUSC 4020.

4040. Composition. 2 (Max. 12). Encompasses original work in construction of smaller forms. For graduate credit, students must present extra paper or project determined by instructor. *Prerequisite:* MUSC 4010.

4050. Advanced Studies in World Music. 3. Focuses on music-making and cultures of three musical traditions from around the world. *Prerequisite:* MUSC 3015.

4060. Applied Composition Lessons. 1-2 (max. 12). Students meet on a weekly basis with the instructor and work on individual composition projects and exercises. Students will be required to take a juried portfolio examination at the end of the semester to determine, in part, the final grade. *Prerequisite:* Previous training proven with a portfolio/audition or MUSC 4040.

4070. Conducting. 3. Examines basic techniques of baton, score reading, familiarization with standard works, practical experience in directing choral and instrumental groups. For graduate credit, students must present extra paper or project determined by instructor. *Prerequisites:* MUSC 2030, 2035, 2040 and 2045.

4155. Senior Music Education Recital. 0. Music Education students perform a recital which may be a part of a Convocation or a separate performance. Consult your studio teacher for individual studio requirements.

Offered satisfactory/unsatisfactory only. *Prerequisites:* senior standing and studio teacher consent.

4255. Elementary and Secondary Methods: Practicum. 2. Part of Phase IIIa of the music teacher education program. Practicum experience is integral to MUSC 4265 and must be taken concurrently. *Prerequisites:* 2.750 cumulative GPA, successful completion of all music and professional education courses and concurrent enrollment in MUSC 4265. (Offered fall semester)

4265. Elementary and Secondary Music Teaching Methods. 8. [(none)◀COM3] Comprised of content and pedagogy in Music. Must be taken in the same semester as the 2 semester hour course, MUSC 4255. *Prerequisites:* 2.750 minimum cumulative GPA, 2.750 GPA in major, successful completion of all music and professional education courses and concurrent enrollment in MUSC 4255. (Offered fall semester).

4310. Choral Arranging. 2. Teaches working techniques of arranging for the voice in varied combinations of choral ensembles. For graduate credit, students must present extra paper or project determined by instructor. *Prerequisites:* MUSC 2030 and 2035.

4315 [3000]. America's Ethnic Music. 3. [CA,D◀(none)] Surveys music of ethnic groups in America. *Prerequisite:* MUSC 1000.

4330. The Baroque Period. 3. [(none)◀COM3] Studies origins of Baroque literature. For graduate credit, students must present extra paper or project determined by instructor. *Prerequisites:* MUSC 2050 and 2055.

4335. The Classical Period. 3. Encompasses concentrated survey and style analysis of classical period's music. For graduate credit, students must present extra paper or project determined by instructor. *Prerequisites:* MUSC 2050 and 2055.

4340. The Romantic Period. 3. [CA◀COM3] Surveys romantic musical literature. For graduate credit, students must present extra paper or project to be determined by instructor. *Prerequisites:* MUSC 2050 and 2055.

4345. Contemporary Period. 3. Surveys styles and composers of contemporary period. For graduate credit, students must present extra paper or project determined by instructor. *Prerequisites:* MUSC 2050 and 2055.

4350. History and Literature of Jazz. 3. [(none)◀H] Surveys details of American jazz music from the turn of the 20th century to present. Acquaints students with basic jazz materials, techniques and styles, as well as work of selected jazz masters. For graduate credit,

students must present extra paper or project determined by instructor. *Prerequisite:* consent of instructor.

4380. Jazz Techniques. 2 (Max. 2). Surveys jazz structure, styles, techniques and materials with respect to public school music programs. Intended for music education major. *Prerequisite:* MUSC 2035. (Offered spring semester)

4400. Vocal Literature. 1/2-2 (Max. 6). Studies solo materials from Renaissance to present, emphasizing style and interpretation. *Prerequisite:* 4 semester hours of voice.

4455. Elem General Music Methods. 3. This course is designed to prepare students for a career in K-6 music teaching while emphasizing the need for music teachers to recognize diverse student needs, including those unique qualities brought into the classroom by marginalized populations. Restricted to Music Education majors. *Prerequisites:* Completion of MUSC 2040, MUSC 2045 and MUSC 2055. Concurrent enrollment in MUSC 4705.

4460. Choral Music Methods. 3. This course is designed to help pre-professional music educators gain tools for teaching secondary choral music. Topics to be explored include choral literature, methodology involving strengthening musicianship, rehearsal techniques, and issues pertaining to the development of a choral ensemble program. Restricted to Music Education majors. *Prerequisites:* Completion of MUSC 2040, MUSC 2045 and MUSC 2055. Concurrent Enrollment in MUSC 4715 for choral emphasis students.

4465. Instrumental Music Methods. 3. Based on a comprehensive instrumental music education model, this course acquaints students with curriculum development, instructional planning, and materials and techniques designed for teaching musical concepts and skills in instrumental ensemble and class lesson settings. Restricted to Music Education majors. *Prerequisites:* Completion of MUSC 2040, MUSC 2045 and MUSC 2055. Concurrent enrollment in MUSC 4715 for instrumental emphasis students.

4490. History of Rock and Roll. 3. [(none)◀H] This course will examine music styles prior to rock and roll and then delve into the various styles of the music from the 1950s to the late 20th century. In order to understand rock and roll music the course will analyze other styles of popular music in the United States.

4500. Directed Independent Study-Undergraduate. 1-2 (Max. 4). *Prerequisite:* consent of department head.

4510, 4520, 4530, 4560. Applied Music Methods and Materials. Courses taken in the form of private lessons and subject to

similar fees. See individual descriptions below.

Prerequisite: at least 16 semester hours in one performance field and/or consent of instructor.

4510. Brass Instruments. (\$85 Fee) 1 (Max.2).

4520. Organ. (\$85 Fee) 1 (Max. 2).

4530. Piano. (\$85 Fee) 1 (Max. 2).

4560. Voice. (\$100 Fee) 1 (Max. 2).

4590. Senior Recital. 2 (Max. 4). *Prerequisites:* at least 14 semester hours in one performance field and senior standing.

4615. Instrumental Pedagogy. 0.5-2 (Max. 3). Surveys teaching materials in solo and chamber literature, techniques, practices, and methods for applicable instrument. *Prerequisite:* 8 credit hours of individual study in a specific instrument.

4620. Practicum in Music Education. 1. Provides opportunity to gain experience in music classroom in area public schools. Includes work on meeting educational standards of Wyoming necessary to begin student teaching and continued work on developing a teaching portfolio. *Prerequisites:* MUSC 1050 and junior status.

4625 [4600]. Piano Pedagogy. 2 (Max. 2). This specialized course addresses the teaching of piano to children with special emphasis on the development of correct technique, studio teaching techniques, student learning styles, repertoire assignment, and all aspects of establishing a private studio. The last quarter of the class includes an in-class, supervised teaching unit. Dual listed with MUSC 5625. *Prerequisite:* 8 credit hours of piano study.

4635 [4610]. Vocal Pedagogy. 2. This specialized course addresses anatomy and physiology of the vocal instrument and the scientific principles surrounding it, studio teaching techniques, student learning styles, repertoire assignment, and all aspects of establishing a private voice studio. The last quarter of the class includes an in-class, supervised teaching unit. Students enrolled in the graduate level (5635) will undertake an extensive research paper/project and additional teaching. Dual listed with MUSC 5635. *Prerequisite:* 8 credits of voice or permission of instructor. (Offered alternate spring semesters)

4650. Keyboard Literature. 3. An overview of solo ensemble keyboard literature from the 1600s to the present, focusing on major composers and common compositional forms. Includes listening assignments and examinations as well as individual research papers and class presentations. *Prerequisites:* MUSC 2050 and 2055.

4651. String Solo Literature. 3. Provide a survey of the masterpieces of string solo literature (violin,viola, cello and bass literature)

in a historical and musical context. Includes listening assignments and examinations as well as class presentations. *Prerequisites:* 8 hours of lessons in string instruments.

4652. Chamber Music Literature. 3. Provide a survey of the masterpieces of chamber literature in a historical and musical context. Includes listening assignments and examinations as well as class presentations. *Prerequisites:* MUSC 2050 and MUSC 2055 or permission of instructor.

4700. Elementary Student Teaching in Music. 8. The final professional academic semester of the teacher education program. A full-time residency with an elementary mentor teacher. Offered Satisfactory/Unsatisfactory only. *Prerequisites:* 2.750 cumulative GPA, 3.000 GPA in major content courses, completion of all content courses, successful completion of Phase IIIa specific pedagogy and practicum, complete review of the prospective teacher's record.

4705. Elementary Music Ed Practicum. 1. Practicum experience is integral to development as a music teacher. As part of the Music Teaching Methods Sequence, pre-service music teachers will be immersed into authentic elementary and secondary music settings. Restricted to Music Education majors. *Prerequisite:* Concurrent enrollment with MUSC 4455 for instrumental emphasis students.

4710. Secondary Student Teaching in Music. 8. The final professional academic semester of the teacher education program. A full-time residency with a secondary mentor teacher. Offered. Satisfactory/Unsatisfactory only. *Prerequisites:* 2.750 cumulative GPA, 3.000 GPA in major content courses, completion of all content courses, successful completion of Phase IIIa specific pedagogy and practicum, complete review of the prospective teacher's record.

4715. Secondary Music Ed Practicum. 1. Practicum experience is integral to development as a music teacher. As part of the Music Teaching Methods Sequence, pre-service music teachers will be immersed into authentic elementary and secondary music settings. Restricted to Music Education majors. *Prerequisite:* Concurrent enrollment with MUSC 4460 or MUSC 4465.

4750. Marching Band Techniques. 1. Applies specific various drill design techniques including corps style, military, show band and computer applications.

4780. Instrumental Conducting and Repertory. 2. Applies specific basic conducting techniques to instrumental group rehearsals concerning such problems as intonation, phrasing, dynamics, balance, etc. Overviews

appropriate selection procedures for band and orchestral literature. *Prerequisite:* MUSC 4070 and 2395.

4790. Choral Conducting and Repertory. 2. Applies specific basic conducting techniques to choral group rehearsals concerning such problems as intonation, good vocal production, phrasing, diction, dynamics, balance, etc. Overviews appropriate choral literature. *Prerequisite:* MUSC 4070 and passed piano proficiency requirement.

4990. Topics in _____. 1-12 (Max. 12). Encompasses various topics in music. Specific subjects vary from year to year as course is often taught by distinguished visiting artists and lecturers or music faculty. Presents topics of special interest to music majors, graduate students and music educators. Please check class schedule for course titles each semester. *Prerequisite:* consent of instructor.

5010. Mentoring the Pre-Service Music Educator. 1 (Max. 4). Designed for K-12 supervisors of pre-service music teachers, the goal of the course is to provide guidance and theoretical grounding through readings, discussion, journaling, and research projects. Participants will participate in two on-site workshops, weekly tele-conferences and complete a written research project. *Prerequisite:* consent of instructor.

5030. Advanced Theory I. 3. First semester of a one-year course. Analysis of, and practice in, the more recent harmonic idioms with advanced aural and keyboard harmony. *Prerequisite:* MUSC 2030, 2035.

5080. Baritone Horn V. 1-2 (Max. 8). *Prerequisite:* 2-4 semester hours of MUSC 4080 on the same instrument or graduate standing.

5090. Bassoon V. 1-2 (Max. 8).

5100. Cello V. 1-2 (Max. 8).

5110. Clarinet V. 1-2 (Max. 8).

5120. Double Bass V. 1-2 (Max. 8).

5130. Flute V. 1-2 (Max. 8).

5140. French Horn V. 1-2 (Max. 8).

5150. Guitar V. 1-2 (Max. 8).

5160. Harp V. 1-2 (Max. 8).

5170. Oboe V. 1-2 (Max. 8).

5180. Organ V. 1-2 (Max. 8).

5190. Percussion V. 1-2 (Max. 8).

5200. Piano V. 1-2 (Max. 8).

5210. Saxophone V. 1-2 (Max. 8).

5220. Trombone V. 1-2 (Max. 8).

5230. Trumpet V. 1-2 (Max. 8).

5240. Tuba V. 1-2 (Max. 8).

5250. Violin V. 1-2 (Max. 8).

5260. Viola V. 1-2 (Max. 8).

5270. Voice V. 1-2 (Max. 8).

5310. Music Research Methods. 2. Prepares students to be knowledgeable consumers of music and interdisciplinary information.

Topics include the musicology research process, information ethics, and critical analyses and integration of information sources into writing. Information literacy principles and research techniques equip students for both graduate-level music research and the post-graduate, professional world. *Prerequisite:* graduate standing in music.

5315. Advanced Instruction in String Teaching I. 2. This course, designed for graduate students, covers the knowledge and skills needed to guide a young violinist's progress through the beginning stages. Establishing foundational instrumental skills; developing pulse, pitch and rhythm reading; exploration of Suzuki philosophy and the pedagogy of Rolland will be included. Graduate students will be expected to do an in depth exploration of supplemental repertoire, organize a class exploration of string pedagogy and complete a project based on an assigned parenting resource. *Prerequisite:* Current enrollment as a Music Education or Music Performance major with violin or viola as the main instrument.

5320. Advanced Seminar. 2-6 (Max. 6). Such topics as The Music of J.S. Bach, The Chamber Music of Mozart, and Contemporary Music will be pursued and will terminate in oral reports and a research paper. *Prerequisite:* MUSC 5310.

5325. Advanced Instruction in String Teaching II. 2. Designed for graduate students, this semester of NAIS goes into more depth about the educational process of the young violinist or violist. Particularly important is the introduction of shifting and vibrato. Opportunities to observe lessons and groups with professional teachers and gain hand on experience by giving 'helper lessons' will be included. Graduate students will team teach vibrato and give a presentation on parent/child relationships and interactions based on assigned readings. *Prerequisite:* MUSC 5315, current enrollment as a Music Education or Music Performance major with violin or viola as the main instrument.

5340. Advanced Composition. 1-4 (Max. 6). A project course to be conducted by individual appointment with the instructor. The result should be the production of a major work suitable for performance by one of the campus organizations. Evaluation is made by a faculty committee on completion and performance of the composition. *Prerequisite:* 4 hours of MUSC 4040.

5350. Advanced Analysis. 3. Consideration of the analytical techniques of Harder, Piston, and Schillinger for traditional music, of Han-

son and Hindemith for modern tonal music, and of Schoenberg and Reti for serial music. *Prerequisite:* graduate standing in music.

5360. Pedagogy of Theory. 2. Consideration of the subject matter of all undergraduate theory courses, procedures for presenting the material, and analysis and evaluation of texts and methods. *Prerequisite:* graduate standing in music.

5370. Advanced Choral Conducting. 1-2 (Max. 3). The interpretation of well-known oratorios and cantatas; experience in the direction of campus choral groups. *Prerequisite:* MUSC 4070, 4790.

5380. Advanced Instrumental Conducting. 1-2 (Max. 3). Interpretive analysis of instrumental works in large form; experience in the direction of campus performing groups. *Prerequisite:* MUSC 4070, 4780.

5390. Performance Practice and Interpretation. 2. A study of the inherited traditions of correct interpretation and performance as related to the various style periods in music. *Prerequisite:* graduate standing in music.

5400. Independent Study and Research. 1-2 (Max. 6). *Prerequisite:* graduate standing and consent of instructor.

5410. History of Musical Instruments. 2. An investigation of the mechanical evaluation of musical instruments as related to the music written for these instruments. *Prerequisite:* graduate standing in music.

5480. Baritone Horn VI. 1-2 (Max. 8).

5490. Bassoon VI. 1-2 (Max. 8).

5500. Cello VI. 1-2 (Max. 8).

5510. Clarinet VI. 1-2 (Max. 8).

5520. Double Bass VI. 1-2 (Max. 8). Covers appropriate technical and repertory materials in graduate-level double bass. A faculty jury will review each semester's work. *Prerequisite:* graduate standing in music.

5530. Flute VI. 1-2 (Max. 8). Designed to cover appropriate technical and repertory materials in graduate-level flute. A faculty jury will review each semester's work. *Prerequisite:* graduate standing in music.

5540. Guitar VI. 1-2 (Max. 8). Designed to cover appropriate technical and repertory materials in graduate-level guitar. A faculty jury will review each semester's work. *Prerequisite:* graduate standing in music.

5550. Harp VI. 1-2 (Max. 8). Designed to cover appropriate technical and repertory materials in graduate-level harp. A faculty jury will review each semester's work. *Prerequisite:* graduate standing in music.

5560. French Horn VI. 1-2 (Max. 8). *Prerequisite:* 4 semester hours of MUSC 4560 or graduate standing.

5570. Oboe VI. 1-2 (Max. 8). *Prerequisite:* 4 semester hours of MUSC 4570 or graduate standing.

5580. Organ VI. 1-2 (Max. 8). Designed to cover appropriate technical and repertory materials in graduate-level organ. A faculty jury will review each semester's work. *Prerequisite:* graduate standing in music.

5590. Percussion VI. 1-2 (Max. 8). Designed to cover appropriate technical and repertory materials in graduate-level percussion. A faculty jury will review each semester's work. *Prerequisite:* graduate standing in music.

5600. Piano VI. 1-2 (Max. 8). Designed to cover appropriate technical and repertory materials in graduate-level piano. A faculty jury will review each semester's work. *Prerequisite:* graduate standing in music.

5610. Saxophone VI. 1-2 (Max. 8). Designed to cover appropriate technical and repertory materials in graduate-level sax. A faculty jury will review each semester's work. *Prerequisite:* graduate standing in music.

5615. Capstone. 3. Designed to provide a forum to present research in music that fulfills requirements of the Plan B process. Instruction is individualized, but involves cooperative learning opportunities with other students. The student presents the finished product to the class members. Course is restricted to students doing Plan B paper only. *Prerequisite:* Plan B proposal approved by the music department graduate committee.

5620. Trombone VI. 1-2 (Max. 8). Designed to cover appropriate technical and repertory materials in graduate-level trombone. A faculty jury will review each semester's work. *Prerequisite:* graduate standing in music.

5625. Piano Pedagogy. 2 (Max. 2). This specialized course addresses the teaching of piano to children with special emphasis on the development of correct technique, studio teaching techniques, student learning styles, repertoire assignment, and all aspects of establishing a private studio. The last quarter of the class includes an in-class, supervised teaching unit. Dual listed with MUSC 4625. *Prerequisite:* 8 credit hours of piano study.

5630. Trumpet VI. 1-2 (Max. 8). Designed to cover appropriate technical and repertory materials in graduate-level trumpet. A faculty jury will review each semester's work. *Prerequisite:* graduate standing in music.

5635. Vocal Pedagogy. 2. This specialized course addresses anatomy and physiology of the vocal instrument and the scientific principles surrounding it, studio teaching techniques, student learning styles, repertoire assignment, and all aspects of establishing a private voice studio. The last quarter of the

class includes an in-class, supervised teaching unit. Students enrolled in the graduate level (5635) will undertake an extensive research paper/project and additional teaching. Dual listed with MUSC 4635. *Prerequisite:* 8 credits of voice or permission of instructor. (Offered alternate spring semesters)

5640. Tuba VI. 1-2 (Max. 8). Designed to cover appropriate technical and repertory materials in graduate-level tuba. A faculty jury will review each semester's work. *Prerequisite:* graduate standing in music.

5650. Violin VI. 1-2 (Max. 8). Designed to cover appropriate technical and repertory materials in graduate-level violin. A faculty jury will review each semester's work. *Prerequisite:* graduate standing in music.

5660. Viola VI. 1-2 (Max. 8). Designed to cover appropriate technical and repertory materials in graduate-level viola. A faculty jury will review each semester's work. *Prerequisite:* graduate standing in music.

5670. Voice VI. 1-2 (Max. 8). Designed to cover appropriate technical and repertory materials in graduate-level voice. A faculty jury will review each semester's work. *Prerequisite:* graduate standing in music.

5680. Graduate Recital. 2. A recital, vocal or instrumental and consisting of selections of advanced difficulty in matters of technique and interpretation, is presented under the direction of a staff member. Quality and content of recital must be approved by a faculty committee one month before the recital date, and the faculty committee will determine the final grade. *Prerequisite:* graduate standing in music and consent of instructor.

5690. Advanced Teaching Methods - Brass. 1. Designed to present new and improved methods of teaching the various band and orchestral instruments in the public schools.

5700. Advanced Teaching Methods - String. 1. Designed to present new and improved methods of teaching the various band and orchestral instruments in the public schools.

5710. Advanced Teaching Methods - Woodwind. 1. Designed to present new and improved methods of teaching the various band and orchestral instruments in the public schools.

5720. Musical Supervision: Choral. 2. Examination of the administrative responsibilities of the music teacher, the music department chairman, and the district music supervisor in the public schools, as well as the responsibilities of a music festival chairman and officers of the state music educators association. *Prerequisite:* graduate standing in music.

5730. Musical Supervision: Instruments. 2. Examination of the administrative responsibilities of the music teacher, the music department chairman, and the district music supervisor in the public schools, as well as the responsibilities of a music festival chairman and officers of the state music educators association. *Prerequisite:* graduate standing in music.

5760. Music Education Seminar. 2. A study and discussion of trends, objectives, and curricula of the various phases of music education.

5770. Marching Band. 0.5 (Max. 2).

5780. Wind Ensemble III. 0.5 (Max. 2). One of the elite ensembles in the Department of Music, Wind Ensemble offers participants the opportunity to prepare and perform some of the finest, most technically challenging, contemporary and classic wind and percussion repertoire. *Prerequisites:* graduate or Performer's Certificate students, audition required.

5790. Jazz Ensemble III. 0.5 (Max. 2). Preparation and performance in a select jazz ensemble of the finest in standard jazz ensemble repertoire and contemporary compositions by living jazz artists. Enrollment is restricted to graduate and Performer's Certificate students only. *Prerequisites:* audition required.

5800. Collegiate Chorale III. 0.5 (Max. 12). Provide the advanced and committed singer with outstanding performing experiences ranging from major choral masterworks to masterpieces of the *a cappella* tradition, both sacred and secular. The choir is a professional training ensemble and students may be asked to take on active musical leadership roles. Commitment of time to advance the excellence and public awareness of the ensemble will be required. *Prerequisites:* audition required, and graduate standing.

5805. The UW Singing Statesmen III. 0.5 (Max 12). The UW Singing Statesmen provides all levels of singers with the rich tradition of male ensemble singing. Students will solidify basic musicianship skills and vocal technique while experiencing camaraderie and service to the region. Students may be asked to take on music leadership roles and advance the excellence and public awareness of the ensemble. Open to music majors and non-music majors without audition. *Prerequisite:* Graduate standing.

5807. Happy Jacks III. 0.5 (Max 12). Student-led male *a cappella* ensemble that sings contemporary, jazz, and traditional repertoire. The ensemble travels regularly to promote male singing through concerts and school workshops. Students may act as musical director. Audition only. Co-requisite: enrollment in The UW Singing Statesmen. *Prerequisites:* Audition required. Graduate standing.

5811. Vocal Jazz III. 0.5 (Max 12). Sings standard repertoire from various jazz traditions, often with rhythm section. Focus on building musical skill and literacy in the jazz idiom. Students may be asked to take on leadership roles. Audition only. *Prerequisites:* Audition required. Graduate standing.

5815. Bel Canto Women's Chorus III. 0.5 (Max 12). Builds community through score study and the development of fundamental musicianship skills, including sight singing, ear training, and vocal technique. Students may be asked to take on leadership roles. This ensemble is open to both music majors and non-music majors without audition. *Prerequisite:* Graduate standing.

5817. Laramie Civic Chorus III. 0.5 (Max 12). Welcomes students, faculty, and community members. Repertoire includes musical works from a multiplicity of style periods and genres in both Western and non-Western traditions and includes regular collaboration with the UW Symphony Orchestra for major choral works. Students may be asked to take on leadership roles. *Prerequisite:* Graduate standing; audition required.

5820. Opera Theatre. 0.5 (Max. 2).

5830. Symphony Orchestra III. 0.5 (Max. 2). The premier orchestral ensemble in the Department of Music. Participation in this ensemble prepares students to perform some of the great symphonic literature from a wide variety of musical periods. *Prerequisites:* graduate or Performer's Certificate students; audition required.

5840. Chamber Orchestra. 0.5-1. (Max. 2). Devoted to the rehearsal and performance of masterpieces from the chamber orchestra repertoire. Students in the 5840 level of Chamber Orchestra will be expected to assume leadership roles within the ensemble, help with bowings, lead sectionals and be highly proficient on their individual parts.

5850. Percussion Ensemble. 0.5 (Max. 2).

5860. Brass Ensemble III. 0.5 (Max. 2). The University of Wyoming Brass Ensemble is a course devoted to the rehearsal and performance of masterpieces from the brass chamber repertoire. Students in the 5860 level of Brass Ensemble will be expected to have a high level of proficiency on their parts and assume leadership roles within the ensemble.

5870. Woodwind Ensemble III. 0.5 (Max. 2). Preparation and performance in a select woodwind chamber ensemble of the finest standard and contemporary wind ensemble literature. *Prerequisites:* graduate or Performer's Certificate students; audition required.

5880. Chamber Music III. 0.5 (Max. 2). Designed to provide students with training in the ideal medium of chamber music (small ensembles, such as trio, string quartet, etc.), where they can apply and integrate all elements of their musical knowledge. These include but are not limited to rhythm, intonation, tone-production, blend, musical interpretation, concept of style, etc. *Prerequisites:* graduate or Performer's Certificate students; audition required.

5885. Collaborative Piano III. 1-2 (Max. 8). Encompasses supervised practice in the art of collaborative piano playing. Discusses traditional usages as applicable to various schools and periods of vocal and instrumental duo literature. *Prerequisites:* Audition required; MUSC 3280 or equivalent and graduate standing.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5961. Plan B Paper/Plan B Lecture-Recital. 0. Plan B Paper/Plan B Lecture-Recital. Required capstone for the MM degree. Satisfactory/Unsatisfactory only.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

Department of Philosophy and Religious Studies

Philosophy

122 Ross Hall, (307) 766-3204

Web site: www.uwyo.edu/philosophy

E-mail: philosophy@uwyo.edu

Department Head: Susanna L. Goodin

Professors:

HARVEY HIX, B.A. Belmont College 1982; M.A. University of Texas, Austin 1985; Ph.D. 1987; Professor of Philosophy and Creative Writing 2013.

JEFFREY A. LOCKWOOD, B.S. New Mexico Institute of Mining and Technology 1982; Ph.D. Louisiana State University 1985; Professor of Philosophy and Creative Writing 2006.

Associate Professors:

SUSANNA L. GOODIN, B.A. Texas Technical University 1981; M.A. Rice University 1985; Ph.D. 1990; Associate Professor of Philosophy 1998, 1992.

FRANZ-PETER GRIESMAIER, University of Vienna 1986; M.A. University of Colorado 1988; Ph.D. University of Arizona 1997; Associate Professor of Philosophy 2006, 2000.

EDWARD D. SHERLINE, B.A. Princeton University 1982; M.A. University of Chicago 1983; Ph.D. University of Illinois-Chicago 1990; Associate Professor of Philosophy 1996, 1989.

Assistant Professor:

BRADLEY RETTLER, B.S. Crown College 2004; M.A. Biola University 2008; Ph.D. University of Notre Dame 2014; Assistant Professor of Philosophy 2018.

Academic Professional Lecturer:

ROBERT S. COLTER, B.A. The University of Puget Sound 1992; M.A. University of Colorado 1995; Ph.D. Northwestern University 2001; Academic Professional Lecturer 2013, 2007.

Professors Emeriti:

James Forrester, Richard L. Howey, James A. Martin

Philosophy starts with those hard questions we all ask at some time or another. Some important questions of meaning and justification can't be answered by making observations or doing experiments. Philosophy is the effort to deal with these problems through sustained, hard, and critical thinking. Philosophy is good preparation for careers that call for you to use your mind, without prejudice but with rigor.

The Philosophy Department offers an undergraduate major, three undergraduate minors, and a graduate MA.

For details on each of these programs, see the department's web site.

Undergraduate Major

B.A. Program of Study in Philosophy

General requirements:

- A major in philosophy requires a minimum of 33 hours (11 courses) of philosophy.
- At least 9 hours (3 courses) must be at or above the 4000-level.

- At least 15 additional hours (5 courses) must be at or above the 3000-level. The remaining nine hours (3 courses) may be at any level.
- **Only those courses in which a grade of C or better has been earned may count toward the 33-hour requirement.**

The department strongly recommends that prospective majors take PHIL 1000, Introduction to Philosophy, as their first course in philosophy.

Distribution Requirements

Students must choose three of the four distribution areas and take at least 6 hours (2 courses) in each of the chosen areas, including at least one core course in each chosen area. The distribution areas are:

- *Metaphysics and epistemology:*
PHIL 2310, 3440, 3510, 3560, 4040, 4120, 4190, 4440, 4510, 4560.
- *Ethics and philosophy of value:*
PHIL 2200, 2300, 2330, 2345, 3250, 3300, 3350, 4300, 4340.
- *Logic and philosophy/history of science:*
PHIL 2420, 3140, 3420, 3500, 4140, 4420.
- *History of philosophy:* PHIL 2100, 3100, 3110, 3120, 3220, 3320, 4020, 4030, 4040, 4100, 4110.

Special topics courses (for example, PHIL 3000, PHIL 4000) are assigned to the appropriate distribution area on a case by case basis. And some of the courses listed above, especially the graduate seminars in area 4, might count in other distribution areas. To work out a suitable program, please consult with the department's undergraduate adviser.

The general level requirement and distribution requirement may be satisfied by the same courses. That is, a course may satisfy both of these requirements at the same time. No course may satisfy more than one distribution area, and no course may satisfy more than one general level requirement.

The department allows its majors to concentrate in a number of interdisciplinary areas, and we welcome double-majors in philosophy and another field. Please consult the department's undergraduate adviser to work out a suitable program.

Minor in Philosophy

The minor in philosophy affords students the benefits, both personal and professional, of studying philosophy.

A student minoring in philosophy must earn a C or better in six philosophy courses, including four at the 3000-level or higher. No specific courses (other than the four courses at the 3000-level or higher) are required, allowing students to take the courses that most align with their interests.

Minor in Ethics

Ethical questions and problems arise in all aspects of life. A minor in ethics can complement and enrich any major field of study. The minor in ethics consists of six courses, four at the 3000 level or above. A student takes one course in each of these areas: ethical theory (PHIL 3300 Ethical Theory, PHIL 3350 History of Moral Philosophy, PHIL 3250 Global Justice); applications (determined on a course by course basis in consultation with the Philosophy Department Undergraduate Advisor); scientific, historical and social analysis (determined on a course by course basis in consultation with the Philosophy Department Undergraduate Advisor), and capstone course (determined in consultation with the Philosophy Department Undergraduate Advisor). The other two courses are approved electives, (2 courses from Areas 1, 2 or 3 -- each from a different area).

The capstone course is an independent study normally taken during a student's senior year. The course integrates the student's different areas of study in the ethics minor into a project or thesis. Any professor in any college can sponsor this independent study. Capstone topics must be approved by the ethics minor advisor.

The minor in ethics is sponsored by the College of Arts and Sciences and administered through the Philosophy Department. Any undergraduate student at the university can minor in ethics.

Minor in Environmental Values

The minor in Environmental Values may be added to any bachelor's program at UW. This minor creates a vital link among the natural sciences, humanities, and social sciences through exploration of aesthetics, culture, ethics, and policy.

The minor requires a total of 18 credit hours, including at least one course within each of four areas of concentration. At least 12 of these credits must be outside the primary major, and nine of these credits must be at or above the 3000-level. A three-hour, core course (either PHIL 2330 Environmental Ethics or PHIL 2340 Natural Resource Ethics) is required of all students.

Areas of concentration: (note: the courses listed below are provided as examples of the type of courses that meet the various areas of concentration. Other courses may be approved on a course by course basis in consultation with the Philosophy Department Undergraduate Advisor.)

- **Aesthetics** - Expressing ourselves through the performing, visual and literary arts: ART 4640, ENGL 4050, ENGL 4240, GEOG 4500, GEOG 4530, THEA 2400, THEA 3400.
- **Culture** - Viewing human meaning and purpose in historical and contemporary terms: NAIS 3000, AMST 3000, ANTH 4310, ENGL 3400, ENGL 4480, ENR 2000, ENR 3050, GEOG 1050, HIST 4475, PHCY 4380.
- **Ethics** - Considering right and wrong via critical and systematic thinking and doing: PHIL 2330, PHIL 2345, PHIL 3250, PHIL 3300, PHIL 3350, PHIL 4340, RELI 2060.
- **Policy** - Exploring laws, regulations, and public discourse in American society: AGE 4710, NAIS 4340, ECON 2400, ENR 4900, GEOG 4040, GEOG 4400, MGT 4580, POLS 4051, POLS 4052.

Graduate Study

The Department of Philosophy offers the master of arts degree under the Plan A or Plan B.

Program Specific Admission Requirements

A writing sample of no more than 3,000 words on any subject in philosophy.

A statement describing specific philosophical interests.

Program Specific Graduate Assistantships

The department offers two to three graduate assistantships yearly on a competitive basis. These assistantships carry a tuition and fee waiver, plus a stipend. For more information, please contact the department.

Program Specific Degree Requirements

Plan A (thesis)

31 hours of graduate credit
27 hours of graduate coursework
4 hours of thesis research

Proof of proficiency in formal logic (through first-order predicate logic with identity) by either passing the department's course (3420) or some other course judged to be its equivalent with a grade B or better or by completing a test with a grade B or better at the end of the second semester.

First year paper at the beginning of the third semester.

Defense of a thesis prospectus by the end of the third semester.

In any cases of deficiency, the department may require remedial work before admission to M.A. candidacy.

Philosophy (PHIL)

Philosophy majors may not take any philosophy course for S/U credit without written permission from the department head.

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1000. Introduction to Philosophy. 3. [CH▶▶H] Introduces critical thinking through a study of elementary logic, scientific method and philosophical problems of ethics, religion, epistemology and metaphysics.

1101. First-Year Seminar. 3. [(none)▶▶FYS]
2100. The Greek Mind. 3. [CH▶▶(none)] Part one of the history of philosophy sequence. The first great age of philosophy was in ancient Greece. Students read from ancient Greek poets, historians and medical writers, as well as philosophers. The course attempts to understand the Greek mind: what Greeks thought of persons, society and the universe. *Prerequisite:* 3 hours of philosophy.

2300. Ethics in Practice. 1-3 (Max. 6). [CH▶▶H] Alerts preprofessional students and other interested individuals to various ethical issues they will encounter and relevant professional work on those issues. Emphasis of the course concentrates one time on biomedical ethics, another on technology and engineering ethics, another on ethics in the professions.

2310. Philosophy of Religion. 3. [CH▶▶(none)] Systematically examines philosophical questions, arguments and theories arising from study of religion. Topics may include: reason and religion; the existence and nature of God; the character of religious language; and attempts to determine the authenticity of religious experience. *Prerequisite:* 3 hours of philosophy.

2330. Environmental Ethics. 3. [CH▶▶(none)] Introduction to ethical theory in environmental problem cases, and to philosophical issues in environmental phi-

losophy. Ethical theories include natural law, utilitarianism, deontological and rights-based theories, relativism. Topics may include: conservation/preservation, resource management, pollution, overpopulation, factory farming, Leopold's land ethic, deep ecology, holism, eco-feminism. Cross listed with ENR 2330.

2345. Natural Resource Ethics. 3. [CH,D▶▶H] Introduction to ethics in context of natural resource extraction, use, conservation, preservation, and distribution. Ethical frameworks include teleological and deontological theories primarily applied to human needs and wants. Concepts and applications of environmental justice are addressed, including private property, sustainability, and obligations to future generations. Cross listed with ENR/RNEW 2345.

2420 [1100]. Critical Thinking. 3. [CH▶▶(none)] Shows that argument is a skill of fundamental importance to any field of endeavor. Explains methods used in evaluating an argument. Introduces such topics as: patterns of reasoning, counterexamples, fallacies; inductive and deductive logic.

3000. Special Topics. 3 (Max. 9). Provides undergraduates with the opportunity for in-depth discussion of seminal works in the history of philosophy or a problem in contemporary philosophy not offered in regular courses or independent study. Open to interested undergraduates from all majors. *Prerequisite:* 3 hours of philosophy.

3100. History of Modern Philosophy: The Rationalists. 3. The second great age of philosophy absorbed the influence of the new science during the 17th and 18th centuries. People to be studied include: Descartes, Spinoza and Leibniz. *Prerequisite:* 3 hours of philosophy.

3110. History of Modern Philosophy: The Empiricists. 3. People to be studied include: Locke, Berkeley, Hume and Kant. These philosophers are included in the second great age of philosophy. *Prerequisite:* 3 hours of philosophy, or consent of instructor.

3120. Ancient Greek Philosophy. 3. Surveying some of ancient Greek philosophy. Begins with the works of the earliest extant philosophical thinkers, the presocratics. Remainder of focus on Plato and Aristotle. *Prerequisite:* 3 hours of philosophy, or consent of instructor.

3140. Philosophy of Science. 3. Systematically examines philosophical problems about the nature of science, its methods of explanation, and the status of its laws and theories. *Prerequisite:* 6 hours of physical, biological or social science, or consent of instructor.

3160. "What Killed Socrates?". 3. This course will reexamine Socrates' trial in 399 BCE, widely regarded as a miscarriage of

justice, in its total historic context, seeking to understand the reasons for Socrates' conviction. In the process, it will impart a broad understanding of the cultural, philosophical, political, and legal life of classical Athens. Cross listed with CLAS/HIST 3160. *Prerequisite:* WB or COM2.

3220. Existentialism and Phenomenology. 3. Examines fundamental perspectives of existentialist thought, beginning with its roots in Kierkegaard and Nietzsche. Looks at a large variety of existentialist perspectives presented by Sartre, Heidegger, Buber, Jaspers and Camus. Considers the relation of Husserl's phenomenological method to existentialism. *Prerequisite:* 3 hours of philosophy.

3250. Global Justice. 3. [G◀(none)] An examination of global justice, normative international relations, and international ethics, using the methodology and theories of analytical political philosophy. Possible topics include global economic justice and world poverty, human rights, humanitarian duties, intervention and sovereignty, cosmopolitanism, nationalism, patriotism, world hunger, and immigration. *Prerequisite:* 3 hours of philosophy or international studies.

3300. Ethical Theory. 3. A philosophical investigation of such concepts as morality, obligation, goodness, freedom and responsibility, and of recurring types of ethical theory. *Prerequisite:* 3 hours of philosophy.

3320. Eastern Thought. 3. Surveys some of the major concepts in Zen, Hinduism, Buddhism, Taoism and Confucianism. Cross listed with RELI 3320. *Prerequisite:* 3 hours of philosophy, or consent of instructor.

3340 [2340]. Philosophy in Literature. 3 (Max 6). Examines central themes in literary works with philosophical significance; studies related general issues. Issues include questions of interpretation, criticism, and translation, as well as the possibility of direct philosophical influence on authors. Cross listed with ENGL 3340. *Prerequisite:* one course in philosophy or one course in literature or consent of instructor.

3350. History of Moral Philosophy. 3. A historical and philosophical overview of ethical theory ranging from ancient Greek ethics to the present. *Prerequisite:* 3 hours of philosophy.

3420. Symbolic Logic. 3. Studies both propositional and quantificational logic, concentrating on methods of proof. Takes up such topics as identity, singular terms, intuitive set theory, and translating English sentences into symbolic notation. *Prerequisite:* 3 hours of philosophy, or consent of instructor.

3440. Philosophy of Mind. 3. Considers topics in philosophy of mind, including the mind-body problem, emotions, attitudes, perception and psychological explanation. *Prerequisite:* 3 hours of philosophy, or consent of instructor.

3500. History of Science. 3. Historic and philosophic survey of the development of science from the ancient Greeks to the 20th century. *Prerequisites:* 3 hours of laboratory science and 3 hours of philosophy, or consent of instructor.

3510. Introduction to Epistemology. 3. Systematic introduction to epistemology, the philosophical study of knowledge and justified belief. Aims to answer questions such as: What are the necessary and sufficient conditions of knowledge? What are its sources? What is its structure, and what are its limits? How we are to understand the concept of justification? *Prerequisite:* 3 hours of philosophy, or consent of instructor.

3560. Introduction to Metaphysics. 3. A systematic introduction to metaphysics, the branch of philosophy concerned with providing a comprehensive account of the most general features of reality as a whole. Of central importance is the study of ontology, which seeks to address the question of what general sorts of things exist: particulars, universals, propositions, numbers, minds. *Prerequisite:* 3 hours of philosophy, or consent of instructor.

3933. African Philosophy. 3. [(none)▶H] Examines the work of philosophers of Africa, of African descent and others who deal with the African diaspora. Topics include the nature of African philosophy and the African American struggle, African colonialism, philosophy, political philosophy and gender, traditional African thought. Restricted to junior or senior class standing. Cross listed with AAST/INST 3933. *Prerequisite:* a prior course in either African American and Diaspora Studies, Global and Area Studies, or Philosophy, or consent of instructor.

4000. Philosophical Issues. 1-3 (Max. 6). Dual listed with PHIL 5000. *Prerequisite:* consent of instructor.

4020. Plato. 3. Detailed examination of selected dialogues of Plato. Dual listed with PHIL 5020. *Prerequisite:* PHIL 3120.

4030. Aristotle. 3. Detailed examination of selected works of Aristotle. Dual listed with PHIL 5030. *Prerequisite:* PHIL 3120.

4040. Kant. 3. An examination of one or more aspects of the work of Immanuel Kant, conducted either from the perspective of the history of philosophy, or predominantly as a critical study. *Prerequisite:* 12 hours of philosophy including PHIL 3100 or 3110.

4110. Figures in Contemporary Philosophy. 3-6 (Max. 6). An advanced study of the work of one, or several related, contemporary philosophers. *Prerequisite:* 12 hours of philosophy including PHIL 3100.

4120 [4100]. Philosophy and the 20th Century. 3. Part three of the history of philosophy sequence. Covers the third great age of philosophy. Studies the main ways in which philosophy has been done since 1900. Topics normally include logic and philosophy, Wittgenstein, logical positivism and current trends. Dual listed with PHIL 5120. *Prerequisite:* 12 hours of philosophy including either PHIL 3100, 3110, or 3120.

4130. Figures in Modern and 19th Century Philosophy. 3. A detailed examination of one or more of the figures in modern or 19th century philosophy. Dual listed with PHIL 5130. *Prerequisite:* 9 hours of philosophy including PHIL 3100 or PHIL 3110.

4140. Topics in Philosophy of Science. 3 (Max. 6). Encompasses selected topics in philosophy of science. Dual listed with PHIL 5140. *Prerequisite:* 9 hours of philosophy including PHIL 3140.

4190. Philosophy of Language. 3-6 (Max. 6). An advanced study of the work of one, or several related, contemporary philosophers. Dual listed with PHIL 5190. *Prerequisite:* 12 hours of philosophy including PHIL 4510 or 4560.

4300. Topics in Ethics. 3-6 (Max. 6). An advanced investigation of selected topics in ethics. Examples include derivative and basic principles of obligation; justice; morality and utility; generalization of norms; and the relation of morality and law. Dual listed with PHIL 5300. *Prerequisite:* 12 hours of philosophy including PHIL 3300 or 3350.

4340. Issues in Environmental Ethics. 3. Encompasses selected topics in environmental and natural resource ethics. Dual listed with PHIL 5340. *Prerequisites:* PHIL 2330, 2345, 3300 or 3350.

4420. Advanced Logic. 3. Studies advanced topics in mathematical logic. Takes up such topics as: uninterpreted calculi and the distinctive contributions of syntax and semantics; metatheory, including completeness and consistency proofs; modal logic and semantics; logic as a philosophical tool. Dual listed with PHIL 5420; cross listed with COSC/MATH 4420. *Prerequisite:* PHIL 3420 or equivalent.

4440. Topics in Philosophy of the Mind. 3-6 (Max. 6). An advanced study of problems in the philosophy of mind such as the concept of human action; intention, choice, reasons and causes in the explanation of human action, mental states and brain states, and artificial

intelligence. Dual listed with PHIL 5440. *Prerequisite:* 12 hours of philosophy including PHIL 3440.

4510. Theory of Knowledge. 3. Studies such problems as knowledge and belief, skepticism, perception and knowledge, memory, truth and justification of induction. Dual listed with PHIL 5510. *Prerequisite:* 12 hours of philosophy including PHIL 3510.

4560. Metaphysics. 3. Examines approaches to metaphysics. Discusses problems such as causality, individuation and the distinction between particulars and universals. Dual listed with PHIL 5560. *Prerequisites:* 12 hours of philosophy including PHIL 3560.

5000. Philosophical Issues. 1-3 (Max. 6). Dual listed with PHIL 4000. *Prerequisites:* graduate status and consent of instructor.

5020. Plato. 3. Detailed examination of selected dialogues of Plato. Dual listed with PHIL 4020. *Prerequisite:* graduate standing.

5030. Aristotle. 3. Detailed examination of selected works of Aristotle. Dual listed with PHIL 4030. *Prerequisite:* graduate standing.

5040. Kant. 3. An examination of one or more aspects of the work of Immanuel Kant, conducted either from the perspective of the history of philosophy, or predominantly as a critical study. Dual listed with PHIL 4040. *Prerequisite:* graduate standing.

5120. Philosophy and the Twentieth Century. 3. Part three of the history of philosophy sequence. Covers the third great age of philosophy. Studies the main ways in which philosophy has been done since 1900. Topics normally include logic and philosophy, Wittgenstein, logical positivism and current trends. Dual listed with PHIL 4120. *Prerequisite:* graduate standing.

5130 [5100]. Figures in Modern and 19th Century Philosophy. 3. A detailed examination of one or more of the figures in modern or 19th century philosophy. Dual listed with PHIL 4130. *Prerequisite:* graduate standing or consent of instructor.

5140. Topics in Philosophy of Science. 3-6 (Max. 6). Encompasses selected topics in philosophy of science. Dual listed with PHIL 4140. *Prerequisite:* graduate standing.

5190. Philosophy of Language. 3-6 (Max. 6). An advanced study of the work of one, or several related, contemporary philosophers. Dual listed with PHIL 4190. *Prerequisite:* graduate standing.

5300. Topics in Ethics. 3-6 (Max. 6). An advanced investigation of selected topics in ethics. Examples include derivative and basic principles of obligation; justice; morality and

utility; generalization of norms; and the relation of morality and law. Dual listed with PHIL 4300. *Prerequisite:* graduate standing.

5340. Issues in Environmental Ethics. 3. Encompasses selected topics in environmental and natural resource ethics. Dual listed with PHIL 4340. *Prerequisite:* graduate standing.

5420. Advanced Logic. 3. Studies advanced topics in mathematical logic. Takes up such topics as: uninterpreted calculi and the distinctive contributions of syntax and semantics; metatheory, including completeness and consistency proofs; modal logic and semantics; logic as a philosophical tool. Dual listed with PHIL 4420; cross listed with COSC/MATH 5420. *Prerequisite:* graduate standing.

5440. Topics in the Philosophy Of Mind. 3-6 (Max. 6). An advanced study of problems in the philosophy of mind such as the concept of human action; intention; choice; reasons and causes in the explanation of human action; mental states and brain states; and artificial intelligence. Dual listed with PHIL 4440. *Prerequisite:* graduate standing.

5510. Theory of Knowledge. 3. Studies such problems as knowledge and belief, skepticism, perception and knowledge, memory, truth and justification of induction. Dual listed with PHIL 4510. *Prerequisites:* graduate standing.

5550. Independent Study. 1-6 (Max. 6). A study of a topic selected in consultation with the instructor. *Prerequisite:* graduate standing.

5560. Metaphysics. 3. Examines approaches to metaphysics. Discusses problems such as causality, individuation and distinction between particulars and universals. Dual listed with PHIL 4560. *Prerequisites:* graduate standing.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes. *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for

students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

Religious Studies

122 Ross Hall, (307) 766-3204

Web site: www.uwyo.edu/relstds

Email: relstudies@uwyo.edu

Department Head: Susanna L. Goodin

Program Director: Paul V.M. Flesher

Professor:

PAUL V. M. FLESHER, B.A. University of Rochester 1979; M.Phil. Oxford University 1982; Ph.D. Brown University 1988; Professor of Religious Studies 2012, 1993.

Visiting Assistant Professor

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Senior Academic Professional Lecturer:

SETH WARD, B.A. Yale University 1974; M.A. 1978; M.Phil. 1979; Ph.D. 1984; Senior Academic Professional of Religious Studies 2017, 2003.

Associate Academic Professional

Lecturers:

TYLER S. FALL, B.A. Mary Washington College 1999; M.A. University of Oregon 2004; M.F.A. University of Wyoming 2009; Associate Academic Professional Lecturer of Religious Studies 2017, 2012.

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Adjunct Faculty:

ERIN ABRAHAM, B.A. University of Wyoming 2004; M.A. 2007; Ph.D. Saint Louis University 2011; Assistant Academic Professional Lecturer of Honors Program 2011; Adjunct Assistant Academic Professional Lecturer of Religious Studies 2015.

Professor Emerita:

Kristine T. Utterback

Throughout history, religion has played an important role in shaping cultures and societies. Religious beliefs have inspired armies in their wars and leaders in their decisions. Religions have provided the foundation for ethical behavior and in many societies have been the primary source of education. In today's world, religions remain important, influencing our responses to 9/11, the Arab Spring, the

Middle East crisis, and other events in regions around the world. Even in our own secular United States, religions and their beliefs play a major role in our debates over public policy.

The Religious Studies department offers a range of courses in the academic study of religions. These courses seek to acquaint students with religious beliefs and behavior, helping them to understand the ability of religions to define the world in which their adherents live and the power religions have to influence the behavior of their followers. Religious Studies courses cover a broad range of religions, both modern and historical. Some courses focus on understanding a single religion in a limited time period, while others compare aspects of different religions. Yet further courses focus on religious expression, studying how religious beliefs are depicted in literature, film, art and music. Many of these courses are offered by the Religious Studies department, while others can be found in various departments, including anthropology, art, English, history and sociology.

Undergraduate Major

A major in Religious Studies requires 33 hours (11 courses) plus a second major or minor in another discipline.

For students completing their degree under the 2015 University Studies Program:

Two required courses (6 hours):

- 1) RELI 1000, Introduction to Religion.
- 2) RELI 4000, Theories of Religion.

Concurrent Concentration I (9 hours):

Students should acquire a focused concentration by taking three courses (1) on a single religion, or (2) on the religions of a particular region or culture. Courses may be from a limited time period or spread across history. Students may choose from established concentrations or create their own concentration in consultation with their adviser. [Six hours must be above 3000-level.]

Concurrent Concentration II (9 hours):

Students should take three courses in a religion, region, or culture differing significantly from that of the first concentration. [Six hours must be above 3000-level.]

Electives

Three courses in Religious Studies (see note 2 below) chosen in accordance with the student's interests. [Six hours must be above 3000-level.]

Language

Students should take three semesters of a single foreign language or demonstrate equivalent proficiency. See note 3 below.

Other

Minor or second major in a different field/discipline.

For all Religious Studies Majors:

Honors

If a student wishes to pursue an Honors designation in Religious Studies, two additional requirements must be fulfilled.

A) A three-hour Thesis Seminar or Internship, during which a research paper is written, or other suitable research project is carried out.

B) Demonstration of competency in a foreign language equivalent to a fourth-semester college-level course.

Notes:

1. If students majoring in Religious Studies can use its courses to satisfy requirements in a second major or minor, this is permitted.
2. Courses for the major should be drawn from those with a RELI prefix, or from a list of approved courses taught by other departments or programs. See the list of approved courses on the Religious Studies website. In each of the concentrations, only one course may be from outside RELI offerings. Two such courses may be used as electives. Occasionally, courses on religion are taught by outside departments as one-time opportunities. Students may propose these for inclusion in the major to the director of the Religious Studies department.
3. The language requirement may be satisfied with American Sign Language (ASL) or, with the approval of the department, coursework in another form of non-English communication (e.g. computer science, statistics, music composition).
4. All courses must be passed with a grade of C or better.

Undergraduate Minor

The Minor in Religious Studies requires eighteen hours of relevant courses, all with a grade of "C" or higher. These should consist of courses as set out below:

1. RELI 1000, Introduction to Religion
2. RELI 4000, Theories of Religion, a capstone course.

3. Twelve hours of courses focusing on issues in the study of religions, nine of which should be at the 3000 level or higher. See note 2.

Graduate Study

At present, no program for a graduate degree in religious studies is offered; however, some courses may be counted at the graduate level.

Religion (RELI)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1000. Introduction to Religion. 3. [CH,G◀▶H] Introduces world religions and shared characteristics. Draws on various academic approaches to religion study, emphasizing similarities and differences among wide variety of religions.

1101. First-Year Seminar. 3. [(none)◀▶FYS]
2040. Religions of the Middle East: Judaism, Christianity and Islam. 3. [CH,G◀▶(none)]
 Analyzes origins and early years of three major religions that arose in the Middle East: Judaism, Christianity and Islam. Looks at historical development, political and cultural context, and structure of each religion.

2050. Religions of Asia. 3. [CH,G◀▶H]
 Introduces students to the religions of Asia. Primary focus on Hinduism and Buddhism, but also addresses several smaller religions. Emphasis on beliefs, sacred texts and tales, practices, ethics and worship, as well as historical development and contemporary issues.

2070. Gender and Religion. 3. Aims at understanding how religion constructs and reinforces gender roles in religion and society. Looks at traditional gender roles in Christianity and the transformation they have undergone in the past century or so. Cross listed with WMST 2070.

2080. Holocaust. 3. [CH◀▶(none)] Surveys the destruction of European Jewry, 1933-1945. Cross listed with HIST 2080.

2110 [1010]. Introduction to the Old Testament. 3. [CH◀▶H] Introduces students to the books of the Old Testament and people whose way of life they describe. Pays particular attention to religion of the Israelites, their history and culture. Focuses on different historical circumstances in which the books were written.

2150. New Testament Survey. 3. [(none)◀▶H] Introduces the academic study of the New Testament. Concentrates on the analysis of Jesus, Paul and other New Testament figures by studying the textual evidence

within its historical, religious and cultural contexts. Key foci also include the composition of the New Testament's books and the theological development of early Christianity.

2175. The Life and Teaching of Jesus. 3. Explores life and teachings of Jesus within religious, cultural and political context of first-century Palestine. Studies Jewish, Greek and Roman influences on Palestine; then, examines effect of those influences on the gospels (both canonical and non-canonical).

2200. Contemporary American Religion. 3. [CH,D◀COM2] The U.S. is home to more world religions and to more versions of those religions than any other nation on the planet. This course examines how the U.S. has shaped these religions and the impact these religions have had in turn on U.S. society and culture.

2225. History of Christianity. 3. Traces Christianity from its beginnings to late 20th century. Cross listed with HIST 2225.

2250. American Religious History I (To 1865). 3. [CH,D◀H] Traces the history of religion in America through the Civil War. We will pay particular attention to the intertwining of religion and colonialism; the tension between emerging Protestant hegemony and religious pluralism; and the roles religion has played in justifying oppression and pursuing liberty in American history. Cross listed with HIST 2250.

2252. American Religious History II (1865-1945). 3. [CH,D◀H] Traces American religious history from the Civil War through WWII. Focuses on how race/ethnicity, class, gender, and national origin affected religion, and explores how Americans used religion in oppressing and liberating people; marking and erasing difference; and exporting values abroad as well as reforming society at home. Cross listed with HIST 2252.

2315. History of Non-Western Religions. 3. [CH,G◀H] Introduces students to religions outside the Judeo-Christian realm familiar in the west. Each religion analyzed in its world views, its ways of life, and in its social organization. History of each religion and its changes. Cross listed with HIST 2315.

2320. History of Islam. 3. [CH,G◀COM2] Focuses on the origins of Islam and its early formation, its growth and spread across the world, and its intellectual, spiritual and historical character. Time will also be spent on the formation of Islam in the modern world and how that impacts the views and actions of its members. Cross listed with HIST 2320.

2330. Islam in the Modern World. 3. [(none)◀H] How does Islam interact with Modernity? This course extends beyond the news to study contemporary trends and move-

ments among the world's Muslims. Includes a general introduction to the history and religion of Islam, and discusses contemporary Islamic topics, reflecting current issues, instructor research and student choices.

2410. Varieties of Non-Belief in the Western World. 3. [CH◀H] A broad, chronological survey of different types of non-belief, primarily from the Renaissance onwards. It examines critiques by philosophers, politicians, poets, and novelists aiming to understand their objections to religion and analyzing how these objections shaped the modern religious landscape and the way we understand religion itself.

2450. Traditional African Religion. 3. [CH,G◀COM2] Surveys traditional African religions, both ancient and contemporary. Cross listed with AAST 2450.

2500. Special Topics in Religion. 1-3 (Max. 6). Permits occasional investigation of different subjects in academic study of religion.

3090. Middle East and Israel in Film. 3. [(none)◀H] Focus on film representations of Israel, the Arab world, Turkey and Iran. Studies religion and society, common human aspirations, modalities of social and other conflicts through screening of feature and short films and discusses issues raised by historical, political, social, cultural and religious tensions and considerations in this region. *Prerequisite:* WA or COM1.

3110. Bible and Archaeology. 3. An archaeological survey illuminating the historical, theological, and cultural landscape of ancient Near East and the Mediterranean world. Examines how archaeology contributes to the understanding of the peoples, texts and religious movements of the Old Testament/Hebrew Bible and the New Testament. *Prerequisites:* RELI 1000 or RELI 2110 or RELI 2150 or ANTH 1300 or ANTH 1450.

3200. Religion and American Culture. 3. [(none)◀H] Explores the role of religion in the history of American culture. It considers how developments in American religious history have reflected larger trends in American society, and how those developments have in turn helped shape American society and culture. *Prerequisite:* one lower-level course in religious studies, American history, or American studies.

3220. History of the Modern Middle East. 3. [G◀(none)] Surveys the Middle East from 1700 to the present. Emphasizes the demise of the Ottoman Empire, the rise of domination by European colonial powers, transformations in political, social, religious and cultural life, the rise of nationalist movements, the influence of oil, the growth of Islamist political groups

and the Israeli-Palestinian conflict. Cross listed with HIST 3220. *Prerequisite:* 6 hours or HIST, RELI, or INST.

3225. Apocalypse: The History of the End. 3. The apocalyptic End of Time has become the subject of much speculation, especially since the beginning of the new millennium. Analyzes such speculation as a religious phenomenon in both ancient and modern religions, and attempts to understand its social, cultural and personal impacts. *Prerequisite:* junior standing.

3230. Early Christianity. 3. Considers the development of the Christian religion from a small Jewish sect to its place as the official religion of the Roman Empire and beyond. It examines the development of creeds, doctrines and institutions, placing them within their historical context. *Prerequisite:* RELI 1000, RELI/HIST 2225, or HIST 2113.

3235. Medieval Christianity. 3. Traces the development of 'Christendom' in Europe between about 500 - 1500 CE, concentrating on the Latin West. It examines the growth of Christian institutions and practices, the Church's role as sole governing entity, along with conflicts with secular governments as they developed in later centuries. Cross listed with HIST 3235. *Prerequisites:* RELI/HIST 2225, HIST 1110, or RELI 1000.

3240. Reformation and Enlightenment Christianity. 3. The years between about 1500 and 1800 saw the permanent dismantling of Christianity in the West as a unified force, as Protestantism brought new ways of viewing the relationship between God and humanity. Once the fragmentation began, it accelerated rapidly as Enlightenment thinking challenged Christianity in new and complex ways. Cross listed with: HIST 3240. *Prerequisites:* RELI 1000, RELI/HIST 2225.

3245. Christianity Since Darwin. 3. [(none)◀COM2] Christianity has faced many challenges since the mid-nineteenth century, including the thought of Darwin, Marx and Freud, to name a few. Christianity has faced those challenges in various ways and its practitioners continue to re-examine its understandings of a vastly changed and continually changing world. *Prerequisites:* COM1, and RELI 1000 or RELI/HIST 2225 or HIST 1120 or consent of instructor.

3260. African Spirits in the New World. 3. [CH,G◀H] Begins with Yoruba roots in Africa and travels with the African Diaspora focusing on spirit possession in Haitian Vodou, Cuban Santeria, Jamaican Revival Zion, Jamaican Rastafarianism, Brazilian Candomblé, and "Black Church" in the United States using ethnography and postcolonial theory

of religious studies. Cross listed with AAST 3260. *Prerequisites:* AAST 1000 or any AAST 2000 level course or RELI 1000.

3275. World Christianities. 3. [CH,G◀▶(none)] Examines the development of Christianity primarily in Africa, Asia and South America. Cross listed with HIST 3275. *Prerequisites:* WB and CH.

3320. Eastern Thought. 3. Surveys some of the major concepts in Zen, Hinduism, Buddhism, Taoism and Confucianism. Cross listed with PHIL 3320. *Prerequisite:* 3 hours of philosophy.

3340. Mysticism, Yoga, and Enlightenment in the East. 3. Explores Hindu and Buddhist concepts of enlightenment and the means for reaching them through mysticism and yoga. Study the texts and beliefs and their translation into practice. *Prerequisites:* WB and CH.

3350. Religion and Globalization in India. 3. Learn about religious pluralism in India. In particular, how globalization has impacted the ways people from many different religions, caste, class, and educational backgrounds, ethnicities, and regions experience and practice their religions in 21st century India. *Prerequisites:* RELI 1000 or RELI 2050.

3400. Religion in the American West. 3. [CH,D◀▶(none)] Considers the religious history of the American West from Pre-Columbian times to the present, paying special attention to the ways the West affects religious belief and practice. Themes of contact and conflict will be particularly important in our study, as will the changing perceptions of the West. *Prerequisite:* USP WB course.

4000. Theories of Religion. 3. [WC◀▶COM3] Investigates different theories proposed to explain religion and methods used to investigate them. Pays primary attention to influential thinkers and theorists of the past century. *Prerequisite:* RELI 1000, and 12 additional hours in Religious Studies, at least 6 of which must be at the 3000-level or above, junior standing.

4090. Film and Religion. 3. Movies use religion to convey messages; they debate religious issues and use religion to debate non-religious issues. This course analyzes how film makers use religion and religious themes to transform religions into advocates for social issues and to shape religion's role in society. Popular films drawn from many genres. Cross listed with ENGL 4090. *Prerequisite:* 6 hours of 2000-level or higher literature courses or religion courses.

4100. African American Religious Culture. 3. [WC,D◀▶COM3] This mid-level writing-intensive seminar is a comparative study of African American religious celebration, primarily in the context of Afro-Christianity, but touching on Islam, Candomblé, "Voodoo,"

Santeria, and Rastafarianism. Cross listed with AAST 4100. *Prerequisite:* WB and one of the following: AAST 1000 or any AAST 2000-level course or RELI 1000.

4113. Medieval Religious Dissent. 3. Religious dissent in the Middle Ages included what might be called heresy, but also encompasses such marginal groups as Jews and witches. Examines development of orthodoxy and persecution of religious diversity between eleventh and 16th centuries within the historical context of the times. Cross listed with HIST 4113. *Prerequisite:* 9 hours of HIST or RELI.

4160. Moses, Jesus, and Muhammad. 3. [CH◀▶(none)] Examines the biographies of Moses, Jesus and Muhammad found in works of history, in sacred literature, in hagiography, ritual and popular culture. Demonstrates strategies used to recover their historical personalities and how they are portrayed in multiple religious traditions, offering insights into how each have shaped our world. *Prerequisite:* RELI 1000 or junior standing.

4174. Judaism from Ezra to Jesus. 3. This course focuses on the religious and historical development of Judaism during the centuries between the end of the Old Testament and the New Testament, studying the arrival of Greek and then Roman culture and the changes Judaism underwent during that time that endure today. Cross listed with HIST 4174. *Prerequisites:* WB or COM2, and RELI 1000 or RELI 2110.

4175. Judaism at the Dawn of Christianity. 3. Judaism is the only Mediterranean religion that was practiced in the ancient world as well as in Late Antiquity and beyond. This course helps students analyze how Judaism was able to change and adapt at key moments to provide its adherents with an active, living religion that addressed their needs. Cross listed with HIST 4175. *Prerequisites:* RELI 1000 or RELI 2110, and junior standing.

4190. Women and the Bible. 3. Explores depictions, roles and statuses of women found in the Bible, both Old and New Testaments. Introduces ways biblical portraits of women have been used in recent centuries to develop theologies of, by and for women. *Prerequisite:* junior standing or permission of instructor.

4260. Judaism in the Modern World. 3. Studies Jews and Judaism from pre-modern period to present. Traces migration of Jews from Europe to the USA and Israel, while examining radical changes that transform the religion. *Prerequisite:* junior standing.

4310. Seminar in Asian Religions. 3 (Max. 9). Students will be introduced to a number of indigenous and analytical frameworks and interdisciplinary theories and methods in the examination of a specialized topic in the study

of Asian religions. Specific focus of the course varies by semester. *Prerequisite:* RELI 2050 or junior standing.

4335. Women and Islam. 3. Examines women's lives in Islamic societies from the seventh century to the present in the Middle East and throughout the world. Themes include women's position in Islamic law, society and culture, Western images of Muslim women, veiling and Islamist movements, theoretical readings on power, gender and agency. Cross listed with HIST 4335 and WMST 4335. *Prerequisite:* 9 hours of HIST, WMST, INST, or RELI.

4500. Special Topics in Religious Studies. 1-3 (Max. 12). Presents from semester to semester a variety of important topics in the academic study of religion. *Prerequisite:* RELI 1000.

4635. Religious Studies Departmental Honors. 0. Satisfactory completion of this course indicates that Religious Studies Departmental Honors have been conferred on the student. Offered Satisfactory/Unsatisfactory only. *Prerequisites:* Consent of Religious Studies thesis chairperson; demonstration of competency in a foreign language equivalent to a fourth-semester college level or concurrent enrollment in a fourth-semester foreign language course.

4900. Independent Study in Religion. 1-3 (Max. 6). Primarily for juniors and seniors who can benefit from independent study of topics in religious studies not covered in course offerings. Guidance provided by faculty member in the appropriate field. *Prerequisites:* 9 hours in religious studies and consent of instructor.

4930. Thesis. 0-6 (max. 9). Directed research and writing supervision of Religious Studies thesis chairperson. Results in production of Religious Studies thesis. *Prerequisites:* Successful completion of or concurrent enrollment in RELI 4000, advanced undergraduate status in good academic standing, consent of Religious Studies thesis chairperson and department chair.

4960. International Field Course. 1-6 (Max. 12). This course takes students away from campus to locations outside the United States to study religion on site in its geographic and cultural context. Destination and specific content varies, but the course always requires attention to the connections between world events and local experiences. *Prerequisites:* Junior standing; WA or COM1; other prerequisites as determined by the instructor.

4961. Domestic Field Course. 1-6 (Max. 12). This course takes students away from campus to other locations in the United States to study religion on site in its geographic and cultural context. Destination and specific content var-

ies, but the course always requires attention to the religious, racial, ethnic, and cultural diversity of religion in the United States. *Prerequisites:* Junior standing, WA or COM1.

Physics and Astronomy

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Department Head: Jinke Tang

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Assistant Lecturer:

AYSEUR BICER, B.S. Ege University 2006; M.S. 2009; Ph.D. Texas A&M University 2018; Assistant Lecturer in Physics 2019.

Adjunct Professors:

Marquard, Shang, Slater

Professors Emeriti:

Ronald W. Canterna, Paul E. Johnson, A. Raymond Kunselman, Terry P. Roark, James M. Rosen, Jimmie Verley

Physics originated in antiquity as the study of natural philosophy. As such, it attempts to describe the universe within the context of both physical laws and the fundamental particles of nature. The broad scope of physics runs from the microscopic nuclear structure and that of the elementary particles themselves to the macroscopic, the galaxy and evolution of the universe as a whole. Today the subject is generally divided into broad areas such as condensed matter, nuclear, elementary particles, astrophysics, etc. The department maintains competence in most major branches of physics and offers instruction in these areas at both the undergraduate and graduate levels. In addition, it has a strong interest and involvement in science education.

Learning Outcomes

The B.S. and B.A. in Physics, the B.S. in Astronomy, and the B.A. in Physics and Physics Education all have the broad objectives enumerated below. These objectives are designed to promote the success of our majors in their chosen career path, whether that takes them into academia, secondary teaching, industry or further education:

1. Provide students with problem-solving and data-manipulation skills appropriate to the growing range of scientific and technological careers in academia or industry.
2. Develop students' oral, written, interpersonal and communication skills.
3. Provide students with skills in experimental design, data collection, and data analysis through research experiences in a laboratory/computational/telescope setting.
4. Educate students in the application of mathematical tools that will be useful for them to achieve success in a post-college career.
5. Provide a conceptual and analytical understanding of the core areas of physics and their specialty area.
6. Provide students with an understanding of scientific reasoning, i.e., the roles of theory, hypothesis, and experiment in the scientific method.

The B.S. in Physics and the B.S. in Astronomy are primarily designed for students who wish to pursue post-graduate education or to have a more in-depth physics background. The Physics B.A. is primarily designed for students interested in pursuing a double major, or a professional career. The B.A. in Physics and Physics Education is structured for those interested in pursuing a secondary science teaching career.

Undergraduate Curriculum

The four-year physics programs are the Bachelor of Arts in physics and the Bachelor of Science in physics. The Bachelor of Science programs are intended for students who will pursue a career or a graduate degree in the field, whereas the Bachelor of Arts program is primarily geared toward those who are interested in pursuing physics as a second major. The department also offers a Bachelor of Science degree in Astronomy and Astrophysics.

Bachelor of Science Major Program

Students in the Bachelor of Science in Physics major program are required to complete the following courses:

- PHYS 1210 or 1310, 1220 or 1320, 2310, 2320, 3000, 3640, 3650, 4210, 4310, 4410, 4420, 4510, 4830, and 4840.
- Students are required to take at least 3 hours of electives from any PHYS 4000- or 5000-level course.
- MATH 2200, 2205, 2210, 2250, and 2310.

Bachelor of Arts Major Program

Students in the Bachelor of Arts in physics major program are required to complete the following courses:

- PHYS 1210 or 1310, 1220 or 1320, 2310, 2320, 3000, 3650, 4210, 4310, 4410, 4510.
- Students are required to take at least 3 hours of electives from any PHYS 4000- or 5000-level course.
- MATH 2200, 2205, 2210, 2310.

Minor Program

- Complete PHYS 1210 or 1310
- Complete PHYS 1220 or 1320
- PHYS 2310 and 2320
- At least two of the following: PHYS 4210, 4310, 4410, 4510

Astronomy Major Program

Students in the Bachelor of Science in Astronomy major program are required to complete the following courses:

- ASTR 1050, 2310, 2320, 4610
PHYS 1210 or 1310, 1220 or 1320, 2310, 2320, 3000, 3640, 3650, 4210, 4310, 4410, 4420, 4510, and 4840
- MATH 2200, 2205, 2210, 2250, and 2310

Astronomy Minor Program

- Complete PHYS 1210 or 1310
- Complete PHYS 1220 or 1320
- PHYS 2310 and 2320
- ASTR 2310 and 2320

Graduate Study

The Department of Physics and Astronomy offers the degrees of master of science in physics, master of science in teaching, and doctor of philosophy. Advanced degrees in physics may be based on experimental or theoretical research in physics or astrophysics.

Please refer to the departmental homepage at <http://www.uwyo.edu/physics/> for the programmatic updates, or contact the department directly.

Program Specific Admission Requirements

Applicants for graduate study in physics or astrophysics should have an undergraduate preparation in physics and mathematics equivalent to that specified for a physics major. Applicants for graduate study in physics or astrophysics should have an undergraduate preparation in physics and mathematics equivalent to that specified for a physics major. They must submit their GRE scores for the verbal aptitude, the quantitative aptitude, and analytical writing.

Program Specific Graduate Assistantships

The Physics and Astronomy Department commits to providing first- and second-year students with teaching assistantships for the nine-month academic year. More advanced students are generally supported on federal grants or fellowships. Both teaching and research assistantships carry a full tuition waiver and insurance. Summer assistantships are often available to students making satisfactory progress. Refer to <http://www.uwyo.edu/physics/> for current amounts.

Program Specific Degree Requirements

Master of Science in Physics Plan A (thesis)

26 hours of graduate coursework, 20 of which must be in PHYS/ASTR at the 5000-level
4 hours of PHYS 5960

Plan B (non-thesis)

30 hours of graduate coursework, 24 of which must be in PHYS/ASTR at the 5000-level

Thesis planning, development, and production guided by the committee chair and graduate committee.

Master of Science in Teaching Plan A (thesis)

18 hours from PHYS/ASTR at the 5000-level
12 hours from PSYC or the College of Education at the 4000- or 5000-level

Thesis planning, development, and production guided by the committee chair and graduate committee.

The Master of Science in Physics with emphasis in teaching is designed for graduate students preparing to teach in secondary schools or in community colleges. It will include a small, carefully designed component in psychology and education, and includes a supervised teaching experience. This program will require a thesis project based on experience in the classroom.

Doctoral Program

42 hours of graduate coursework

30 hours of PHYS 5980 or 5860. Dissertation planning, development, and production guided by the committee chair and graduate committee.

During the first two years, students normally take physics and astronomy courses while working with faculty members on one or more research projects. Course work consists of several required courses plus a number of elective courses. Students participate in weekly research seminars and journal clubs to learn about a broad range of current research. By the third year, Ph.D. students begin research work in the area of their dissertation.

Required courses for the Physics track:

PHYS 5310 Quantum Theory I
PHYS 5410 Electromagnetic Theory I
PHYS 5510 Statistical Mechanics I
PHYS 5720 Advanced Solid State
PHYS 5750 Optical Properties of Solids
PHYS 5730 Condensed Matter Magnetism
PHYS 5740 Transport Properties of Solids

Required courses for the Astronomy track:

ASTR 5150 Astronomical Techniques
ASTR 5420 Stellar Structure and Evolution
ASTR 5460 Cosmology
ASTR 5470 Interstellar Medium and Diffuse Matter
ASTR 5465 Galaxies

Plus two of the following:

PHYS 5310 Quantum Theory I
PHYS 5410 Electromagnetic Theory I
PHYS 5510 Statistical Mechanics I

Ph.D. candidates demonstrate their competency in basic undergraduate physics and in required graduate courses through a written examination. After passing the written exam, students will take an oral preliminary exam based on a research project they have completed during the first two years. At the completion of the Ph.D. dissertation, a candidate makes a public presentation of his or her work and the committee conducts a final examination to award the degree.

Astronomy (ASTR)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦PN]).

1000. Descriptive Astronomy. 3. [(none)♦PN] Covers essential features of the solar system, stellar astronomy and time measurement. Students who have taken ASTR 2310 may not earn credit in ASTR 1000, and not more than 4 credit hours may be earned by taking both ASTR 1000 and 1050.

1050. Survey of Astronomy. 4. [SE♦PN] Consists of 3 lecture periods and a two-hour laboratory in observational and laboratory astronomy. Observing sessions are scheduled after dark and held when weather permits. Designed primarily for non-science majors. *Prerequisite:* MATH 1000 or equivalent, or passing the Mathematics Placement examination at Level 2.

1070. The Earth: Its Physical Environment. 4. [SE♦PN] Discusses selected topics from geology, astronomy and meteorology illustrating fundamental concepts, processes, products and the interrelationships among them. Emphasizes nature of science and relationship between selected topics and society. Cross listed with GEOL 1070. *Prerequisites:* Math Level 3 or equivalent courses; consent of instructor; enrollment reserved for elementary education majors; EDCI 2000 must be selected concurrently.

2310. General Astronomy I. 4. Covers the history of astronomy, orbital mechanics, solar system (the Sun, planetary interiors, atmospheres, moons, comets, meteors); interaction of radiation and matter (physical processes in gas, black body radiation) astronomical instrumentation and detectors. Laboratory includes exercises in observational astronomy. Observing sessions are scheduled after dark and held when weather permits. PN designation. *Prerequisites:* PHYS 1210 or 1310, MATH 2200. (Normally offered spring semester)

2320. General Astronomy II. 4. Covers the properties of stars, stellar atmospheres and stellar evolution, interstellar matter, galaxies and cosmology including models of the universe, the Big Bang, and dark energy. Laboratory includes exercises in observational astronomy. Observing sessions are scheduled after dark and held when weather permits. PN designation. *Prerequisites:* PHYS 1210 or 1310, MATH 2200.

4000. Astronomy for Teachers. 1-5 (Max. 5). Specifically designed for elementary school teachers. Presents basic concepts (time, seasons, light and its properties); planetary sys-

tems of the sun; the sun and stars; the Milky Way and galaxies; and cosmology and relativity. Emphasizes presenting these concepts to elementary school children. Half the class is devoted to laboratory and workshop activities to develop techniques for presenting these concepts through visual aides, demonstrations and films. Students may receive a maximum of 5 credits in a combination of ASTR 4000 and 4100. *Prerequisites:* 6 hours of physical or biological science, junior standing in education. (Offered summer session)

4100. Astrophysics for Secondary Teachers. 1-3 (Max. 3). Discusses modern physics, emphasizing obtaining and analyzing real data. Adaptable to junior and senior high school science classrooms. Special projects include analysis of planetary positions and images; direct observations of the sun; predictions of eclipses and tides; analyses of basic astronomical data of stars, star clusters, galaxies and clusters of galaxies; and cosmological modeling. Students may receive a maximum of 5 credits in a combination of ASTR 4000 and 4100. *Prerequisite:* junior standing in secondary science education. (Offered summer session)

4610. Introduction to Astrophysics. 3. Includes astrophysical sources of radiation, radiation transport, nonequilibrium processes, stellar atmospheres, stellar interiors and the interstellar medium. *Prerequisites:* ASTR 2310, PHYS 2310 and concurrent registration in PHYS 4210 and 4410.

4620. Modern Research in Astrophysics. 3. Taught jointly by astrophysics faculty and others. Includes several topics of current research in astrophysics. *Prerequisite:* ASTR 4610.

4860. Problems in _____. 1-4 (Max. 12). Independent, in-depth study of selected problems in astronomy and astrophysics. Entirely laboratory-oriented investigations of astronomical objects. *Prerequisites:* ASTR 2310 and PHYS 2310.

5150. Astronomical Techniques. 4. Discusses selected topics in observational astronomy such as applications of the Fourier transform, design of optical instruments, properties of various detectors of electromagnetic radiation, sources of uncertainty in astronomical data, reduction techniques for these data, and techniques of image processing. *Prerequisite:* graduate standing in astrophysics.

5160. Data Mining in Large Astronomical Surveys. 4. Aimed at an understanding of how to manipulate and analyze catalog-level data from large astronomical surveys. Students will address realistic problems in data mining large astronomical surveys using one or more programming languages. *Prerequisites:* graduate standing.

5420. Stellar Evolution and Structure. 4. The life cycle of stars forms the basis for this course, including formation and early evolution, hydrostatic structure, and late stages of evolution. In addition, energy generation and transport are presented. *Prerequisite:* graduate standing in astrophysics.

5460. Galactic Structure and Evolution: Cosmology. 4. Presents material describing current cosmological models and their application to areas of extragalactic astronomy. Topics include cosmic dynamics, introduction to relativistic models, measuring parameters, dark matter, dark energy, the cosmic microwave background radiation, big bang nucleosynthesis. *Prerequisite:* Graduate standing in astrophysics.

5465. Galaxies. 4. Presents material necessary for study of the Milky Way, galaxies, active galaxies, and the large-scale structure of the universe. Topics include stellar populations, kinematics and dynamics in the Milky Way and other galaxies, galaxy classification and properties, and active nuclei and quasars. *Prerequisite:* graduate standing in astrophysics.

5470. Interstellar Medium and Diffuse Matter. 4. The material between stars is the primary topic, including the chemistry, energetics, and evolution of interstellar matter. The formation of molecules and dust grains, and their composition, are also discussed. Emission processes characteristic of the ISM are described. *Prerequisite:* ASTR 5460.

5490. Planets and Their Stars. 4. Reviews recent and current research in planets and exoplanets. Topics may include planet formation, known properties of exoplanets, comparisons to Solar System planets, properties of planet-hosting stars, and evolution of planetary systems. *Prerequisites:* graduate standing or permission of the instructor.

5630. General Relativity and Cosmology I. 3. Presents a detailed study of Einstein's theory of the gravitational field with emphasis on the geometric structure of space-time, and selected topics in general relativity. *Prerequisite:* PHYS 5320, 5420.

5860. Independent Study. 1-4 (Max. 24). Investigations on the level of original graduate research in astrophysics. *Prerequisite:* ASTR 4860 or equivalent.

5870. Special Topics in Astronomy. 1-4 (Max. 20). *Prerequisite:* graduate standing

5960. Thesis Research. 1-9 (Max. 48). Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrollment in a graduate degree program.

5980. Dissertation Research. 1-9 (Max. 48). Graduate level course designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate degree program.

Physics (PHYS)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◆PN]).

1050. Concepts of Physics. 4. [SP◆PN] Introduces the physical world. For students whose background in math and science is minimal; recommended for students in paramedical sciences and medical technology. Three lecture hours per week are supplemented by two hours per week of laboratory work. *Prerequisite:* MATH 1000 or equivalent, or passing the Mathematics Placement examination at Level 2.

1090. The Fundamentals of the Physical Universe. 4. [SP◆PN] Applies fundamental principles of chemistry and physics to real life situations. Primarily for elementary education majors. *Prerequisites:* MATH 1000 or equivalent, or passing the Mathematics Placement examination at Level 2.

1101. First-Year Seminar. 3. [(none)◆FYS]

1110. General Physics I. 4. [SP◆PN] First course of two-semester sequence. Introduces elementary college physics without calculus. Primarily for premedical, pre dental, preoptometry, prephysical therapy and other students requiring insight into workings of the physical world. Includes classical mechanics, gravitation and heat. Laboratory sessions will illustrate principles studied. Students receiving credit for PHYS 1110 cannot receive credit for PHYS 1050, 1210 or 1310. *Prerequisite:* MATH 1450, 1405 or equivalent. (Normally offered fall and summer semester)

1120. General Physics II. 4. [SP◆PN] Follows PHYS 1110 and completes introduction to physics without calculus. Includes electricity, magnetism, optics and modern physics. Laboratory sessions illustrate principles studied. Students receiving credit in PHYS 1120 cannot receive credit in PHYS 1050, 1220 or 1320. *Prerequisite:* PHYS 1110. (Normally offered spring and summer semester)

1210. Engineering Physics I. 4. [SP◆PN] First course of a two-semester sequence. Provides introduction to physics with calculus for engineering students. Includes classical mechanics, gravitation and mechanical waves. Laboratory sessions illustrate principles studied. Students receiving credit for PHYS 1210

cannot receive credit for PHYS 1050, 1110, or 1310. *Prerequisites:* a grade of C or higher in MATH 2200 and concurrent enrollment in MATH 2205.

1220. Engineering Physics II. 4. [SP◆PN] Follows PHYS 1210 and continues introduction to physics with calculus for engineering students. Includes electricity, magnetism and heat. Laboratories illustrate principles studied. Students receiving credit for PHYS 1220 cannot receive credit for PHYS 1050, 1120, or 1320. *Prerequisites:* grades of C or higher in MATH 2200, 2205 and concurrent enrollment in MATH 2210.

1310. College Physics I. 4. [SP◆(none)] First course of two semester sequence. Provides thorough introduction to physics with calculus. Primarily for majors in physics, astronomy, and other areas in science, mathematics and technology requiring the highest levels of sophistication. Includes classical mechanics, gravitation and mechanical waves. Laboratory sessions illustrate principles studied and meaning of physical measurement. Students receiving credit for PHYS 1310 cannot receive credit for PHYS 1050, 1110, or 1210. *Prerequisites:* MATH 2200 and concurrent enrollment in MATH 2205.

1320. College Physics II. 4. [SP◆(none)] Follows PHYS 1310 and continues introduction to physics with calculus. Includes electricity, magnetism and thermodynamics. Laboratory sessions illustrate principles studied and meaning of physical measurement. Students receiving credit for PHYS 1320 cannot receive credit for PHYS 1050, 1120 or 1220. *Prerequisites:* MATH 2200, 2205 and concurrent enrollment in MATH 2210.

2250. Thermodynamic Systems in Energy Science. 4. Introduces the principles of thermodynamics and their application to energy science. Intended for students majoring in Energy Resource Science. *Prerequisites:* PHYS 1210, grade of C or higher in MATH 2205.

2310. Physics III: Waves and Optics. 4. Third-semester course primarily for majors in physics, astronomy, engineering, mathematics, and other sciences. Includes Gaussian Optics and matrix calculations, wave equations, interference, superposition principle, elementary Fourier Analysis, Fraunhofer and Fresnel Diffraction, application to optical instruments. *Prerequisite:* PHYS 1220 or 1320 or equivalent.

2320. Physics IV: Modern Physics. 3. Fourth semester course primarily for majors in physics, astronomy, engineering, mathematics, and other physical sciences. Topics include introductory quantum mechanics, nuclear and particle physics, lasers, Planck's Blackbody Radiation, photoelectric effect,

electron diffraction, wave-particle duality, de-Broglie Wavelength, Bohr Atom, Heisenberg Uncertainty Principle, Schrodinger Equation, and Einstein's Special Theory of Relativity. *Prerequisite:* PHYS 1220 or 1320 or equivalent.

2870. Special Topics in _____. 1-4 (Max. 4). Presents various subjects not available in regularly scheduled courses. *Prerequisite:* consent of instructor. (Offered based on sufficient demand and resources)

3000. Methods of Physics. 4. Provides introduction to mathematical methods and modern scientific computational tools used in physics/astronomy. Topics include introduction to Python or linux operating system and use LabView software to run laboratory apparatus. Course examples will draw upon material in Physics 1210/1220 to help build fluency in the first year physics material. *Prerequisite:* PHYS 1220.

3640. Modern Electronics and Experimental Techniques. 4. Introduced to analog and digital circuits/devices and computer interfacing with laboratory equipment and experiments. Includes computer programming, the analysis of experimental data, and report writing. Apply the skills developed in this class to interface with and control representative instrumentation used in experimental physics laboratories. *Prerequisites:* PHYS 2320.

3650. Advanced Lab in Modern Physics and Electronics. 4. [(none)◆COM3] Presents fundamentals of modern optics, modern and quantum physics, E&M/electronics, and thermodynamics in a project oriented interactive undergraduate laboratory with a focus on professional grade lab report writing that qualifies as WB USP. Students learn professional data handling, error theory, and data analysis. *Prerequisites:* WA and PHYS 2310 or 2320.

4000. Applied Laser Science. 3. Covers basic operational principles of lasers and their many applications in science and industry. *Prerequisites:* PHYS 2310 or equivalent; PHYS 4310. (Offered based on sufficient demand and resources)

4210. Classical Mechanics I. 3. First semester of a two-course sequence. Presents classical mechanics at intermediate level. Begins with elementary Newtonian mechanics and builds step by step into analytic mechanics. Includes simple harmonic motion of particles in one, two or three dimensions, gravitation; introduction to rigid-body motion; and introduction to Lagrangian and Hamiltonian Mechanics. *Prerequisites:* PHYS 2310 or equivalent, MATH 2210 or equivalent. (Normally offered spring semester)

4220. Classical Mechanics II. 4. Follows PHYS 4210. Presents classical mechanics at an intermediate to advanced level. Includes

detailed treatment of Lagrangian and Hamiltonian Mechanics, rigid-body motion, small oscillations and introduction to relativity. Dual listed with PHYS 5220. *Prerequisite:* PHYS 4210.

4310. Quantum Mechanics. 3. Studies fundamental concepts of quantum theory. *Prerequisite:* PHYS 4210. (Normally offered fall semester)

4340. Semiconductor Materials and Devices. 3. Physical properties of semiconductor materials and devices, including crystal lattices and energy bands, carrier generation, transport, and recombination. PN, metal-semiconductor, and heterojunction operation. Field Effect Transistors, including Metal Oxide Semiconductor (MOSFET), Junction (JFET), Metal Semiconductor (MESFET), and High Electron Mobility (HEMT) transistors. Bipolar Junction (BJT) and Heterojunction (HBT) Transistor operation. Cross listed with EE 4340. *Prerequisite:* PHYS 1220 or 1320.

4350. Advanced Quantum Mechanics. 3. Covers advanced topics in quantum mechanics, including angular momentum, quantum states in three dimension, hydrogen atomic structure, electron spin, Pauli matrices, time-dependent and independent perturbation methods, Born approximation, formal scattering theory, etc.. *Prerequisites:* PHYS 4210, 4310, 4420 and MATH 4440. (Normally offered spring semester)

4410. Electricity and Magnetism I. 3. First semester of a two-course sequence. Presents electricity and magnetism on intermediate level, emphasizing fields. Begins with review of vector algebra and calculus and proceeds to discussion of electrostatics, potential theory and steady currents. *Prerequisites:* PHYS 2310 or equivalent and MATH 2210. (Normally offered fall semester)

4420. Electricity and Magnetism II. 3. Follows PHYS 4410 and continues intermediate discussion of electricity and magnetism. Covers magnetostatics, magnetoquasistatics, alternating currents, electromagnetic waves, transmission lines and antennae. *Prerequisite:* PHYS 4410. (Normally offered spring semester)

4510. Thermodynamics and Statistical Mechanics. 3. Presents fundamental principles of thermodynamics, emphasizing mathematical development. *Prerequisites:* PHYS 4310 or equivalent and MATH 2210.

4710. Solid-State Physics. 3. Surveys theory and application of solid state physics using quantum theory. Emphasizes relation between theory and experiment. Discusses areas of present research activity. *Prerequisites:* PHYS 4310 and 4510.

4720. Solid State Electronic Devices. 3. This course aims to develop basic semiconductor physics concepts, so students can better understand current and future solid state electronic devices and technology. *Prerequisites:* PHYS 4210, PHYS 4310, PHYS 4420 and MATH 4440.

4830. Mathematical and Computational Physics I. 3. First semester of a two-semester sequence. Provides a comprehensive overview of mathematical physics and numerous analytical mathematical techniques applied to physics problems. Topics include: numerical computations and visualizations, differential and integral vector analysis, linear algebra, infinite series, complex variables, partial differential equations, ordinary differential equations, integral transforms and equations, and calculus of variations. *Prerequisites:* PHYS 2310 or PHYS 2320 and MATH 2210, MATH 2250, MATH 2310.

4840. Mathematical and Computational Physics II. 4. Second semester of a two-semester course. Provides a comprehensive overview of computational physics and provides numerous numerical techniques applied to physics problems. Topics include: numerical computations and visualizations, numerical solutions of ordinary differential equations, linear systems, curve fitting, discrete Fourier transforms, partial differential equations, integration, and Monte Carlo simulations of general stochastic systems. A weekly lab session will be held. *Prerequisite:* MATH 2210, PHYS 2320 and PHYS 3000.

4860. Independent Study in _____. 1-6 (Max. 12). Encompasses independent study to advanced problems which may involve either library and/or laboratory research. *Prerequisite:* PHYS 2310. (Offered based on sufficient demand and resources)

4870. Special Topics in _____. 1-6 (Max. 12). Presents various subjects not available in regularly scheduled courses. *Prerequisites:* PHYS 2310 and consent of instructor. (Offered based on sufficient demand and resources)

4970. Senior Research/Internship. 1-3 (Max. 4). Requires a practical research experience or internship from the student up to 4 credits under the advisement of a faculty member. This requirement for graduation should lead to a professional publication or document written by the student. The credit requirements may be spread over several semesters.

5110. Methods of Theoretical Physics I. 4. First semester of a two-semester sequence which introduces mathematical techniques used in graduate physics courses. The content may be adjusted to meet the needs of the

students. This course is required for M.S. and Ph.D. students. *Prerequisite:* PHYS 4310, PHYS 4410, MATH 4440 or equivalent.

5120. Methods of Theoretical Physics II. 4. Designed to follow PHYS 5110 and will introduce further mathematical techniques used in graduate physics courses. Required for M.S. and Ph.D. students. *Prerequisite:* PHYS 5110.

5130. Ultrafast Science and Spectroscopy. 4. This graduate course introduces major themes, topics, and techniques in modern ultrafast science. *Prerequisites:* PHYS 4350 (or equivalent) and PHYS 4420 (or equivalent).

5210. Classical Mechanics. 4. Advanced classical dynamics beginning with classical Lagrangian and Hamiltonian formalism, covering relativistic Lagrangian formulation, canonical transformations, Hamilton-Jacobi theory, and small oscillations. A required course for Ph.D. students. *Prerequisite:* PHYS 4220, MATH 4440 or equivalent, and concurrent registration in PHYS 5110.

5220. Classical Mechanics II. 4. Presents classical mechanics at an intermediate to advanced level and is designed to follow PHYS 4210. Includes a detailed treatment of Lagrangian and Hamiltonian mechanics. Rigid-body motion, small oscillations, and an introduction to relativity. Dual listed with PHYS 4220. *Prerequisite:* PHYS 4210.

5230. Advanced Classical Mechanics. 4. The developments of the 1970s and 1980s, including a major expansion in our understanding of chaotic motion in many areas of science, will be brought together in a coherent framework. A strong computational component will be associated with many of the problems studied. *Prerequisite:* PHYS 4210 and 5220 or equivalent.

5310. Quantum Theory I. 4. First semester of a two-semester sequence which presents quantum mechanics on a professional level. Includes topics such as infinite dimensional vector spaces, postulates of quantum mechanics, exactly soluble bound systems, and angular momentum. Required for M.S. and Ph.D. students. *Prerequisite:* PHYS 4220, PHYS 4310, MATH 4440 or equivalent, concurrent registration in PHYS 5110.

5320. Quantum Theory II. 4. Designed to follow PHYS 5310 and will present topics such as scattering by a potential, addition of angular momentum, stationary and time dependent perturbation, identical particles. It is required for M.S. and Ph.D. students. *Prerequisite:* PHYS 5310 and concurrent registration in PHYS 5120.

5410. Electromagnetic Theory I. 4. The first semester of a two-semester sequence which presents electromagnetic theory on a

professional level. The classical analytic solutions of the equations of motion are discussed and expressed as quadratures over the Green functions with attention to effect of boundary conditions. It presents topics such as algebra and calculus of vectors in configuration space, electrostatics, potential theory, and steady currents. Required for M.S. and Ph.D. students. *Prerequisite:* PHYS 4420, PHYS 5110, MATH 4440 or equivalent.

5420. Electromagnetic Theory II. 4. Designed to follow PHYS 5410 and will present topics such as magnetostatics, magnetoquasistatics, time dependent electromagnetic theory, physical optics with a vector field, and radiation from antennae. Required for Ph.D. students. *Prerequisite:* PHYS 5410.

5510. Statistical Mechanics. 4. An introduction to statistical mechanics and the many-body problem, including quantum statistics. Required for Ph.D. students. *Prerequisite:* PHYS 5210, 5320, 5410.

5610. Atomic and Molecular Spectroscopy. 3. A quantum mechanical treatment of atomic and molecular structure, transition probabilities, selection rules, and the Zeeman and Stark effects. *Prerequisite:* PHYS 5320.

5620. Atomic Physics. 4. This course will cover atomic phenomena with a focus on atomic transitions and an introduction to particle physics. *Prerequisites:* PHYS 4310 or equivalent, PHYS 5410 or equivalent.

5720. Advanced Solid State Physics. 3. A course in modern topics and theoretical technique relevant to condensed matter. *Prerequisite:* PHYS 4710 or equivalent, PHYS 5510.

5730. Condensed Matter Magnetism. 4. Designed to give graduate students instruction in the fundamental principles of magnetism, the important properties of magnetic materials and their applications. Required for the physics track of the PhD program. *Prerequisites:* PHYS 4310, 4410, 4510 or equivalent.

5740. Transport Properties of Solids. 4. Instruction in the basic quantum theories of electron and phonon transport, interactions among the carriers and with impurities, and important transport phenomena in various systems. Required for the physics track students in the PhD program. *Prerequisites:* PHYS 4310, 4410, 4510 or equivalent.

5750. Optical Properties of Solids. 4. Covers advanced topics of optical properties of solids, including free carrier contribution to their optical properties, interband transitions, absorption of light in solids, luminescence and photoconductivity, electron spectroscopy and surface science, light emitting diodes, etc. *Prerequisites:* PHYS 4310, 4410, 4510 or equivalent.

5770. Nanotechnology: Nanophysics and Nanosystems. 4. Introduction to nanoscale fabrication techniques including lithography, pattern transfer, thin film deposition etc. Electronic transport in mesoscopic systems. Electrical properties of nanoscale devices including self-assembled monolayers, carbon nanotubes, and semiconductor nanowires. Noise properties of nanostructures. *Prerequisites:* PHYS 4310 or equivalent.

5810. Nuclear and Elementary Particle Physics. 3. An advanced course in nuclear and elementary particle interactions, with emphasis on current development. *Prerequisite:* PHYS 5350.

5820. Plasma Physics. 4. Introduction to plasma physics is exhibited through the analysis of numerous ionized environments (fusion systems, stellar surfaces, and the ionosphere). Fluid approximations (MHD), as well as a kinetic theory formulation (including the Vlasov equation) of plasma physics will be employed. Damping, instabilities, and nonlinear plasmas will be explored. *Prerequisites:* PHYS 4210 and PHYS 4420.

5830. Physics of Solar Cells. 4. Covers problems of energy economy, photon physics, physics of semiconductors, conversion of chemical energy into electrical energy, basic structure of solar cells, quantum-dot-semiconductor solar cells, limitations of energy conversions in solar cells, and strategies for higher efficiency. *Prerequisite:* PHYS 5720.

5840. Experimental Methods and Low Temperature. 4. Introduction to experimental methods in condensed matter physics and phenomena at low temperatures. The fields of solid properties at low temperatures, the generation and measurement of low temperatures, the generation of high magnetic fields in laboratory magnets, and basic vacuum technology are covered. *Prerequisite:* graduate standing.

5860. Independent Study. 1-4 (Max. 24). Designed to provide opportunities for self-study and special projects under supervision of individual professors. Restricted to graduate students. *Prerequisite:* PHYS 4860 or equivalent.

5870. Special Topics In Physics. 1-4 (Max. 20). Intended to accommodate various subjects not offered as regular courses. *Prerequisite:* graduate standing.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5980. Dissertation Research. 1-12 (Max. 48). Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate level degree program.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

School of Politics, Public Affairs, and International Studies

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Web site: www.uwyo.edu/sppais

School Head: Stephanie Anderson

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ZOE PEARSON, B.A. University of California Los Angeles 2005; M.A. Ohio State University 2010; Ph.D. 2016; Assistant Professor of Geography and International Studies 2016.

JUSTIN T. PICCORELLI, B.A. Loyola Marymount University 2004; M.P.A. Cleveland State University 2009; Ph.D. 2014; Assistant Professor of Public Administration 2015.

GABEL C. TAGGART, B.S. Brigham Young University 2010; M.P.P. 2013; Ph.D. Arizona State University 2017; Assistant Professor of Public Administration 2018.

Senior Academic Lecturer:

ANNE ALEXANDER, B.B.A. New Mexico State University, 1991; M.S. 1993; Ph.D. University of Wyoming, 2001; Senior Academic Lecturer, 2019, 2013; Interim Provost and Vice President for Academic Affairs 2020.

Associate Lecturer:

RUTH BJÖRKENWALL, B.A. University of California at Berkeley, 1989; M.A. 2004; Associate Lecturer 2018, 2013.

Professors Emeriti:

Winberg Chai, Larry Hubbell, Garth Massey, Margaret M. Murdock, Stephen C. Ropp, Oliver Walter

Associate Professor Emeritus:

Alan E. Schenker

Adjunct Faculty

(see department section following name for academic credentials)

Tanja Börzel, political science,

Freie Universitaet Berlin

Roger Coupal, agriculture and

applied economics

Susan Dewey, gender and women's studies

Michael Harkin, anthropology

Mark Peterson, management and marketing

Thomas Risse, political science,

Freie Universitaet Berlin

Amy Roberts, elementary and early

childhood education

Chris Rothfuss, international studies

Mona Schatz, social work

Ed Sherline, philosophy

J.J. Shinker, geography

Lilia Soto, American studies

and latina/o studies

Jim Thurman, international studies, political

science - Central Wyoming College

International Studies

Undergraduate Learning Outcomes

Goal 1. Students graduating with a BA in international studies will be able to recognize and appreciate the historical, political, social, cultural, and economic dimensions of international processes and issues, integrating these into an interdisciplinary perspective.

Goal 2. Students graduating with a BA in international studies will have the capability to critically read, write about, discuss, and engage in scholarly inquiry related to international processes and issues.

Goal 3. Students graduating with a BA in international studies will have a minimal level of fluency in a second language and are expected to experience a foreign locale in which to use the second language skills.

Goal 4. Students will be made aware of career and post-graduate opportunities suitable for an international studies major.

Graduate Learning Outcomes

All students who graduate with a Master's degree in international studies will be able to:

- Engage in independent empirical inquiry that makes an original contribution to the field of study;

- Think critically and reason logically about a problem and the ways it can be answered;
- Employ the best recognized methods appropriate to their research;
- Effectively develop alternative explanations, use theories and concepts to guide the research project, and conduct the work in such a way that disproof is possible; and
- Present their work intelligently, with both written and oral capability at a level of professional expectations.

They will have a broad understanding of:

- International affairs;
- The diversity of national cultures and social structures;
- Political and economic systems;
- Major global trends and problems.

International Studies Major

Students graduating with a degree in international studies will be able to recognize and appreciate the historical, political, social, cultural, and economic dimensions of international processes and issues, integrating these into an interdisciplinary perspective. uwo.edu/sppais.

Core Courses - Students take 9 hours of core coursework. INST 2350 (Introduction to Global Studies) and INST 2310 (Introduction to International Relations) provide the theoretical framework for the global and regional tracks. INST 4950 (Capstone) provides the culminating experience for students completing the B.A. degree in international studies and fulfills the COM3 writing requirement for the University Studies Program.

Area of Focus - Students will complete a minimum of 18 hours of coursework in two specific areas of focus, choosing a global and regional track. Students must complete a minimum of 9 hours in each track.

Global Tracks - Governance and Conflict Resolution; Economic Systems; Culture and Social Issues; Sustainable Development and the Environment

Regional Tracks - Africa and the Middle East; Asia and the Pacific Rim, Europe and the Former Soviet Union; Latin America

Global and regional tracks have suggested Gateway courses. Most Gateway courses fulfill University Studies requirements. All INST students are required to take the Regional Gateway course in their chosen region, either: INST 2230 (Introduction to Asian Studies), INST 2240 (Introduction to African Studies), INST 2250 (Introduction to Latin American

Studies), or INST 2280 (Introduction to European Studies)/POLS 2200 Politics of Europe and the EU. These courses fulfill the COM2 requirement for International Studies and counts towards the 9 hours required for the Regional Track.

Foreign Language - Students must complete 16 hours in a single foreign language or show an equivalent level of proficiency. Language courses must be conversational language courses. American Sign Language is not considered a foreign language.

Electives - Students must take 9 hours of elective courses from the international studies curriculum, 6 of which must be upper division. The following Gateway courses can count for the elective requirement: ANTH 1200, ECON 1000, INST 1060 or GEOG 1000, INST/POLS 1200, INST 1330.

All required courses for the major must be passed with a grade of C or better. There are numerous special topics courses offered during the academic year and these courses can fulfill the international studies requirements with approval from your adviser. Students are encouraged to satisfy the USP Q (quantitative reasoning) requirement by taking STAT 2070, Introductory Statistics for Social Sciences.

International Study Abroad and Internship Opportunities

All International Studies majors are strongly encouraged to consider taking part in a semester long study abroad program or a shorter-term faculty-led international fieldwork or study abroad courses taught by UW faculty (typically offered during the Summer and Winter breaks) as a way to earn course credit towards their International Studies degree. In addition, International Studies majors are also encouraged to consider participating in paid or unpaid international internship opportunities as a way of earning additional academic credit towards their International Studies degree. For more information on international study abroad exchanges, faculty-led fieldwork courses and internship opportunities, please visit the UW Abroad Office at: uwyo.edu/geo/eda/index.

Global Tracks - 9 hours of coursework from a single track. This list is not comprehensive; students are strongly encouraged to review the International Studies Newsletter each semester to see what additional qualifying courses are currently being offered.

Sustainable Development and the Environment

Suggested Gateway Courses: ENR 1100, ECON 1010, ECON 1020, GEOG 1000, GEOL 1600, SOC 1000

AGEC 4460 - Agriculture and Economic Development
 AGECE 4660 - Community Economic Development
 ANTH 4310 - Environmental Anthropology
 ECON 4700 - Economic Development
 ENR 2000 - Environment and Society
 GEOG 3030 - Geography and Development
 GEOG 3550 - Natural Hazards and Society
 GEOG 4420 - Tourism and Recreation
 GEOL 3500 - Global Change: A Geological Perspective
 GEOL 3600 - Earth and Mineral Resources
 GEOL 3650 - Energy: A Geological Perspective
 INST/AGEC 3860 - Econ of World Food/Ag
 INST 4060 - NGOs, Development, and Culture
 INST/SOC 4110 - Sociology of Development
 INST/POLS 4255 - Politics of Developing Nations
 INST 4475 - Sustainable Development & Environment
 INST 4580 - Gender, Global Change and Development
 MKT 4590 - Sustainable Business Practices
 POLS 4350 - Sustainable Development and Global Policy

Economic Systems

Suggested Gateway Courses: ECON 1000, ECON 1010, ECON 1020. NOTE: Some courses from this curriculum require ECON 3020.

AGEC 4460 - Agriculture and Economic Development
 AGECE 4660 - Community Economic Development
 AGECE 4880 - International Agricultural Trade, Markets and Policy
 BUSN 4540 - Global Business Issues
 ECON 4700 - Economic Development
 ECON 4720 - International Trade
 ECON 4740 - International Finance
 FIN 4460 - Multinational Finance
 INST/BUSN 2000 - Intro to International Business
 INST/GEOG 3050 - Economic Geography
 INST/AGEC 3860 - Economics of World Food and Development
 INST/SOC 4370 - Global Political Economy
 INST/MKT 4540 - International Marketing
 INST/ECON 4710 - Comparative Systems
 MKT 4590 - Sustainable Business Practices

Culture and Social Issues

Suggested Gateway Courses: ANTH 1200, SOC 1000
 ANTH 4300 - Anthropology of Religion
 ANTH 4350 - Medical Anthropology
 ANTH 4380 - Visual Anthropology

ART 4650 - International Study in Art
 COJO 3190 - Cross-Cultural Communication
 GEOG 4570 - Cultural Geography
 HIST 4405 - American Encounters to 1850
 HIST 4406 - American Encounters from 1850
 INST/SOC 3000 - Social Change
 INST/ANTH 3420 - Anthropology of Global Issues
 INST/HLSC 4100 - Global Public Health
 INST/WMST 4155 - Women, War and Health
 INST/WMST 4175 - Gender, Women and Health
 INST/WMST 4240 - Global Sex Work and Trafficking
 INST/ANTH 4350 - Culture Change
 INST 4590 - Women of India
 INST 4650 - Women, Gender and Migration
 INST/SOWK 4881 - Intl Social Welfare/Social Dev.
 ANTH/MUSC 3015 - Introduction to Music of the World's People
 MUSC 4050 - Advanced Studies in World Music
 RELI 2225 - History of Christianity
 RELI 2255 - Introduction to Judaism
 WMST 3500 - Gender and Society
 ZOO 4110 - HIV/AIDS

Governance and Conflict Resolution

Suggested Gateway Courses: GEOG 1000, POLS 1200, SOC 1000

ANTH 4320 - Political Anthropology
 CRMJ 4280 - Comparative Criminal Justice
 GEOG 4590 - Geography of Conflicts
 INST 3200 - Comparative Political Cultures
 INST/WMST 4155 - Women, War, and Health
 INST/SOC 4300 - The World System
 INST/POLS 4330 - American Foreign Relations
 INST/POLS 4340 - International Organizations
 INST 4360 - International Peace & Conflict
 INST 4375 - Transitional Justice
 INST/HIST 4380 - History of Human Rights
 INST 4455 - Drug War Geopolitics in the Americas
 INST/GEOG 4560 - Global Cities
 INST/HIST 4582 - 20th Century Foreign Relations
 PHIL 3250 - Global Justice
 POLS 3300 - Model United Nations
 POLS/GEOG 4013 - Political Geography
 POLS 4710 - Emerging Democracies
 POLS 4870 - Seminar: International Relations
 POLS 4875 - Seminar: Comparative Foreign Policy Analysis
 POLS 4890 - Seminar: Comparative Government and Politics

Regional Tracks - 9 hours of coursework from a single track. This list is not comprehensive; students are strongly encouraged to review the International Studies Newsletter each semester to see what additional qualifying courses are currently being offered.

Africa and the Middle East

Gateway Course for this Concentration: INST 2240, Introduction to African Studies

- AAST/INST 2240 - Introduction to African Studies
- AAST/ANTH/ART 2730 - African Creativity and Ritual
- AAST/HIST 3120 - Africa Since 1800
- AAST 3130 - Global Impact of African Cultures
- AAST 3670 - African Diaspora
- ENGL 2190 - African Literature
- HIST/RELI 2320 - History of Islam
- HIST 3220 - History of the Modern Middle East
- HIST/WMST 4335 - Women and Islam
- INST 3400 - Politics and Society of Turkey
- INST/AAST 4050 - Dev., Africa, and Culture
- POLS 3270 - Government and Politics of the Middle East
- RELI 2040 - Religions of the Middle East
- RELI 2450 - Traditional African Religion

Asia and the Pacific Rim

Note: The Asian Studies minor is different from this concentration. Gateway Course for this Concentration: INST 2230, Introduction to Asian Studies

- HIST 2040 - Imperial China
- HIST 2041 - Modern China
- HIST 2460 - Traditional Japan
- HIST 2461 - Modern Japan
- HIST 3400 - Mongol Empire
- HIST 4510 - Modern Far East: China, Japan and India
- INST 2230 - Introduction to Asian Studies
- INST/SOC 3100 - Chinese Society
- INST 4200 - China and Globalization
- INST 4250 - Economic Development in Asia
- INST/SOC 4680 - Shanghai: Past and Present
- POLS 4230 - Governments and Politics of Asia
- POLS 4240 - Culture, Society, Political Economy in East Asia
- RELI 2050 - Religious Landscapes of Asia
- RELI 2315 - History of Hinduism
- RELI 3340 - Mysticism, Yoga, and Enlightenment in the East
- RELI 3344 - Gods, Avatars, Heroes, and Mystics
- WMST 4590 - Women of India

Europe and the Former Soviet Union

Note: The European Studies minor is different from this concentration. Gateway Course for this Concentration: INST 2280, Introduction to European Studies, or INST 2200, Politics of Europe and the European Union

- FREN 3110 - Contemporary French Civilization
- GERM 3006 - 20th Century German Culture
- HIST/RELI 2080 - Holocaust
- HIST 2240 - History of Russia from 1855
- HIST 3110 - Modern Germany
- HIST 4170 - Europe in the 19th Century
- HIST 4180 - Europe in the 20th Century
- HIST 4270 - France: Old Regime and Revolution
- HIST 4280 - France Since 1814
- HIST 4290 - History of the Soviet Union
- HIST 4310 - World War II in Europe
- HIST 4315 - Central Europe and the Holocaust
- HIST 4320 - Memory and National Identity
- HIST 4330 - European Gender and Women's History
- POLS 2200 - Politics of Europe and the European Union
- POLS 3220 - Government and Politics of Russia and the FSU
- POLS 4220 - European Union
- RELI 4150 - Christianity, Jews, and Muslims in Iberia
- WMST 4330 - European Gender and Women's History

Latin America

Gateway Course for this Concentration: INST 2250, Introduction to Latin American Studies

- AAST 2410 - Survey of Afro-Caribbean Cultures
- GEOG 4500 - Landscapes of the Americas
- HIST 2380 - Latin America Civilization
- HIST 4492 - Indian Cultures of Latin America
- HIST 4495 - Colonial Mexico
- HIST 4496 - History of Mexico
- INST 2250 - Introduction to Latin American Studies
- INST/POLS 4290 - Inter-American Relations
- INST 4445 - Drug War Geopolitics in the Americas
- INST 4475 - Politics of Ntl. Resources in Latin America
- INST/LTST 4485 - U.S. Latino Diaspora
- INST 4490 - Ethical Trade in Latin America
- INST 4495 - Indigenous Social Movements of Latin America
- INST/LTST 4650 - Women, Gender and Migration

- POLS 2290 - Government and Politics of Latin America
- POLS 4890 - Populism and Liberal Democracy

General Requirements for the International Studies Major

A student must complete 36 hours of course work and 16 hours of foreign language.

Concurrent Major

A concurrent major is a second major pursued alongside the primary major. The majors can be in one or more colleges. One degree is awarded from the college of the primary major. University Studies requirements need only be satisfied once.

Dual Degree

A dual degree is a second degree pursued either in the same college as the first degree or in another college. University Studies requirements need only be satisfied once. Students must meet all the college and major requirements for both majors. Students must complete at least 30 credit hours (minimum 12 upper-division hours) beyond the credit hours required for the degree with the smallest number of credit hours required. An academic advisor for each degree is required.

Second Bachelor's Degree

Students pursuing a second bachelor's degree must earn a minimum of 30 additional credit hours from UW, 12 of which must be upper-division. A student must also fulfill all of the college and major requirements, however, University Studies requirements only need to be met once if the first degree is from UW.

Undergraduate Minors

Students can minor in 3 areas by fulfilling one of the following sets of requirements:

International Studies Minor

A minor in international studies requires 12 hours of a single foreign language and 15 hours of international studies curriculum, with a minimum of 9 hours at the 3000-level or above.

Asian Studies Minor

The Asian Studies Minor offers students the opportunity to engage in an interdisciplinary program of study of an Asian region or a single country. The program emphasizes a social science approach to the study of Asian history, politics, society, and culture with options to include foreign language and study abroad components towards completion of the Minor. For the purposes of this minor, Asia is defined

first and foremost as a geographic entity to include Western, Northern, Central, South and East Asian areas. Thus, for example, countries such as modern Turkey and areas such as the 'Middle East' can rightly be included in 'Asia' alongside areas more traditionally understood as part of Asia such as China and India.

Asian Studies Minor Course Requirements (18 credits)

If your primary major is in the College of Arts and Sciences, at least twelve (12) credit hours must be exclusive to the minor and not counted towards fulfilling major requirements. To count towards the minor, all courses must be completed with a grade of 'C' or better.

Gateway Course (3 Credit Hours) - All Asian Studies Minor students must complete one of two required Gateway courses, either INST 2230 - Introduction to Asian Studies (G/COM2) or POLS 3270 - Government and Politics of the Middle East, depending on their primary area of interest within Asia.

Asian Studies Area Courses (15 Credit Hours) - Asian Studies Minor students must complete a minimum of fifteen (15) additional credit hours from the following list of approved Asian Studies Area Courses. A minimum of nine (9) of these credit hours must be taken at the upper-division (3000+) level. In addition to the approved courses on this list, topics courses, Honors courses, or other special course offerings may count towards fulfilling Asian Studies Area Course requirements based on the approval of the student's designated minor advisor. Students are strongly encouraged to review the International Studies Newsletter each semester to see what Asian Studies Area courses are currently being offered.

Approved Asian Studies Area Courses

ART 2720 - Introduction to the Art and Culture of Islam
 ART 4650 - International Study in Art (Turkey/India)
 CHIN 1101 - Taste of China
 CHIN 2041 - Contemporary and Traditional Chinese Culture
 CHIN 3160 - See Movies, Touch China
 ENR 3300 - Environmental Policy, Conservation and Development in India
 HIST 2040 - Imperial China
 HIST 2041 - Modern China
 HIST/RELI 2320 - History of Islam
 HIST 2460 - Traditional Japan
 HIST 2461 - Modern Japan
 HIST 2470 - Civilization of India

HIST 3210 - The Islamic World in the Premodern Era
 HIST 3220 - History of the Modern Middle East
 HIST 3400 - Mongol Empire
 HIST/WMST 4335 - Women and Islam
 HIST 4520 - Modern Far East: China, Japan and India
 INST 2230 - Introduction to Asian Studies
 INST/SOC 3100 - Chinese Society
 INST 3400 - Politics and Society of Turkey
 INST 4200 - China and Globalization
 INST 4250 - East Asia Society and Economy
 INST 4560 - Global Cities
 INST/WMST 4590 - Women of India
 INST 4680 - Shanghai: Past and Present
 LANG 2150 - History and Culture of Manga
 LANG 3105 - Survey of Japanese Literature
 LANG 3140 - History and Culture of Anime
 LANG 4800 - Japanese Film
 POLS 3270 - Government and Politics of the Middle East
 POLS 4230 - Governments and Politics of Asia
 RELI 2040 - Religions of the Middle East
 RELI 2050 - Religious Landscapes of Asia
 RELI 2315 - History of Non-Western Religions
 RELI/PHIL 3320 - Eastern Thought
 RELI 3340 - Mysticism, Yoga, and Enlightenment
 RELI 3344 - Gods, Avatars, Heroes, and Mystics
 SOC 3050 - Japanese Society

Optional Asian Study Abroad Component

Asian Studies Minor students are also strongly encouraged to participate in a relevant study abroad program in the region of Asia to supplement their coursework at UW. Accordingly, up to six (6) hours of relevant study abroad credit may be counted towards fulfillment of the Asian Studies Area Course requirement on the approval of the student's designated minor advisor. Optional Asian Foreign Language Component Asian Studies Minor students are also strongly encouraged to learn an Asian foreign language as part of their progression towards completion of the Minor. Accordingly, up to eight (8) lower-division (1000-2000) credit hours of an Asian foreign language may be counted towards fulfillment of the Asian Studies Area Course requirement. 'Asian' languages at UW include Japanese, Chinese and Arabic. However, Asian Studies Minor, students need not necessarily be limited to the three languages currently taught at UW. On the approval of the student's designated minor advisor these optional language credit hours may be fulfilled by other Asian language

instruction at UW, other relevant in-country summer intensive programs, or language-focused study abroad programs.

European Studies Minor

The European Studies Minor offers students the opportunity to engage in an interdisciplinary program of study of a European region or a single country. The program emphasizes a social science approach to the study of modern European history, politics, society, and culture with options to include foreign language and study abroad components towards completion of the Minor. For the purposes of this minor, Europe is defined first and foremost as a geographic entity running from the Atlantic to the Urals and from Scandinavia to the Mediterranean and the Caucasus Mountains. Courses that transcend these boundaries should include the study of Europe in a prominent way to count toward the minor.

European Studies Minor Course Requirements (18 credits)

If your primary major is in the College of Arts and Sciences, at least twelve (12) credit hours must be exclusive to the minor and not counted towards fulfilling major requirements. To count towards the minor, all courses must be completed with a grade of 'C' or better.

Gateway Course (3 credit hours) - All European Studies Minor students must complete one of two required Gateway courses, either INST 2280 - Introduction to European Studies (COM2) or POLS 2200 - Politics of Europe and the European Union (COM2).

European Studies Area Courses (15 credit hours) - European Studies Minor students must complete a minimum of fifteen (15) additional credit hours from the following list of approved European Studies Area Courses. A minimum of nine (9) of these credit hours must be taken at the upper-division (3000+) level. In addition to the approved courses on this list, topics courses, Honors courses, or other special course offerings may count towards fulfilling Area Course requirements based on the approval of the student's designated minor advisor. Students are strongly encouraged to review the International Studies Newsletter each semester to see what European Studies Area courses are currently being offered.

Approved European Studies Area Courses

A&S 2200 - British Life and Culture
 FREN 2130 - Contemporary French Culture
 FREN 3110 - Contemporary French Civilization

FREN 4085 – Studies in French Culture
GERM 3006 – 20th Century German
Life and Civilization
GERM 3150 – German History and Culture
GERM 4265 – Divided Nation: Politics
and Culture in Germany 1945 – 1990
GERM 4285 – 20th/21st Century
German Film
HIST 2080 – Holocaust
HIST 2240 – History of Russia from 1855
HIST 3110 – Modern Germany
HIST 4170 – Europe: 19th Century
HIST 4180 – Europe: 20th Century
HIST 4190 – Europe: 1930 – Present
HIST 4195 – European Economic History
HIST 4270 – France: Old
Regime/Revolution
HIST 4280 – France Since 1814
HIST 4290 – History of the Soviet Union
HIST 4310 – World War II in Europe
HIST 4315 – History, Politics and Memory
of the Holocaust in Europe
HIST 4320 – Memory and National
Identity in 20th C Europe
HIST/WMST 4330 – European
Gender and Women’s History
HIST 4420 – Britain’s Global Empires
INST 2280 – Introduction to
European Studies
INST/POLS/SOC 4330 – The World System
INST 4380 – International History
of Human Rights
INST 4881 – International Social
Welfare and Social Development
POLS 2200 - Politics of Europe
and the European Union
POLS 3220 – Government and Politics
of Russia and the FSU
POLS 4215 – European Union
RELI 4150 – Christianity, Jews
and Muslims in Iberia
SPAN 3220 – Spanish Culture
and Civilization

Optional European Study Abroad Component

European Studies Minor students are also strongly encouraged to participate in a relevant study abroad program in the region of Europe to supplement their coursework at UW. Accordingly, up to six (6) hours of relevant study abroad credit may be counted towards fulfillment of the European Studies Area Course requirement on the approval of the student’s designated minor advisor.

Optional European Foreign Language Component

European Studies Minor students are also strongly encouraged to learn an European foreign language (other than English) as part of their progression towards completion of the Minor. Accordingly, up to eight (8) lower division (1000-2000) credit hours of an European foreign language may be counted towards fulfillment of the European Studies Area Course requirement. ‘European’ languages at UW include French, German, and Spanish. However, European Studies Minor students need not necessarily be limited to the three languages currently taught at UW. On the approval of the student’s designated minor advisor these optional language credit hours may be fulfilled by other European language instruction at UW, other relevant in-country summer intensive programs, or language-focused study abroad programs.

All required courses for the major must be passed with a grade of C or better. A course cannot simultaneously fulfill more than one major requirement.

Graduate Study

Students take the Plan A (thesis). Students must have a minimum of 26 hours of graded non-thesis coursework and 4 hours of thesis.

Program Specific Admission Requirements

Admission is open to all students holding a bachelor’s degree in any major. Applicants must have a minimum 3.0 GPA and a minimum GRE score of 150 in Verbal and 141 in Quantitative. The GRE may be waived if the applicant already possesses a graduate degree. In addition, the LSAT or GMAT may be used in lieu of the GRE, and scores for alternative tests will be evaluated on a case-by-case basis. Foreign students, who are non-native English speakers, must pass the Oral Proficiency Interview (OPI).

Program Specific Degree Requirements

Master’s Program

Students must meet three requirements: 1) Each student must take INST 5400. 2) Each student must take INST 5200. 3) Each student must demonstrate proficiency in a foreign language, accomplished in the course

of the program or from previous experience or coursework. Foreign language hours do not count toward the M.A. degree.

The program also offers a joint International Studies/Environment and Natural Resources degree. See www.uwo.edu/sppais for specific degree requirements.

Plan A (thesis)

Students are encouraged to construct, with the adviser’s approval, a program that focuses their own intellectual interests and career plans. To promote that end, students should be prepared to file a plan of study with the graduate adviser during the second semester of coursework.

No later than the second semester in residence, each student shall select a graduate committee to oversee his or her academic work. The committee will be chaired by the student’s major professor and must have at least one member from outside of The School of Politics, Public Affairs, and International Studies. Students also will prepare a thesis proposal and give a presentation of their preliminary project before the International Studies faculty and complete a thesis prospectus defense with their graduate committee by the end of their second semester.

Students must pass an oral examination at the completion of their program. Normally, examination will center on the thesis, but may also encompass coursework of the candidate.

Required Coursework

Advanced Theory Course
INST 5200 Graduate Proseminar in
International Studies
Research Methods Course
INST 5400 International Social Science
Research Methods

Graduate Minor in International Studies

A graduate minor in international studies provides students in graduate programs other than international studies with the opportunity to acquire a basic graduate-level familiarity with international relations, global processes and cultural diversity around the world. Students acquire a foundation in inter-governmental relations and research methodology. Beyond this, students work closely with a graduate director to fashion a program of study appropriate for their interests and post-graduate plans. The minor complements several other graduate degree programs.

Prerequisites for Admission

Declaration of an international studies minor is contingent on admission to a master's or doctoral degree program. Application is in the form of a letter of interest to the director of the program, including the background, anticipated course of study, and reason for seeking the minor. An interview with the director is also required. All prerequisites for entering the graduate program in international studies as a major apply to the minor with the exception of proficiency in a second language. Students must be prepared for coursework in international studies at the graduate level and be willing to take prerequisite courses if necessary.

Course and Committee Requirements

Graduate students minoring in international studies must satisfy the requirements of their graduate major and take twelve credits of guided graduate coursework in international studies. With the approval of the department of the graduate major, these twelve hours may also count toward the major. Students are required to take at least one advanced theory course (INST 5200) and one advanced research methods course. All courses will be determined in consultation with the program director.

International Studies (INST)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1040 [INST 2000]. Introduction to International Business. A broad study of the field of international business activity and theory and review major foreign environmental forces - financial, economic and socioeconomic, physical, sociocultural, political, legal, labor, competitive, and distributive - within the context of strategic management issues. Cross listed with INBU 1040. Prerequisites: ECON 1010.

1060. World Regional Geography. 3. [CS,G◀▶H] Covers the distributions, traits, and processes of the Earth's peoples and landscapes through the perspective of regional geography, which is the study of the spatial relationships of natural environments and human societies. Cross listed with: GEOG 1000.

1101. First-Year Seminar. 3. [(none)◀▶FYS]

1200. Non-Western Political Cultures. 3. [CS,G◀▶(none)] Gives students appreciation of non-western political cultures and how these cultures have created different political institutions and practices. Non-Western nations of Asia, Africa, and the Middle East are used as case studies. Cross listed with POLS 1200.

1250. Introduction to Comparative Government. 3. How do foreign states deal with the numerous challenges to their stability? Do institutions affect a state's approach to solving different problems? How do these different approaches affect policy? This course introduces students to different styles of governance and compare countries from around the world with reference to their political ideology. Cross listed with POLS 1250.

1330. World History since 1750. 3. [CS,G◀▶(none)] A history of the world's peoples and societies from 1750 to the present, with an emphasis on the diversity and interconnectedness of human life in the past.

2200. Study Abroad Preparation. 1. Prepares students for long-term study in a foreign country, by helping them to adapt to and understand the host country's culture, history, geography, political, and economic context. The course provides the practical information necessary for a foreign experience by exploring the principles of culture shock, ethnocentrism, cultural relativism, and the fundamentals of cross-cultural communication. Offered S/U only.

2230. Introduction to Asian Studies. 3. [G◀▶G COMM 2] Asia, the world's largest continent, is home to virtually half of humanity and a broad spectrum of peoples, languages, religions, and cultures. This course introduces the cultural, political, economic, and environmental landscapes of this diverse region.

2240. Introduction to African Studies. 3. [WB◀▶COM2] Confronts African stereotypes by exploring the continent's complex history and current affairs, with the help of different disciplinary perspectives, such as economics, political science, and anthropology. Equipped with the basics, students will be primed to tackle more advanced courses on Africa. Cross listed with AAST 2240.

2250. Introduction to Latin American Studies. 3. [(none)◀▶COM2] An introduction to the culture, history and politics of Latin America, from the US/Mexico border to the Antarctic ice fields of Patagonia. We will consider historical events and encounters from pre-Conquest times to contemporary crises. Our toolkit includes geography, anthropology, history, political economy, literature and cultural studies.

2260. Foreign Locale. 3-6 (Max. 9). A UW course taught primarily or entirely in a foreign locale.

2280. Introduction to European Studies. 3. [(none)◀▶COM2] This class explores the historical development of notions of community and difference, territories and borders, race and identity, and nationalism and post-national integration in Europe between 1789

and the present. It draws upon history, politics, geography, cultural studies, and anthropology. Cross listed with HIST 2280.

2310. Introduction to International Relations. 3. [G◀▶G] Analyzes the nature of international relations, emphasizing various methods of explaining and interpreting the behavior of nation-states. In doing so, the course illustrates the contemporary problems of world politics. Cross listed with POLS 2310.

2350. Introduction to Global Studies. 3. [CS,G◀▶(none)] Taking an interdisciplinary approach to the study of globalization, the course explores the links between trade, consumption, civil society, social justice, and ecological integrity.

2990. Topics in International Studies. 1-6 (Max. 15). Accommodates seminar series and/or course offerings including those by interdisciplinary teams and visiting faculty in international studies not covered by other courses.

3000 [2100]. Social Change. 3. [G◀▶G] Studies causes, processes and consequences of structural transformations in historical and comparative perspective. Reviews and assesses forces that account for sociological changes. Explores social change globally as well as in the U.S. Cross listed with SOC 3000. Prerequisite: SOC 1000.

3050 [G&R 3050]. Economic Geography. 3. Economic geography is the study of the location, distribution and spatial organization of economic activities across the globe; specifically how the economic realm is intertwined with other spheres of international social life. It explores the inherent logics and mechanisms of the capitalist system, and the social and spatial inequalities that result. Cross listed with INST 3050. Prerequisites: 6 hours of Social Sciences or International Studies. (Normally offered fall semester every other year)

3100. Chinese Society. 3. [G◀▶(none)] Reviews origins and consequences of Chinese revolution in comparative and cultural perspectives. Discusses influence of historical traditions and social structure on individual lives and behavioral patterns. Cross listed with SOC 3100. Prerequisite: SOC 1000.

3200. Comparative Political Cultures. 3. Histories and experiences of various societies have shaped their values, norms, beliefs, expectations, and attitudes. This class explores how the beliefs, values, and lifestyles of various societies shape peoples' views of their place in the politics of the state and of the state's place in their daily lives. Cross listed with POLS 3200. Prerequisite: POLS/INST 1200 or POLS/INST 1250 or permission of instructor.

3400. Politics and Society of Turkey. 3.

[G◀(none)] Examines the history of Turkey with an emphasis on its relationship with the Western world. Major topics include the Ottoman Empire; Ataturk and the founding of the Republic of Turkey; Turkey's role in the Cold War, Kurdish and other minority populations; the changing Turkish political landscape, the evolution of Islamist politics; and recent relations with the United States and European Union. *Prerequisites:* INST/POLS 1200 or 1250 and INST/POLS 2310 or permission of instructor.

3420. The Anthropology of Global Issues. 3.

Using anthropology's long-term, holistic and comparative approaches, the course examines key global issues, e.g., poverty, war, disease, environmental degradation, and terrorism from an anthropological perspective. Cross listed with ANTH 3420. *Prerequisite:* ANTH 1200.

3860. World Food, Ag, & Development. 3.

[G◀H] Explores economic approaches to improving nutrition, agriculture production, and the environment in developing regions of the world. Students gain understanding of complex conditions surrounding food security; institutions involved with food policy, aid, and production; environmental factors influencing agricultural production; inequality; and international cultural and societal food disparities. Cross listed with AGECECON 3860. *Prerequisite:* AGECECON 1010 or 1020. (Normally offered spring semester)

3933. African Philosophy. 3. [(none)◀H]

Examines the work of philosophers of Africa, of African descent and others who deal with the African diaspora. Topics include the nature of African philosophy and the African American struggle, African colonialism, philosophy, political philosophy and gender, traditional African thought. Restricted to junior or senior class standing. Cross listed with AAST/PHIL 3933. *Prerequisite:* A prior course in AAST, INST or PHIL.

4050. Development, Africa, and Culture. 3.

Focuses on the complex and checkered relationships between Western-inspired development and African cultures. Striking a balance among ethnographic case studies, theoretical lenses, and practical implications, understand what Euro-American efforts at foreign development, including contemporary globalization, look like from an African perspective. Provides an understanding of African expectations of development and developers. Dual listed with INST 5050; cross listed with AAST 4050. *Prerequisites:* junior standing and instructor consultation.

4060. NGOs, Development, and Culture. 3.

Non-governmental organizations (NGOs) have grown exponentially in number and are often viewed as the new and best vehicle for international development. By focusing on international non-governmental organizations (INGOs), in the contexts of Western aid to post-colonial societies and the role they play in the international aid system, the course explores INGOs from historical, global, and cultural perspectives. Dual listed with INST 5060. *Prerequisites:* junior standing and instructor permission.

4100. Global Public Health. 3. [G◀(none)]

Introduces students to the global context of public health, to principles underlying global health, and to dimensions of public health particular to international settings. It examines major themes and policies in global health and analyzes health problems and varying responses to them in different parts of the world. Dual listed with INST 5100; cross listed with HLSC 4100. *Prerequisite:* upper division student status.

4110. Sociology of International Development. 3.

Surveys development studies and rural change, including case studies of deliberate change efforts toward industrialization. Includes peasant modes of food production, daily life in subsistence, agriculture, shifts to commercial agriculture and global economy, ethical and critical issues of induced change and different approaches to development process and outcomes. Cross listed with SOC 4110. *Prerequisite:* SOC 1000 or ANTH 1200; SOC 3000 recommended. (Offered once a year).

4175 [4940]. Gender, Women, and Health. 3.

[CS,G◀(none)] Focuses on issues of gender, women and health, including the effects of gender bias in medical research and health care practices and policies. Health care issues of specific concern to women, both nationally and internationally will be examined. Cross listed with WMST 4175. *Prerequisite:* upper-division standing, lower division social or psychological science course. (Offered every other year)

4200. China and Globalization. 3.

The economic reforms in China have been political, cultural, and above all, global processes. Understanding these processes of economic reform tells us much about the role of government, culture, and globalization in the transition from socialism to capitalism, as well as about China's future role in the world. *Prerequisite:* POLS/INST 1200 or POLS/INST 1250 or HIST 2041 or SOC 3100.

4215. European Union. 3. Examines the European Union's history, institutional structures, and policy areas and explores the

positive and negative effects of European integration. Dual listed with INST 5215; cross listed with POLS 4215. *Prerequisites:* POLS 1200 or POLS 1250 or POLS 2310 or permission of instructor.

4240. Global Sex Work and Trafficking. 3.

[G◀(none)] Drawing upon case studies from Africa, Asia, the Americas and Europe, this course explores the gendered intersections of power and privilege through the lens of sex work, broadly defined as the exchange of intimacy for something of value, and trafficking, defined as coerced forms of sex work. Dual listed with INST 5240; cross listed with WMST 4240. *Prerequisite:* 3-6 hours of WMST or INST.

4250. East Asia Society and Economy. 3.

[G◀(none)]. Designed to explore key issues to the historical development of Asian countries from both comparative and international political economy perspectives. Distinctive political, social, and economic characteristics of these nations will be analyzed. Dual listed with INST 5250.

4255. Politics of Developing Nations. 3.

An analysis of the processes of political, economic and social change in the non-Western world. Dual listed with INST 5255; cross listed with POLS 4255. *Prerequisites:* 9 hours of political science or international studies, including POLS 1200 or POLS 1250 or POLS 2310, or permission of instructor.

4260. Democratization and Regime Change. 3.

Examines the theoretical/empirical research on causes of democratic transition and consolidation, including new waves of democratization and prospects for democratization in other contexts. Focus is given to a variety of theoretical/methodological perspectives such as the structural, strategic, social/cultural, institutional, and economic approaches. Dual listed with INST 5260; cross listed with POLS 4260. *Prerequisites:* 9 hours of political science or international studies, including POLS 1200, or POLS 1250, or POLS 2310, or permission of instructor.

4290. Inter-American Relations. 3.

Surveys inter-American system and idea of hemispheric unity. Analyzes major issues confronting inter-American community. Cross listed with POLS 4290. *Prerequisite:* 9 hours of political science, including POLS/INST 1200, or POLS/INST 1250, or POLS/INST 2310, or permission of instructor.

4315. History, Politics and Memory of the Holocaust in Europe. 3.

Offers students the opportunity to learn about the history of the Holocaust through travel to various sites in Central Europe where the events themselves

occurred, such as Berlin, Warsaw, Krakow and Auschwitz-Birkenau. Dual listed with INST 5315. Cross listed with HIST 4315. *Prerequisite:* 9 hours of HIST or INST.

4330. American Foreign Relations. 3. Analyzes American foreign policy decision-making process and selected contemporary foreign policy problems. Stresses political and institutional factors, along with analysis of policy options. Cross listed with POLS 4330. *Prerequisite:* 9 hours of political science or international studies including POLS 2310. (Normally offered once a year)

4340. International Organizations. 3. Encompasses development of world organizations, such as League of Nations, United Nations and its affiliate bodies. Also studies regional organizations and private international bodies. Cross listed with POLS 4340. *Prerequisite:* 9 hours of political science or international studies including POLS 2310.

4350. Culture Change. 3. Examines representative theories of change, factors involved, dynamics of modernization and applied anthropology. Identical to ANTH 4340. *Prerequisite:* ANTH 1200.

4360. International Peace and Conflict. 3. Why do nations go to war, engage in atrocities such as genocide, or move toward peace following conflict? Examines underlying processes behind both conflict and peace in the international system, including sources of conflict and ways conflicts might be moved toward sustainable peace. Dual listed with INST 5360; cross listed with POLS 4360. *Prerequisites:* 9 hours of political science or international studies including POLS 2310.

4370. Global Political Economy. 3. [G◀▶(none)] Examines the interaction of politics and the economy at the global level. Evaluates how political and economic decisions of one country or groups of countries affect institutions and life circumstances in others. Assesses the causes of consequences of globalization as rooted in political economy. Cross listed with SOC 4370. *Prerequisites:* SOC 1000 and junior standing or SOC 2100.

4375. Transitional Justice. 3. Mechanisms provide accountability for gross human rights violations and acts of mass atrocity within nations. Case studies are used to examine types of transitional justice interventions; tensions between demands of justice at local, national, and international levels; and transitional justice's role in post-conflict peace-building and reconciliation. Dual listed with INST 5375; cross listed with POLS 4375. *Prerequisites:* Consent of instructor. POLS 2310 strongly recommended.

4380. International History of Human Rights. 3. Examine the modern history of human rights in the global system, with particular emphasis on developments since the Second World War. Topics include the philosophy of human rights ideas; the histories of rights and rights violations in various regions; and the resulting international responses. Dual listed with INST 5380; cross listed with HIST 4380. *Prerequisites:* 9 hours of HIST or INST.

4385. Environment and Resource Conflict. 3. Drawing on key theory and contemporary real-world case studies this course explores how environmental change and the competition for scarce resources (such as food, water, oil, gems, and timber) have increasingly been linked to violent interstate and intrastate conflict and how such conflicts might be addressed, managed, or resolved through international and national action. Dual listed with INST 5385; cross listed with POLS 4385. *Prerequisite:* 9 hours of POLS or INST, including POLS/INST 2310.

4445. Drug War Geopolitics in the Americas. 3. This course examines illegal drug commodity chains and international efforts to police the drug trade in the Americas. It approaches the drug war through a "critical geopolitics" framework, also covering broader themes such as international politics, livelihoods, development, environmental justice, the global economy, race-based discrimination, public health, and resistance movements. Dual listed with INST 5445. Cross listed with POLS 4445. *Prerequisites:* 9 hours of international studies or social science coursework and junior standing.

4455. Energy Security. 3. Evaluates the geopolitical and socioeconomic issues surrounding the roots of energy insecurity and the global challenge to provide adequate, affordable, and accessible energy. Topics of study include the questions of energy nationalism, climate security, import dependence and transportation insecurities, the future of fossil fuels and alternative energies. Dual listed with INST 5455. Cross listed with POLS 4455. *Prerequisites:* 9 hours of INST or POLS, including INST/POLS 2310.

4475. Politics of Natural Resources in Latin America. 3. This course examines major trends in resource extraction, management, and conservation in Latin America, and the politics surrounding those trends, from theoretical, social, political, economic, and ecological perspectives and through a variety of grounded case studies. The theories and concepts we study are applicable to resource politics beyond Latin America. Dual listed with

INST 5475. Cross listed with POLS 4475. *Prerequisites:* 9 hours of international studies or social science coursework and junior standing.

4485. U.S. Latino Diaspora. 3. Combines classroom activities and a week-long stay abroad in examining the historical creation and contemporary spread of the Latino Diaspora from the Caribbean to the Yucatan and beyond. U.S. Latina/o history, multiculturalism, pan-Latino identity, assimilation, migration trends and natives responses are stressed. Cross listed with HIST/LTST 4485. *Prerequisite:* 9 hours of LTST, HIST, and/or INST related coursework.

4540. International Marketing. 3. Approaches the topic of international marketing from a managerial perspective. Exposure to world environmental characteristics and interdependencies, as well as objectives, strategies and tactics of marketing goods and services to various countries and cultures. Cross listed with MKT 4540. *Prerequisite:* MKT 3210 and junior standing.

4560. Global Cities. 3. [H] Globalization accelerates urbanization processes and creates a new type of city: the global city. This course investigates the debates over global cities, urban culture, new urban landscapes, urban planning practices, and social disparity. Using case studies from around the world, this class explores the diversity of global city formation processes. Dual listed with INST 5560; cross listed with GEOG 4560. *Prerequisites:* 9 hours of international studies or geography.

4580. Gender, Global Change, and Development. 3. Examines the global intersections of gender and public policy through its analysis of five central themes: [1] international development discourse in practice; [2] feminized labor and migration; [3] women's unequal access to resources (including land ownership and education); [4] agricultural production and sustainability; [5] health, reproduction and mothering. Dual listed with INST 5580; cross listed with WMST 4580. *Prerequisite:* 3-6 hours of WMST or INST courses.

4582. 20th Century U.S. Foreign Relations. 3. Studies Twentieth Century United States foreign relations with a focus on the Cold War period. Examines economic sources of policy decisions, elites and mass public opinion, as well as cultural, religious, ethnic, racial, and gender issues. Cross listed with HIST 4582; dual listed with INST 5582. *Prerequisite:* 9 hours of HIST or INST.

4590. Sustainable Business Practices. 3. A close look at what is happening in business practice today through the 'lens' of sustainability. Business models and systems will

be discussed and a framework proposed for assessing the ways in which principles of sustainability may be embedded within corporate strategy. Cross listed with MKT 4590; dual listed with INST 5590. *Prerequisites:* advanced business standing.

4650. Women, Gender & Migration. 3. From an international context and perspective, this course examines the gendered transformations immigrant women experience. Gender, theories of international migration, assimilation, race, ethnicity, and identity transformation serve as categories of analysis. From a cross-discipline comparative approach, we focus on women's lives to examine differences and similarities to complicate notions of immigration. Cross listed with AMST/LTST/WMST 4650. Dual listed with INST 5650. *Prerequisites:* Junior standing and 6 hours of AMST, LTST, INST, and/or WMST coursework or instructor approval.

4705. Global Terrorism. 3. Examines the concept, causes, incidence, types, consequences of, and responses to terrorism. Highlights the distinction between domestic and international terrorism and expands on the latter within the framework of the global environment. Cross listed with CRMJ 4705 and SOC 4705. *Prerequisites:* 9 hours in CRMJ, INST, or SOC coursework.

4710. Why Economies Succeed and Fail. 3. The study of the successes and failures of alternative economic systems; origins, similarities, and differences across capitalist, socialist, and communist systems, including the UW, Chinese, European, Russian, Latin American, and African economies. What does history teach us? Are there different tools to grow economy? Cross listed with ECON 4710. *Prerequisites:* ECON 3010; QA. (Offered based on sufficient demand and resources)

4881. International Social Welfare and Social Development. 3. Examines the basic framework of social welfare analysis and social development programming in the international arena, employing a multinational comparative analysis approach to explore the wide array of responses to social need across the globe. Students employ multinational comparative analyses to an area of social concern. Dual listed with INST 5881; cross listed with SOWK 4881. *Prerequisite:* POLS 1000; ECON 1010 recommended.

4950. Capstone in International Studies. 3. [WC◀COM3] Integrative course taught by an international studies faculty member. Students analyze a topic in depth from one of a variety of international studies approaches, organizing their research in concert with oth-

ers in the class. Emphasis is on the quality of research and presentation. *Prerequisite:* senior standing in international studies.

4970. Internship in International Studies. 1-6 (Max. 15). Integrates practical international experience with academic knowledge. Students are expected to participate in specifically assigned tasks and observe broader activities of sponsoring organization, and reflect on experience in written assignments. Satisfactory/unsatisfactory only. Dual listed with INST 5970. Available for S/U grading only. *Prerequisites:* 9 hours of international studies courses and consent of instructor.

4975. Readings in International Studies. 1-3 (Max. 9). Outlines special programs of readings in international studies to meet the needs of individual students. *Prerequisite:* 9 hours of international studies courses.

4990. Topics: _____ 1-6 (Max. 15). Accommodates seminar series and/or course offerings including those by interdisciplinary teams and visiting faculty in international studies not covered by other courses. Dual listed with INST 5990. *Prerequisites:* junior standing and consent of instructor.

5050. Development, Africa, and Culture. 3. Focuses on the complex and checkered relationships between Western-inspired development and African cultures. Striking a balance among ethnographic case studies, theoretical lenses, and practical implications, understand what Euro-American efforts at foreign development, including contemporary globalization, look like from an African perspective. Provides an understanding of African expectations of development and developers. Dual listed with INST 4050; cross listed with AAST 5050. *Prerequisites:* junior standing and instructor consultation.

5060. NGOs, Development, and Culture. 3. Non-governmental organizations (NGOs) have grown exponentially in number and are often viewed as the new and best vehicle for international development. By focusing on international non-governmental organizations (INGOs), in the contexts of Western aid to post-colonial societies and the role they play in the international aid system, the course explores INGOs from historical, global, and cultural perspectives. Dual listed with INST 4060; cross listed with AAST 5060. *Prerequisites:* junior standing and instructor permission.

5100. Global Public Health. 4. Introduces students to the global context of public health, to principles underlying global health, and to dimensions of public health particular to international settings. It examines major themes and policies in global health and analyzes health problems and varying responses to them

in different parts of the world. Cross listed with HLSC 5100, dual listed with INST 4100. *Prerequisite:* upper division or graduate standing.

5200. Graduate Proseminar in International Studies. 3-6 (Max. 6). Introduces students to different interdisciplinary approaches – perspectives, theories, and paradigms – within International Studies in order to explain the economic, historical, social, cultural, and political dimensions of international processes and issues. Students explore emerging trends in the global system and the most pressing challenges facing states, societies, and peoples. *Prerequisites:* graduate student status.

5210. Seminar in Human Security. 3-6 (Max. 6). A broad interdisciplinary approach to the study of human security within the field of international studies and global politics in order to explore the theories and processes that explain past and emerging patterns of behavior in the international system, as well as key aspects of local to global policymaking. Dual listed with POLS 5210.

5215. European Union. 3. Examines the European Union's history, institutional structures, and policy areas and explores the positive and negative effects of European integration. Dual listed with INST 4215; cross listed with POLS 5215. *Prerequisites:* POLS 1200 or POLS 1250 or POLS 2310 or permission of instructor.

5220. Graduate Seminar in Development. 3. This seminar will explore political challenges facing developing nations in the twenty-first century. The objective is to equip students from a broad range of backgrounds with a firm grounding in current development approaches and debates. *Prerequisite:* INST graduate standing.

5240. Global Sex Work and Trafficking. 3. Drawing upon case studies from Africa, Asia, the Americas and Europe, this course explores the gendered intersections of power and privilege through the lens of sex work, broadly defined as the exchange of intimacy for something of value, and trafficking, defined as coerced forms of sex work. Dual listed with INST 4240; cross listed with WMST 5240. *Prerequisite:* 3-6 hours of WMST or INST.

5250. East Asia Society and Economy. 3. Designed to explore key issues to the historical development of Asian countries from both comparative and international political economy perspectives. Distinctive political, social, and economic characteristics of these nations will be analyzed. Dual listed with INST 4250.

5255. Politics of Developing Nations. 3. An analysis of the processes of political, economic and social change in the non-Western world. Cross listed with POLS 5255; dual listed with

INST 4255. *Prerequisites:* 9 hours of political science or international studies, including POLS/INST 1200 or POLS/INST 1250 or POLS/INST 2310, or permission of instructor.

5260. Democratization and Regime Change. 3. Examines the theoretical/empirical research on causes of democratic transition and consolidation, including new waves of democratization and prospects for democratization in other contexts. Focus is given to a variety of theoretical/methodological perspectives such as the structural, strategic, social/cultural, institutional, and economic approaches. Dual listed with INST 4260; cross listed with POLS 5260. *Prerequisites:* 9 hours of political science or international studies, including POLS 1200, or POLS 1250, or POLS 2310, or permission of instructor.

5310. Seminar in Human Rights. 3. This seminar will examine rights from interdisciplinary perspectives, with an emphasis on a social science approach. *Prerequisite:* graduate standing.

5315. History, Politics and Memory of the Holocaust in Europe. 3. Offers students the opportunity to learn about the history of the Holocaust through travel to various sites in Central Europe where the events themselves occurred, such as Berlin, Warsaw, Krakow and Auschwitz-Birkenau. Dual listed with INST 4315. Cross listed with HIST 5315. *Prerequisites:* graduate standing.

5330. American Foreign Relations. 3. Analyzes American foreign policy decision-making process and selected contemporary foreign policy problems. Stresses political and institutional factors along with analysis of policy options. Dual listed with INST 4330. Cross listed with POLS 5330. *Prerequisite:* Consent of instructor. POLS 2310 strongly recommended.

5360. International Peace and Conflict. 3. Why do nations go to war, engage in atrocities such as genocide, or move toward peace following conflict? Examines underlying processes behind both conflict and peace in the international system, including sources of conflict and ways conflicts might be moved toward sustainable peace. Dual listed with INST 4360; cross listed with POLS 5360. *Prerequisites:* Consent of instructor. POLS 2310 strongly recommended.

5375. Transitional Justice. 3. Mechanisms provide accountability for gross human rights violations and acts of mass atrocity within nations. Case studies are used to examine types of transitional justice interventions; tensions between demands of justice at local, national, and international levels; and transitional justice's role in post-conflict peace-building and reconciliation. Dual listed with INST 4375;

cross listed with POLS 5375. *Prerequisites:* Consent of instructor. POLS 2310 strongly recommended.

5380. International History of Human Rights. 3. Examine the modern history of human rights in the global system, with particular emphasis on developments since the Second World War. Topics include the philosophy of human rights ideas; the histories of rights and rights violations in various regions; and the resulting international responses. Dual listed with INST 4380; cross listed with HIST 5380. *Prerequisites:* 9 hours of HIST or INST.

5385. Environment and Resource Conflict. 3. Drawing on key theory and contemporary real-world case studies this course explores how environmental change and the competition for scarce resources (such as food, water, oil, gems, and timber) have increasingly been linked to violent interstate and intrastate conflict and how such conflicts might be addressed, managed, or resolved through international and national action. Dual listed with INST 4385; cross listed with POLS 5385. *Prerequisite:* 9 hours of POLS or INST, including POLS/INST 2310.

5400. International Social Science Research Methods. 3. Introduces students to a wide variety of interdisciplinary social science methodologies that have proven especially conducive to international research. *Prerequisite:* graduate standing.

5445. Drug War Geopolitics in the Americas. 3. This course examines illegal drug commodity chains and international efforts to police the drug trade in the Americas. It approaches the drug war through a "critical geopolitics" framework, also covering broader themes such as international politics, livelihoods, development, environmental justice, the global economy, race-based discrimination, public health, and resistance movements. Dual listed with INST 4445. Cross listed with POLS 5445. *Prerequisite:* graduate standing.

5455. Energy Security. 3. Evaluates the geopolitical and socioeconomic issues surrounding the roots of energy insecurity and the global challenge to provide adequate, affordable, and accessible energy. Topics of study include the questions of energy nationalism, climate security, import dependence and transportation insecurities, the future of fossil fuels and alternative energies. Dual listed with INST 4455. Cross listed with POLS 5455. *Prerequisites:* 9 hours of INST or POLS, including INST/POLS 2310.

5475. Politics of Natural Resources in Latin America. 3. This course examines major trends in resource extraction, management, and conservation in Latin America, and the politics surrounding those trends, from theoretical, social, political, economic, and ecological perspectives and through a variety of grounded case studies. The theories and concepts we study are applicable to resource politics beyond Latin America. Dual listed with INST 4475. Cross listed with POLS 5475. *Prerequisite:* graduate standing.

5560. Global Cities. 3. [H] Globalization accelerates urbanization processes and creates a new type of city: the global city. This course investigates the debates over global cities, urban culture, new urban landscapes, urban planning practices, and social disparity. Using case studies from around the world, this class explores the diversity of global city formation processes. Dual listed with INST 4560; cross listed with GEOG 5560. *Prerequisites:* 9 hours of international studies or geography.

5580. Gender, Global Change, and Development. 3. Examines the global intersections of gender and public policy through its analysis of five central themes: [1] international development discourse in practice; [2] feminized labor and migration; [3] women's unequal access to resources (including land ownership and education); [4] agricultural production and sustainability; [5] health, reproduction and mothering. Dual listed with INST 4580; cross listed with WMST 5580. *Prerequisite:* 3-6 hours of WMST or INST courses.

5650. Women, Gender & Migration. 3. From an international context and perspective, this course examines the gendered transformations immigrant women experience. Gender, theories of international migration, assimilation, race, ethnicity, and identity transformation serve as categories of analysis. From a cross-discipline comparative approach, we focus on women's lives to examine differences and similarities to complicate notions of immigration. Cross listed with AMST/LTST/WMST 5650. Dual listed with INST 4650. *Prerequisites:* Junior standing and 6 hours of AMST, LTST, INST, and/or WMST coursework or instructor approval.

5582. 20th Century U.S. Foreign Relations. 3. Studies Twentieth Century United States foreign relations with a focus on the Cold War period. Examines economic sources of policy decisions, elites and mass public opinion, as well as cultural, religious, ethnic racial and gender issues. Dual listed with 4582; cross listed with HIST 4582/5582. *Prerequisite:* graduate standing.

5590. Sustainable Business Practices. 3.

A close look at what is happening in business practice today through the 'lens' of sustainability. Business models and systems will be discussed and a framework proposed for assessing the ways in which principles of sustainability may be embedded within corporate strategy. Cross listed with MKT 5590; dual listed with INST 4590. *Prerequisite:* advanced business standing.

5881. International Social Welfare and Social Development. 3. Examines the basic framework of social welfare analysis and social development programming in the international arena, employing a multinational comparative analysis approach to explore the wide array of responses to social need across the globe. Students employ multinational comparative analyses to an area of social concern. Dual listed with INST 4881; cross listed with SOWK 5881. *Prerequisite:* POLS 1000; ECON 1010 recommended.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrolled in a graduate degree program.

5970. Internship. 1-12 (Max. 24). Integrates practical international experience with academic knowledge. Students are expected to participate in specifically assigned tasks and observe broader activities of sponsoring organization, and reflect on experience in written assignments. Dual listed with INST 4970. *Prerequisites:* 9 hours of INST core courses and consent of instructor.

5975. Graduate Readings in International Studies. 1-3 (Max. 12). Outlines special programs of readings in international studies to meet the needs of individual students. *Prerequisite:* graduate standing.

5990. Topics: _____ 1-6 (Max. 15). Accommodates seminar series and/or course offerings including those by interdisciplinary teams and visiting faculty in international studies not covered by other courses. Dual listed with INST 4990. *Prerequisites:* junior standing and consent of instructor.

Arabic (ARBC)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1010. First Year Arabic I. 4. [(none)◀▶H]

Introduces beginning language learners to the Arabic writing system and provides opportunities for developing the four basic language skills (listening, speaking, reading, and writing) at word, phrase and sentence levels.

1020. First Year Arabic II. 4. [(none)◀▶H]

Introduces beginning language learners to the fundamentals of Modern Standard Arabic and provides opportunities for developing the four basic language skills (listening, speaking, reading, and writing) and practicing them in a variety of academic contexts. *Prerequisite:* ARBC 1010 or LANG 1010.

2030. Second Year Arabic I. 4. Aims to help students attain an elementary level of communication in Modern Standard Arabic through emphasis on listening, speaking, reading and writing. Students expand their vocabulary pool, gain a deeper understanding of Arabic language system, and develop their knowledge of Arab culture. *Prerequisite:* ARBC 1020 or LANG 1020.

2040. Second Year Arabic II. 3. Aims to help students attain a lower intermediate level of communication in Modern Standard Arabic with an emphasis on listening, speaking, reading, and writing. Students develop a wider vocabulary pool, gain a deeper understanding of Arabic morphological and grammatical rules, and get acquainted with different aspects of Arab culture. *Prerequisite:* ARBC 2030 or LANG 2030.

3050. Modern Arabic and its Dialects. 3.

This course exposes students to a range of Arabic dialects and explores their relationship with the Standard and each other. Additionally, this course provides students with opportunities to systematically practice and simulate a variety of dialectal excerpts. *Prerequisite:* ARBC 2030 or LANG 2030.

3060. Arabic Writing. 3. [WB◀▶COM2]

This intensive, lower intermediate, Arabic writing course helps students develop the skills acquired during the second year through analyzing and producing different text genres ranging from 200 to 500 words. It will move the student from writing letters, dialogs, reports, and summaries to longer narratives, descriptions, and opinion pieces. *Prerequisite:* ARBC 2040 or equivalent.

4990. Topics in Arabic. 3 (Max. 9). Accommodates seminar series and/or course offerings including those not provided by permanent course offerings. *Prerequisites:* ARBC 2040 and consent of instructor.

Political Science

Political Science is the study of how societies govern themselves and interact with one another. Courses of instruction in the Political Science major are offered in the following subfields: American politics, comparative government, international relations, political philosophy, public law, and public administration. Areas of focus include analysis of government structures and processes, citizens' influence on government, policy content, philosophical concepts and traditions, political systems of other states, and resolution of conflicts between nations. By developing critical thinking and analytical skills, the major prepares students for effective participation in the political process, successful careers in the public and private sectors, and further study in law, political science, and public administration.

In 1925, the state legislature passed a law requiring the study of the U.S. and Wyoming constitutions by all University of Wyoming students. Political Science 1000 satisfies this requirement, but the requirement can also be satisfied by special examination given periodically by the School of Politics, Public Affairs, and International Studies.

Learning Outcomes

We continuously and actively assess the Political Science undergraduate curriculum to ensure that the following learning outcomes are being met for each of our graduates:

1. Acquisition of a knowledge and understanding of the values, beliefs, and institutions that constitute governing processes;
2. Acquisition of an understanding of the distinctions among the major subfields of the discipline including: American politics and law; international relations; comparative politics; and political theory;
3. Development of a knowledge and understanding of citizens' roles within governing processes;
4. Acquisition of a knowledge of the theories and analytic skills necessary to evaluate conflicting arguments, assemble and

present appropriate evidence, and make reasoned conclusions from the evidence available;

5. The ability to communicate effectively, both orally and in written form.

Undergraduate Major

In addition to the university and college requirements listed elsewhere in this bulletin, a major in political science requires 33 department hours. Students are required to complete the following four introductory courses: POLS 1000; POLS 1200 or POLS 1250; POLS 2310; and POLS 2460 or POLS 3600. Students are also required to take at least one seminar in political science (and its prerequisites); 8 hours of a single foreign language or equivalent credit by examination as determined by the Department of Modern and Classical Languages; STAT 2070; and a minimum of 9 hours of upper division credit in political science. A maximum of 6 hours of internship credit may be applied toward the 33 hours required for the political science major. Only those political science courses in which a grade of C or better has been earned may be used to satisfy departmental requirements.

Most university studies courses and lower division political science courses should be completed prior to the junior year. Additional information about the political science major may be obtained from the School of Politics, Public Affairs, and International Studies: www.uwyo.edu/sppais.

5 Year B.A./M.A. Program in Political Science

The Political Science 5 Year B.A./M.A. Program offers highly qualified UW students with the opportunity to begin graduate study while they complete their bachelor's degree (whether B.A. or B.S.) and thereby earn a graduate degree more efficiently. Political science majors with a cumulative major GPA of 3.5 or higher may be invited to apply at the outset of the second semester of the junior year. Interested students will submit an application and 2 letters of recommendation, at least one from a political science faculty to be reviewed, along with unofficial, current UW transcripts, by the M.A. Director and Committee. Upon provisional acceptance into the program in the junior year, students will be required to take the GRE. GRE scores will be considered for full and final acceptance to the M.A. program, which will be made once the student has completed the bachelor's degree.

Provisional acceptance to the 5 Year B.A./M.A. program in Political Science will allow students to apply up to six credit hours of 5000-level courses toward both the B.A./B.S. and M.A. degree programs. To earn graduate-level credit, students must achieve at least a 3.000 in the course. By successfully completing up to six credit hours of graduate coursework during their senior year, these students will have demonstrated their ability to do graduate-level coursework as undergraduates, easing their transition into the Master's Program in Political Science. Interested students may reserve up to six additional credits for graduate study that do not apply to the undergraduate degree by securing appropriate approvals as explained in the Registrar's "Request to Reserve Coursework for Graduate Credit" prior to taking the coursework. Students will be granted the BA/BS upon completion of the credit hours required for the undergraduate degree in political science. Students must complete the BA/BS before formally entering the MA program. To remain in good standing in the program, students must maintain a cumulative and departmental GPA of 3.200 and earn at least a 3.000 in all 5000-level courses. Failure to meet the GPA requirements places a student on probation for one semester. If the GPA requirement is not met after that semester, the student will be suspended from the program. Students in the program are encouraged to take the Plan B option. Please see the Graduate Study section to find the degree requirements of the M.A. in Political Science.

Undergraduate Minors

The school offers optional undergraduate minors in American politics, international relations and comparative government, public law, and political theory. Eighteen hours are required in each minor, including 9 hours of upper-division courses and one seminar. A maximum of 3 hours of internship credit may be applied towards the 18 hours required for the political science minor. At least 12 credit hours in a minor must be from courses not counted toward the student's major. Information relating to specific courses fulfilling minor requirements may be obtained from the School of Politics, Public Affairs, and International Studies: www.uwyo.edu/sppais.

Students can minor in 4 areas by fulfilling one of the sets of requirements presented below. At least 12 credit hours in a minor must be from courses not counted toward the requirements of a degree major. A maximum of 6 hours of internship credit can be applied to the requirements for a minor.

American Politics Minor

A minor in American Politics requires POLS 1000 - American and Wyoming Government, either POLS 4850 - Seminar in American Political Institutions or POLS 4840 - Seminar in Public Law, and 12 hours from an approved list of courses, with a minimum of 9 hours at the 3000-level or above.

Approved American Politics Minor courses

- POLS 2000 - Current Issues in American Government
- POLS 2070 - Politics of State & Local Government
- POLS 2410 - Introduction to Public Administration
- POLS 2430 - Parties, Interest Groups, & Elections
- POLS 2450 - Politics & Media
- POLS 2490 - Topics in _____ (dept. approval required) (Max. 6)
- POLS 3100 - Politics and the Judicial Process
- POLS 3520 - Voting & Participation in America
- POLS 3550 - Political Communication
- POLS 3600 - American Political Thought
- POLS 4051 - Environmental Politics
- POLS 4052 - Federal Land Politics
- POLS 4100 - Constitutional Law: Institutional Powers
- POLS 4110 - Constitutional Law: Civil Liberties & Civil Rights
- POLS 4330 - American Foreign Relations
- POLS 4420 - Seminar in Public Administration (Max. 6)
- POLS 4430 - U.S. Presidency
- POLS 4435 - Presidential Elections
- POLS 4520 - Public Opinion
- POLS 4530 - U.S. Congress
- POLS 4550 - Internship in Government (dept. approval required)(1-6)
- POLS 4560 - Washington Semester Program (Max. 6)
- POLS 4710 - Topics in _____ (dept. approval required)(Max. 9)
- POLS 4720 - Workshop in Practical Politics (Max. 6)
- POLS 4840 - Seminar in Public Law (Max. 6)
- POLS 4850 - Seminar in American Politics and Institutions (Max. 6)

International Relations and Comparative Politics Minor

A minor in International Relations and Comparative Politics requires POLS 2310 - Introduction to International Relations, either POLS 1200 - Non-Western Political Cultures or POLS 1250 - Introduction to Comparative Politics, either POLS 4870 - Seminar in International Relations or POLS 4890 - Introduction to Comparative Government and Politics, and 9 hours from an approved list of courses, with a minimum of 6 hours at the 3000-level or above.

Approved International Relations and Comparative Politics Minor courses

- POLS 2200 - Politics of Europe and the European Union
- POLS 2290 - Government & Politics of Latin America
- POLS 2490 - Topics in _____ (dept. approval required) (Max. 6)
- POLS 3200 - Comparative Political Cultures
- POLS 3220 - Government & Politics of Russia and FSU
- POLS 3270 - Government & Politics of the Middle East
- POLS 3300 - Model United Nations (Max. 6)
- POLS 4013 - Political Geography
- POLS 4215 - European Union
- POLS 4230 - Government & Politics of Asia
- POLS 4255 - Politics of Developing Nations
- POLS 4260 - Democratization & Regime Change
- POLS 4290 - Inter-American Relations
- POLS 4330 - American Foreign Relations
- POLS 4340 - International Organizations
- POLS 4350 - Sustainable Development & Global Policy
- POLS 4360 - International Peace & Conflict
- POLS 4375 - Transitional Justice
- POLS 4445 - Drug War Geopolitics in the Americas
- POLS 4475 - Politics of Natural Resources in Latin America
- POLS 4600 - Political Violence
- POLS 4710 - Topics in _____ (dept. approval required)(Max. 6)
- POLS 4870 - Seminar in International Relations (Max. 6)
- POLS 4890 - Seminar in Comparative Government and Politics (Max. 6)

Political Theory Minor

A minor in Political Theory offers an opportunity for interdisciplinary study. Required are POLS 2460 - Introduction to Political Theory, POLS 3600 - American Political Thought, POLS 4810 - Seminar in Political Theory, and 9 hours from an approved list of courses in political science and other disciplines, with a minimum of 6 hours at the 3000-level or above.

Approved Political Theory Minor courses

- POLS 2330 - Environmental Ethics
- POLS 2490 - Topics in _____ (dept. approval required) (Max. 6)
- POLS 3050 - Athenian Democracy
- POLS 3610 - Classics in Environmental Thought
- POLS 3620 - Environmental Justice
- POLS 4090 - Anglo-American Jurisprudence
- POLS 4160 - Legal Philosophy
- POLS 4640 - Political Philosophy: Ancient & Medieval
- POLS 4650 - Political Philosophy: Modern
- POLS 4660 - Political Philosophy: Contemporary
- POLS 4710 - Topics in _____ (dept. approval required) (Max. 6)
- PHIL 2200 - Social & Political Philosophy (Max. 6)
- SOC 3900 - Social Theory

Public Law Minor

A minor in Public Law offers an opportunity for interdisciplinary study. Required are POLS 4100 - Constitutional Law: Institutional Powers, POLS 4110 - Constitutional Law: Civil Liberties & Rights, POLS 4840 - Seminar in Public Law, and 9 hours from an approved list of courses in political science and other disciplines, with a minimum of 3 hours at the 3000-level or above.

Approved Public Law Minor courses

- POLS 2490 - Topics in _____ (dept. approval required) (Max. 6)
- POLS 3100 - Politics and the Judicial Process
- POLS 4090 - Anglo-American Jurisprudence
- POLS 4160 - Legal Philosophy
- POLS 4710 - Topics in _____ (dept. approval required) (Max. 6)
- AGEC 3400 - Agricultural Law
- COJO 4500 - Mass Communication Law
- CRMJ 2210 - Criminal Law
- CRMJ 3110 - Criminal Courts & Processes

- CRMJ 4140 - Criminal Legal Procedure
- CRMJ 4350 / SOC 4350 - Sociology of Law
- CRMJ 4540 / WMST 4540 - Women, Crime, and Law
- CRMJ 4730 / PSYC 4730 - Psychology and Law
- HIST 4515 - American Legal History
- MGT 1040 - Legal Environment of Business

Teacher Education

The teacher certification program in Secondary Social Studies Education, with a concurrent major in Political Science is available through the College of Education. A minimum 2.500 UW grade point average and a 2.500 grade point average in Political Science and Social Studies content are required to change majors. Further information may be found under the College of Education section in this *Catalog*.

Major or Minor in Environment and Natural Resources

The Haub School of Environment and Natural Resources (ENR) offers a second major or minor for students interested in interdisciplinary training in the policy, legal, economic, scientific, ethical, and other perspectives associated with ENR challenges. The Haub School uses problem-based learning and interdisciplinary team teaching. Students of all disciplines are welcome to take classes in ENR or add ENR to their degree program. Contact the Haub School at (307) 766-5080, senr@uwo.edu, or www.uwo.edu/enr.

Graduate Study

The master of arts and the master of public administration are offered by the School of Politics, Public Affairs, and International Studies. The school's mission is to give graduate students an understanding of the theories and methods necessary for success in (1) research or in post-baccalaureate study in any of the subfields in political science, (2) high school teaching in social science, or (3) careers in policy analysis or public administration in local, state, or federal government, or international governmental or non-governmental organizations. Our graduate students have progressed to senior positions in government, the U.S. Foreign Service, and international organizations; they have pursued rewarding careers in education and the private sector; and they have advanced to Ph.D. programs in political science and related fields.

Program Specific Admission Requirements

Master of Arts in Political Science

Admission is open to all students holding a bachelor's degree in any major. Applicants must have a minimum 3.0 GPA. Foreign students, who are non-native English speakers, must pass the Oral Proficiency Interview (OPI).

Master of Public Administration (M.P.A.)

Admission is competitive and is open to all students holding a bachelor's degree in any major. Applicants must have a minimum 3.00 GPA, 2 letters of recommendation, a letter of intent, and a short analytic writing sample. Foreign students, who are non-native English speakers, must also pass the Oral Proficiency Interview (OPI). Only one class, POLS 5000, may be taken prior to full admission into the program with permission of the MPA director.

Program Specific Degree Requirements

Master's Programs

Master of Arts in Political Science

Plan A (thesis)

At least 30 hours of graduate credit, to include:

POLS 5510. Public Policy and Program Management.

POLS 5680. Research Methods for Political Science.

POLS 5684. Empirical Analysis for Public Administration.

POLS 5810. Seminar in Political Philosophy.

At least 6 additional hours of coursework in political science.

A maximum of 9 hours of coursework in disciplines other than political science.

A minimum of 4 hours thesis research.

A master's thesis demonstrating independent research, written under the supervision of the major professor.

An oral examination conducted by the graduate committee covering all coursework and the thesis.

No more than 6 hours of grades lower than 3.000 may be counted toward the minimum number of hours required for the degree.

Students must maintain a graduate GPA of 3.000.

Plan B (non-thesis)

At least 30 hours of graduate credit, to include:

POLS 5510. Public Policy and Program Management.

POLS 5680. Research Methods for Political Science.

POLS 5684. Empirical Analysis for Public Administration.

POLS 5810. Seminar in Political Philosophy.

At least 6 additional hours of coursework in political science.

A maximum of 12 hours of coursework in disciplines other than political science.

Plan B paper that reflects the quality but not scope of a master's thesis, written under the supervision of the major professor.

An oral examination conducted by the graduate committee covering all coursework and the Plan B paper.

No more than 6 hours of grades lower than 3.000 may be counted toward the minimum number of hours required for the degree.

Students must maintain a graduate GPA of 3.000.

Master of Public Administration Plan B (non-thesis)

Thirty-nine hours of graduate credit, to include:

21 hours of core credit,

6 hours of option-core credit,

12 hours of approved elective credit.

Significant administrative experience is required of all M.P.A. graduates.

If the M.P.A. student has little or no administrative experience an internship is required and will be included as 3 hours of the required elective credits.

Students entering the M.P.A. Program are expected to possess basic computer literacy, and to have access to a computer for such purposes as communicating with professors via e-mail, receiving M.P.A. Program memos, conducting research on the Web, retrieving articles from course documents libraries, working on course projects, and for conducting interactive/electronic class discussion.

Students must maintain a graduate GPA of 3.000.

Master of Public Administration/Juris Doctor

See the M.P.A. Director and/or the College of Law for information.

Students must be accepted to both programs.

Political Science (POLS)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

1000. American and Wyoming Government. 3. [V♦V] Introduction to the Constitutions and governmental processes of the U.S. and Wyoming. (Offered each semester)

1100. Wyoming Government. 1. [(none)♦V] Introduction to the Constitution and governmental process of Wyoming. Intended for students who have earned credit for American Government at an out-of-state college or by Advance Placement but have not fulfilled the Wyoming Constitution requirement of University Studies. Cannot be taken if the student has already taken POLS 1000.

1101. First-Year Seminar. 3. [(none)♦FYS]

1111. Issues in Political Science. 1-3 (Max. 3). [I,L♦(none)] Introduces students to Political Science through a study of a contemporary issue or problem from the perspectives of the various subfields.

1200. Non-Western Political Cultures. 3. [CS,G♦(none)] Gives students appreciation of non-western political cultures and how these cultures have created different political institutions and practices. Non-Western nations of Asia, Africa, and the Middle East are used as case studies. Cross listed with INST 1200.

1250. Introduction to Comparative Government. 3. How do foreign states deal with the numerous challenges to their stability? Do institutions affect a state's approach to solving different problems? How do these different approaches affect policy? This course introduces students to different styles of governance and compare countries from around the world with reference to their political ideology. Cross listed with INST 1250.

2000. Current Issues in American Government. 3. [CS♦(none)] Examines current political topics in the U.S. Focuses on key public policy problems, policy-making process and the final policy choice. Students must keep abreast of political events on daily basis and apply basic concepts in American government to current affairs. *Prerequisite:* POLS 1000.

2070. Politics of State and Local Government. 3. Studies politics, organizations, structures and processes of American state and local governments. *Prerequisite:* POLS 1000.

2200. Politics of Europe and the European Union. 3. [(none)♦COM2] Examines formal and informal aspects of politics in European countries and the European Union. *Prerequisite:* POLS 1200 or POLS 1250 or permission of the instructor.

2290. Governments and Politics of Latin America. 3. Studies chief cultural and historical factors influencing Latin American political process. Surveys major institutions and political patterns of the region. *Prerequisite:* POLS 1200 or POLS 1250 or permission of the instructor.

2310. Introduction to International Relations. 3. [G♦(none)] Analyzes the nature of international relations, emphasizing various methods of explaining and interpreting the behavior of nation-states. In doing so, the course illustrates the contemporary problems of world politics. Cross listed with INST 2310.

2330. Environmental Ethics. 3. Introduces students to ethical theory in environmental problem cases, and to philosophical issues in environmental philosophy. Ethical theories include natural law, utilitarianism, deontological and rights-based theories, relativism. Topics may include: conservation/preservation, resource management, pollution, overpopulation, factory farming, Leopold's land ethic, deep ecology, holism, eco-feminism. Cross listed with PHIL 2330.

2410. Introduction to Public Administration. 3. Deals with executive branches of governments in the U.S.: national, state and local. Considers organizational, political and policy-making aspects of each. Discusses administration in other forms of government, such as interstate compacts and regional agreements. *Prerequisite:* POLS 1000.

2420. Women and Politics. 3. Describes and compares status and political activity of women in America with those of women and men in other societies in order to explore causes, methods and results of political involvement by women. Cross listed with WMST 2420. *Prerequisite:* POLS 1000.

2430. Parties, Interest Groups and Elections. 3. [CS♦(none)] Studies nature and functions of political organizations in American democracy. Discusses origins and evolution of American parties, causes of interest group development, political socialization, political participation and voting behavior, as well as activities of interest groups within American society and political system. Emphasizes current trends regarding role of parties versus interest groups. *Prerequisite:* POLS 1000.

2450. Politics and Media. 3. Examines the media's coverage of current events, governmental institutions and electoral campaigns. Discusses effect of media on individuals' opinions and behavior. *Prerequisite:* POLS 1000.

2460. Introduction to Political Philosophy. 3. Surveys history of Western political thought including study of concepts and approaches to political philosophy. (Offered once a year)

2490. Topics In: __. 1-3 (Max. 6). Accommodates various specialized subjects not offered as regular courses. *Prerequisite:* POLS 1000.

3050. Athenian Democracy. 3. Examines democratic government in ancient Athens: its origins and development, its practical workings, how politics were conducted and power was gained and exercised, citizen participation, law courts, and evaluations of democracy in the ancient world and since. Cross listed with CLAS/HIST 3050. *Prerequisite:* WB or COM2.

3100 [2100]. Politics and the Judicial Process. 3. Analyzes courts and their personnel in the American political system, including examination of functions of courts, characteristics of judicial process, approaches to the study of judicial behavior, and role of courts as policy makers. *Prerequisite:* POLS 1000.

3200. Comparative Political Cultures. 3. Histories and experiences of various societies have shaped their values, norms, beliefs, expectations, and attitudes. This class explores how the beliefs, values, and lifestyles of various societies shape peoples' views of their place in the politics of the state and of the state's place in their daily lives. Cross listed with POLS 3200. *Prerequisite:* POLS/INST 1200 or POLS/INST 1250 or permission of instructor.

3220. Government and Politics of Russia and FSU. 3. Examines the political, economic and identity transitions of Russia and other states of the former Soviet Union during the post-communist era. Explores how current challenges relate to past Soviet practices. *Prerequisite:* POLS 1200 or POLS 1250 or permission of instructor.

3270. Governments and Politics of the Middle East. 3. Acquaints students with basic political, social and economic institutions of Middle Eastern countries. Emphasizes post-World War I developments, contemporary issues and problems. Special attention is given to politics of major nations in the Middle East such as Turkey, Iran, Israel, Egypt, Saudi Arabia, Iraq and Syria. *Prerequisite:* POLS 1200 or POLS 1250 or permission of instructor.

3300. Model United Nations. 1-3 (Max. 6). Focuses on the United Nations (UN) system and multilateral diplomacy to prepare students to participate in a Model UN simulation. Students learn to evaluate the UN system, learn strategies to address international problems, and develop skills to effectively represent a country in a role-playing exercise. *Prerequisite:* POLS 1200 or POLS 1250 or permission of instructor.

3520. Voting and Participation in America. 3. Examines the ways citizens participate in government, including campaigning, donating

money, and voting. Topics include mobilization by parties and campaigns, social and demographic differences in participation, explanations of voting behavior, civic responsibility, and the role of participation in a democracy. *Prerequisite:* POLS 1000.

3550. Political Communication. 3. Examines the intersection of politics and communication. For example, may cover politics and media, interpersonal political discussion, organizational and governmental political communication, political campaigns, politics and technology, etc. Moreover, it may cover the effects of political communication on individuals' opinions and behavior. Cross listed with COJO 3550. *Prerequisites:* COJO 1000, COJO 1040, or POLS 1000.

3600. American Political Thought. 3. [WB♦♦COM2] Examines key primary sources and traditions from the founding to present. *Prerequisite:* POLS 1000 or permission of instructor.

3610. Classics in Environmental Thought. 3. Surveys classic texts in environmental thought from the nineteenth century through the present. *Prerequisite:* POLS 1000.

3620. Environmental Justice. 3. Examines core philosophical understandings of justice and applies them to the environment through a variety of case studies, analytical essays and monographs. Cross listed with ENR 3620. *Prerequisite:* POLS 1000, POLS 2460, or POLS 3600, or permission of instructor.

3680 [2020]. Introduction to Empirical Political Analysis. 3. [(none)♦♦COM2] Introduces students to concepts, approaches and methodologies for empirical analysis of political problems. Students gain practical experience in communicating and presenting statistical analysis of of political data generated through surveys and other research techniques. *Prerequisites:* POLS 1000 and STAT 2050 or 2070, or permission of instructor.

4013. Political Geography. 3. Geographic space is subdivided into political units to aid human interaction and to facilitate political processes. Examines the spatial organization of political space and its effects upon political processes at varying geographic scales ranging from the local to international. Dual listed with POLS 5013; cross listed with GEOG 4013. *Prerequisite:* Completion of USP H requirement.

4051 [4050]. Environmental Politics. 3. Analyzes environmentalism as a political phenomenon. Provides students with a basic understanding of how to analyze political issues by: (1) examining the historical and contemporary issues that produce controversy over environmental matters; and (2) surveying the impacts of these issues on the formulation

and implementation of laws, policies, and regulations. Cross listed with AMST, ENR, GEOG and REWM 4051. Dual listed with POLS 5051. *Prerequisite:* POLS 1000.

4052. Federal Land Politics. 3. Examines the political forces that have shaped and continue to shape federal land policy and management. Explores the interactions between democratic decision making and science in the management of federal lands. Surveys the sources of controversy over federal land management and methods for harmonizing public demands with technical expertise. Cross listed with AMST/ENR/GEOG/REWM 4052. *Prerequisite:* POLS 1000.

4090. Anglo-American Jurisprudence. 3. Considers topics, such as functions of law in a democratic society; historical origins and growth of the common law as contrasted to the civil (code) law systems; and principal theories of nature and functions of law which have influenced development of English and American legal institutions. Dual listed with POLS 5090. *Prerequisite:* 9 hours of political science or philosophy, including POLS 1000.

4100. Constitutional Law: Institutional Powers. 3. Encompasses case-study analysis of judicial decisions and policies affecting constitutional interrelationships among the three branches of federal government, federal-state relations, as well as powers of the states and federal government in the area of social and economic regulatory laws. Dual listed with POLS 5100. *Prerequisite:* POLS 1000.

4110. Constitutional Law: Civil Liberties and Rights. 3. Encompasses case-study analysis of judicial decisions and policies of the constitutional interpretation of the 1st Amendment (freedom of speech, press, association and religion), privacy rights, the rights of the criminally accused, and civil rights (racial and gender equality). Dual listed with POLS 5110; cross listed with CRMJ 4110. *Prerequisites:* POLS 1000, POLS 3100 recommended.

4160. Legal Philosophy. 3. This course examines the philosophies that undergird the law, considering both ancient and modern legal thought. Throughout the course, both historical and contemporary examples will be used to illustrate the salient differences between philosophical approaches, to better articulate our understanding of the law. Dual listed with POLS 5160. *Prerequisite:* POLS 1000.

4215 [4220]. European Union. 3. Examines the European Union's history, institutional structures, and policy areas and explores the positive and negative effects of European integration. Dual listed with POLS 5215; cross

listed with INST 4215. *Prerequisites:* POLS 1200 or POLS 1250 or POLS 2310 or permission of instructor.

4230. Governments and Politics of Asia. 3. Studies political systems of East Asia. Analyzes impact of social and economic factors upon political institutions. Dual listed with POLS 5230. *Prerequisite:* POLS 1200 or POLS 1250 or POLS 2310 or permission of instructor.

4255. Politics of Developing Nations. 3. An analysis of the processes of political, economic and social change in the non-Western world. Cross listed with INST 4255; dual listed with POLS 5255. *Prerequisites:* 9 hours of political science or international studies, including POLS/INST 1200 or POLS/INST 1250 or POLS/INST 2310, or permission of instructor.

4260. Democratization and Regime Change. 3. Examines the theoretical/empirical research on causes of democratic transition and consolidation, including new waves of democratization and prospects for democratization in other contexts. Focus is given to a variety of theoretical/methodological perspectives such as the structural, strategic, social/cultural, institutional, and economic approaches. Dual listed with POLS 5260; cross listed with INST 4260. *Prerequisites:* 9 hours of political science or international studies, including POLS 1200, or POLS 1250, or POLS 2310, or permission of instructor.

4290. Inter-American Relations. 3. Surveys inter-American system and idea of hemispheric unity. Analyzes major issues confronting inter-American community. Cross listed with INST 4290; dual listed with POLS 5290. *Prerequisite:* 9 hours of political science, including POLS/INST 1200, or POLS/INST 1250, or POLS/INST 2310, or permission of instructor.

4330. American Foreign Relations. 3. Analyzes American foreign policy decision-making process and selected contemporary foreign policy problems. Stresses political and institutional factors, along with analysis of policy options. Dual listed with POLS 5330. Cross listed with INST 4330. *Prerequisite:* 9 hours of political science or international studies including POLS 2310.

4340. International Organizations. 3. Encompasses development of world organizations, such as League of Nations, United Nations and its affiliate bodies. Also studies regional organizations and private international bodies. Dual listed with POLS 5340. Cross listed with INST 4340. *Prerequisite:* Consent of instructor. POLS 2310 strongly recommended.

4350. Sustainable Development and Global Policy. 3. Considers in-depth meaning of "sustainable development" and trade-offs necessary to achieve it. Considers this issue

from global perspective through application of theories in economics, political science, international relations, technology studies and ethics. Dual listed with POLS 5350. *Prerequisite:* Consent of instructor. POLS 2310 strongly recommended.

4360. International Peace and Conflict. 3. Why do nations go to war, engage in atrocities such as genocide, or move toward peace following conflict? Examines underlying processes behind both conflict and peace in the international system, including sources of conflict and ways conflicts might be moved toward sustainable peace. Dual listed with POLS 5360; cross listed with INST 4360. *Prerequisites:* 9 hours of political science or international studies including POLS 2310.

4375. Transitional Justice. 3. Mechanisms provide accountability for gross human rights violations and acts of mass atrocity within nations. Case studies are used to examine types of transitional justice interventions; tensions between demands of justice at local, national, and international levels; and transitional justice's role in post-conflict peace-building and reconciliation. Dual listed with POLS 5375; cross listed with INST 4375. *Prerequisites:* Consent of instructor. POLS 2310 strongly recommended.

4385. Environment and Resource Conflict. 3. Drawing on key theory and contemporary real-world case studies this course explores how environmental change and the competition for scarce resources (such as food, water, oil, gems, and timber) have increasingly been linked to violent interstate and intrastate conflict and how such conflicts might be addressed, managed, or resolved through international and national action. Dual listed with POLS 5385; cross listed with INST 4385. *Prerequisite:* 9 hours of POLS or INST, including POLS/INST 2310.

4420. Seminar in Public Administration. 3 (Max. 6). Includes reading and research in selected public administration topics. Dual listed with POLS 5420. *Prerequisites:* POLS 1000 and consent of instructor.

4430. United States Presidency. 3. Analyzes office of president, its roles, development, relationships with other governmental agencies and problems in the contemporary world. Dual listed with POLS 5430. *Prerequisite:* POLS 1000.

4435. Presidential Elections. 3. Examines the process of electing the U.S. president. Topics include the roles of presidential primaries, caucuses, and conventions; campaign strategies; media coverage; citizen participation; the electoral college; and reforms. Dual listed with POLS 5435. *Prerequisite:* POLS 1000.

4445. Drug War Geopolitics in the Americas. 3. This course examines illegal drug commodity chains and international efforts to police the drug trade in the Americas. It approaches the drug war through a “critical geopolitics” framework, also covering broader themes such as international politics, livelihoods, development, environmental justice, the global economy, race-based discrimination, public health, and resistance movements. Dual listed with POLS 5445. Cross listed with INST 4445. *Prerequisite:* 9 hours of international studies or social science coursework and junior standing.

4455. Energy Security. 3. Evaluates the geopolitical and socioeconomic issues surrounding the roots of energy insecurity and the global challenge to provide adequate, affordable, and accessible energy. Topics of study include the questions of energy nationalism, climate security, import dependence and transportation insecurities, the future of fossil fuels and alternative energies. Dual listed with POLS 5455. Cross listed with INST 4455. *Prerequisites:* 9 hours of INST or POLS, including INST/POLS 2310.

4465. Survey of the Nonprofit Sector. 3. This foundational course is designed to give students of diverse backgrounds a common framework for understanding the nonprofit sector in the United States and globally. Students in this course will identify and interpret key theories, issues, and challenges in the nonprofit world and will consider the implications for practice. Dual listed with POLS 5465. *Prerequisite:* COM2.

4475. Politics of Natural Resources in Latin America. 3. This course examines major trends in resource extraction, management, and conservation in Latin America, and the politics surrounding those trends, from theoretical, social, political, economic, and ecological perspectives and through a variety of grounded case studies. The theories and concepts we study are applicable to resource politics beyond Latin America. Dual listed with POLS 5475. Cross listed with INST 4475. *Prerequisites:* 9 hours of international studies or social science coursework and junior standing.

4520. Public Opinion. 3. Deals with nature of a public in democracy and means of forming and manipulating public opinion. Emphasizes role of public opinion as essential ingredient of the policy-making process in popular government. Dual listed with POLS 5520. *Prerequisite:* POLS 1000.

4530. U.S. Congress. 3. Analyzes aspects of the U.S. Congress, including election of congressmen, legislative process, congressional-presidential relations, and the influence of political parties, interest groups, and constituents on the legislative process. Dual listed with POLS 5530. *Prerequisite:* POLS 1000.

4550. Internship in Government. 1-6 (Max. 6). Integrates practical political experience with academic knowledge. Students are expected to participate in specifically assigned duties and observe broader activities of the sponsoring organization; then, reflect upon this participation and observation in the form of written assignments. Internship credit can be earned for work in political campaigns, Wyoming Legislature or government services. Offered for S/U only. *Prerequisite:* 9 hours of political science.

4560. Washington Semester Program. 15. Provides students with paid internships in Washington, D.C., in either congressional offices or federal agencies. Selection into the program is very competitive and is made the semester prior to service. Offered for S/U only. *Prerequisites:* POLS 1000 and 6 additional hours of political science courses.

4600. Political Violence. 3. Examines causes and consequences of violence both among individuals and among nations. Dual listed with POLS 5600; cross listed with CRMJ 4600. *Prerequisite:* POLS 1000, or SOC 1000, or POLS 1200, or POLS 1250, or POLS 2310, or permission of instructor. (Normally offered every other year)

4640. Political Philosophy: Ancient and Medieval. 3. Surveys political philosophy from Classical Greek period to Machiavelli. Dual listed with POLS 5640. *Prerequisite:* POLS 2460, or POLS 3600, or consent of the instructor.

4650. Political Philosophy: Modern. 3. Surveys political philosophy from Machiavelli through the 19th century. Dual listed with POLS 5650. *Prerequisite:* POLS 2460, or POLS 3600, or consent of instructor.

4660. Political Philosophy: Contemporary. 3. Examines central developments in political philosophy that guide action in today’s world. Dual listed with POLS 5660. *Prerequisite:* POLS 2460, or POLS 3600, or consent of instructor.

4685. Program Evaluation and Policy Analysis. 3. Explores techniques for analyzing and evaluating public policy choices and impacts. Dual listed with POLS 5685. *Prerequisites:* STAT 2050, 2070 or equivalent and an introductory research methods course in a social science or related discipline.

4700. Readings in Political Science. 1-3 (Max. 6). Outlines special programs of readings in government and politics to meet needs of individual students. *Prerequisite:* 9 hours of political science.

4710. Topics in _____. 1-3 (Max. 9). Accommodates various specialized subjects not offered as regular courses. *Prerequisites:* POLS 1000 and 3 additional hours of political science.

4720. Workshop in Practical Politics. 1-3 (Max. 6). Familiarizes or strengthens participants in techniques of political effectiveness. Includes political organization, campaigning and persuasion. Guest speakers include public officials and experts in the field of practical politics. *Prerequisite:* 9 hours of political science.

4810. Seminar in Political Philosophy. 3 (Max. 6). [(none)◀COM3] Seminar in Political Philosophy; Encompasses reading and research on selected problems in political philosophy. Dual listed with POLS 5810. *Prerequisite:* POLS 2460, or POLS 3600, or consent of instructor.

4840. Seminar in Public Law. 3 (Max. 6). [(none)◀COM3] Includes reading and research on selected problems in public law. Dual listed with POLS 5840. *Prerequisite:* 9 hours of political science or related fields including POLS 1000 and consent of instructor.

4850. Seminar in American Politics and Institutions. 3 (Max. 6). [(none)◀COM3] Includes reading and research on selected U.S. government and politics problems. Dual listed with POLS 5850. *Prerequisite:* 9 hours of political science including POLS 1000 and consent of instructor.

4870. Seminar in International Relations. 3 (Max. 6). [(none)◀COM3] Encompasses reading and research in international law and politics. Dual listed with POLS 5870. *Prerequisites:* Consent of instructor. POLS 2310 strongly recommended.

4890. Seminar in Comparative Government and Politics. 3 (Max. 6). [WC,G◀C3] Researches selected topics in comparative government and politics. Dual listed with POLS 5890. *Prerequisite:* Consent of instructor. POLS 2310 strongly recommended.

5000. Survey of Public Administration. 3. Designed to introduce the beginning graduate student to the study and practice of public administration at all levels of government. Attention is also directed to specific functions and processes such as intergovernmental relations, budgeting, personnel, and regulation. *Prerequisite:* graduate status and consent of instructor.

5013. Political Geography. 3. Geographic space is subdivided into political units to aid human interaction and to facilitate political

processes. Examines the spatial organization of political space and its effects upon political processes at varying geographic scales ranging from the local to international. Dual list with POLS 4013; cross listed with GEOG 5013.

Prerequisite: graduate standing

5051. Environmental Politics. 3. Analyzes environmentalism as a political phenomenon. Provides students with a basic understanding of how to analyze political issues by: (1) examining the historical and contemporary issues that produce controversy over environmental matters; and (2) surveying the impacts of these issues on the formulation and implementation of laws, policies, and regulations. Dual listed with POLS 4051; cross listed with AMST/ENR/GEOG/REWM 4051. *Prerequisite:* POLS 1000.

5060. American Intergovernmental Relations. 3. Theory and practice of American federalism. *Prerequisite:* POLS 5000.

5080. Organizational Development. 3. Exposed to psychological concepts as they apply to organizations. Topics include organizational culture, motivations affecting a person's behavior in the workplace, personal interactions within organizations, and resolution of personal conflicts within the workplace. *Prerequisite:* POLS 5000.

5090. Anglo-American Jurisprudence. 3. Considers topics, such as functions of law in a democratic society; historical origins and growth of the common law as contrasted to the civil (code) law systems; and principal theories of nature and functions of law which have influenced development of English and American legal institutions. Dual listed with POLS 4090. *Prerequisite:* POLS 1000.

5100. Constitutional Law: Institutional Powers. 3. Encompasses case-study analysis of judicial decisions and policies affecting constitutional interrelationships among the three branches of federal government, federal-state relations, as well as powers of the states and federal government in the area of social and economic regulatory laws. Dual listed with POLS 4100. *Prerequisites:* POLS 1000.

5110. Constitutional Law: Civil Liberties and Civil Rights. 3. Encompasses case-study analysis of judicial decisions and policies of the constitutional interpretation of the 1st Amendment (freedom of speech, press, association and religion), privacy rights, the rights of the criminally accused, and civil rights (racial and gender equality). Dual listed with POLS 4110. *Prerequisites:* POLS 1000, POLS 3100 recommended.

5160. Legal Philosophy. 3. This course examines the philosophies that undergird the law, considering both ancient and modern legal

thought. Throughout the course, both historical and contemporary examples will be used to illustrate the salient differences between philosophical approaches, to better articulate our understanding of the law. Dual listed with POLS 4160. *Prerequisite:* graduate standing.

5210. Seminar in Human Security. 3-6 (Max. 6). A broad interdisciplinary approach to the study of human security within the field of international studies and global politics in order to explore the theories and processes that explain past and emerging patterns of behavior in the international system, as well as key aspects of local to global policymaking. Dual listed with INST 5210.

5215 [5220]. European Union. 3. Examines the European Union's history, institutional structures, and policy areas and explores the positive and negative effects of European integration. Dual listed with POLS 4215; cross listed with INST 5215. *Prerequisites:* Consent of instructor. POLS 2310 strongly recommended.

5230. Governments and Politics Of Asia. 3. Studies political systems of East Asia. Analyzes impact of social and economic factors upon political institutions. Dual listed with POLS 4230. *Prerequisite:* POLS 1000. POLS 3100 recommended.

5255. Politics of Developing Nations. 3. An analysis of the processes of political, economic and social change in the non-Western world. Cross listed with INST 5255; dual listed with POLS 4255. *Prerequisites:* 9 hours of political science or international studies, including POLS/INST 1200 or POLS/INST 1250 or POLS/INST 2310, or permission of instructor.

5260. Democratization and Regime Change. 3. Examines the theoretical/empirical research on causes of democratic transition and consolidation, including new waves of democratization and prospects for democratization in other contexts. Focus is given to a variety of theoretical/methodological perspectives such as the structural, strategic, social/cultural, institutional, and economic approaches. Dual listed with POLS 4260; cross listed with INST 5260. *Prerequisites:* 9 hours of political science or international studies, including POLS 1200, or POLS 1250, or POLS 2310, or permission of instructor.

5290. Inter-American Relations. 3. Surveys inter-American system and idea of hemispheric unity. Analyzes major issues confronting inter-American community. Dual listed with POLS 4290. *Prerequisite:* 9 hours of political science, including POLS/INST 1200, or POLS/INST 1250, or POLS/INST 2310, or permission of instructor.

5330. American Foreign Relations. 3. Analyzes American foreign policy decision-making process and selected contemporary foreign policy problems. Stresses political and institutional factors along with analysis of policy options. Dual listed with POLS 4330. Cross listed with INST 5330. *Prerequisite:* Consent of instructor. POLS 2310 strongly recommended.

5340. International Organizations. 3. Encompasses development of world organizations such as League of Nations, United Nations and its affiliate bodies. Also studies regional organizations and private international bodies. Dual listed with POLS 4340. *Prerequisite:* Consent of instructor. POLS 2310 strongly recommended.

5350. Sustainable Development and Global Policy. 3. Considers in-depth meaning of "sustainable development" and trade-offs necessary to achieve it. Considers this issue from global perspective through application of theories in economics, political science, international relations, technology studies and ethics. Dual listed with POLS 4350. *Prerequisite:* Consent of instructor. POLS 2310 strongly recommended.

5360. International Peace and Conflict. 3. Why do nations go to war, engage in atrocities such as genocide, or move toward peace following conflict? Examines underlying processes behind both conflict and peace in the international system, including sources of conflict and ways conflicts might be moved toward sustainable peace. Dual listed with POLS 4360; cross listed with INST 5360. *Prerequisites:* Consent of instructor. POLS 2310 strongly recommended.

5375. Transitional Justice. 3. Mechanisms provide accountability for gross human rights violations and acts of mass atrocity within nations. Case studies are used to examine types of transitional justice interventions; tensions between demands of justice at local, national, and international levels; and transitional justice's role in post-conflict peace-building and reconciliation. Dual listed with POLS 4375; cross listed with INST 5375. *Prerequisites:* Consent of instructor. POLS 2310 strongly recommended.

5385. Environment and Resource Conflict. 3. Drawing on key theory and contemporary real-world case studies this course explores how environmental change and the competition for scarce resources (such as food, water, oil, gems, and timber) have increasingly been linked to violent interstate and intrastate conflict and how such conflicts might be addressed, managed, or resolved through international and national action. Dual listed

with POLS 4385; cross listed with INST 5385. *Prerequisite:* 9 hours of POLS or INST, including POLS/INST 2310.

5400. Public Personnel Management. 3. Designed to integrate information about the political environment of personnel administration with problem solving exercises in such specific areas as job analysis, affirmative action, and flextime. A number of topics including the evolution of the civil service, the rights and responsibilities of governmental employees, the functions of public personnel management, and collective bargaining processes are also covered. *Prerequisite:* POLS 5000.

5410. Administrative Behavior and Theory of Organization. 3. An advanced course in the theory of organization and the workings of public agencies. *Prerequisite:* POLS 5000.

5420. Seminar In Public Administration. 3 (Max. 6). A reading and research course in selected topics in public administration. Dual listed with POLS 4420. *Prerequisites:* POLS 1000 and consent of instructor.

5430. United States Presidency. 3. Analyzes the office of the president, its roles, development, relationships with other governmental agencies, and problems in the contemporary world. Dual listed with POLS 4430. *Prerequisite:* POLS 1000.

5435. Presidential Elections. 3. Examines the process of electing the U.S. president. Topics include the roles of presidential primaries, caucuses, and conventions; campaign strategies; media coverage; citizen participation; the electoral college; and reforms. Dual listed with POLS 4435. *Prerequisite:* POLS 1000.

5440. Principles and Processes of Government Budgeting. 3. Analyzes the principles, processes and politics of the budgetary process in the U.S. It examines the various theories of budgetary decision-making, the politics of budgeting and budgetary reforms. *Prerequisite:* POLS 5000 and graduate standing.

5445. Drug War Geopolitics in the Americas. 3. This course examines illegal drug commodity chains and international efforts to police the drug trade in the Americas. It approaches the drug war through a “critical geopolitics” framework, also covering broader themes such as international politics, livelihoods, development, environmental justice, the global economy, race-based discrimination, public health, and resistance movements. Dual listed with POLS 4445. Cross listed with INST 5445. *Prerequisites:* graduate standing.

5450. Administrative Regulation. 3. Significant points of contact between government and business are stressed. Government activities designed to regulate and aid such economic

interests as business, labor, agriculture, and consumers are dealt with at length. *Prerequisite:* POLS 5000.

5455. Energy Security. 3. Evaluates the geopolitical and socioeconomic issues surrounding the roots of energy insecurity and the global challenge to provide adequate, affordable, and accessible energy. Topics of study include the questions of energy nationalism, climate security, import dependence and transportation insecurities, the future of fossil fuels and alternative energies. Dual listed with POLS 4455. Cross listed with INST 5455. *Prerequisites:* 9 hours of INST or POLS, including INST/POLS 2310.

5460. Public Administration and Law. 3. Focuses on various facets of the relationship between American public administration and law. Emphasis is placed on the emerging body of administrative law as a context for jurisprudential reasoning in administrative decision making. *Prerequisite:* POLS 5000.

5465. Survey of the Nonprofit Sector. 3. This foundational course is designed to give students of diverse backgrounds a common framework for understanding the nonprofit sector in the United States and globally. Students in this course will identify and interpret key theories, issues, and challenges in the nonprofit world and will consider the implications for practice. Dual listed with POLS 4465. *Prerequisite:* graduate standing.

5475. Politics of Natural Resources in Latin America. 3. This course examines major trends in resource extraction, management, and conservation in Latin America, and the politics surrounding those trends, from theoretical, social, political, economic, and ecological perspectives and through a variety of grounded case studies. The theories and concepts we study are applicable to resource politics beyond Latin America. Dual listed with POLS 4475. Cross listed with INST 5475. *Prerequisite:* graduate standing.

5480. Ethics In Government. 3. The student is introduced to the ethical nature and dilemmas of public administration in American constitutional government. Such topics are addressed as source of ethical obligation, role of loyalty, application of moral philosophy, constitutional theory and ethical obligation, relation of theory and practice, and methods of ethical reflection. *Prerequisite:* POLS 5000.

5500. Internship in Public Administration. 1-6 (Max. 6). Educationally-oriented assignments for work in selected public agencies, with tutorial types of supervision. Offered S/U only. *Prerequisite:* consent of instructor.

5510. Public Policy and Program Management. 3. An overview of governmental policy making processes in the U.S and the uses of applied policy analysis. *Prerequisite:* POLS 5000.

5520. Public Opinion. 3. Deals with natures of a public in a democracy and means of forming and manipulating public opinion. Emphasizes the role of public opinion as an essential ingredient of the policy-making process in popular government. Dual listed with POLS 4520. *Prerequisite:* POLS 1000.

5530. U.S. Congress. 3. Analyze aspects of the U.S. Congress, including election of congressmen, legislative process, congressional-presidential relations, and the influence of political parties, interest groups, and constituents on the legislative process. *Prerequisite:* POLS 1000.

5540. Public Policy Perspectives. 3. Acquaints students with the underlying structure and dynamics of public policy formulation, implementation, and evaluation at the state, local, and federal levels. Drawing on a number of analytic approaches, the course seeks to understand this complex political phenomenon in the context of the institutions that drive it. *Prerequisite:* graduate standing.

5560. Public Administration in Literature and Film. 3. Examines the ways novelists and directors have viewed public administration, the accuracy of portrayals, how views have changed, how novelists and directors have helped create and disparage the rise of the administrative state, and types of administrative arrangements favored. *Prerequisite:* POLS 5000.

5570. Graduate Readings. 1-3 (Max. 9). Special programs of readings of government and politics will be outlined to meet needs of individual students. *Prerequisite:* graduate standing or consent of instructor.

5600. Political Violence. 3. Examines causes and consequences of violence both among individuals and among nations. Dual listed with POLS 4600. *Prerequisite:* POLS 1000, or SOC 1000, or POLS 1200, or POLS 1250, or POLS 2310, or permission of instructor..

5640. Political Philosophy: Ancient and Medieval. 3. Surveys political philosophy from Classical Greek period to Machiavelli. Dual listed with POLS 4640. *Prerequisite:* POLS 2460, or POLS 3600, or consent of the instructor.

5650. Political Philosophy: Modern. 3. Surveys political philosophy from Machiavelli through the 19th century. Dual listed with POLS 4650. *Prerequisite:* POLS 2460, or POLS 3600, or consent of instructor.

5660. Political Philosophy: Contemporary. 3. Examines central developments in political philosophy that guide action in today’s world. Dual listed with POLS 4660. *Prerequisite:* POLS 2460, or POLS 3600, or consent of instructor.

5680. Research Methods for Political Science. 3. Introduction to methodology of empirical analysis appropriate for political science and public policy, including introduction to the philosophy of science, research designs, hypothesis formation, measurement, and data collection. *Prerequisite:* STAT 2050, 2070, 5070 or equivalent.

5681. Methods of Political Analysis. 3. Introduction to methods of analysis focusing on understanding the strengths and weaknesses of each method and practical issues arising during the analysis stage of research. Covers quantitative analysis through multiple regression, case study analysis, and archival/historical analysis. *Prerequisite:* STAT 2050, 2070, 5070 or equivalent.

5684. Empirical Analysis for Public Administration. 3. Designed for students in public administration to train them to make decisions based on empirical evidence in policy and management. Course draws concepts from system analysis, management science, operations research, and social science methodology to provide an understanding of various policy analysis and program management techniques across many applications. *Prerequisite:* POLS 5000.

5685. Program Evaluation and Policy Analysis. 3. Explores techniques for analyzing and evaluating public policy choices and impacts. Dual listed with POLS 4685. *Prerequisites:* STAT 5070 or equivalent and an introductory research methods course in social science or related discipline.

5690. Capstone in Public Management. 3. Integrates theories and concepts introduced in core and option-core courses, and emphasizes students' application of them to various administrative settings. *Prerequisite:* completion of all other core and option core requirements in the MPA Program.

5710. Topics In Political Science. 1-3 (Max. 9). Intended to accommodate various specialized subjects not offered as regular courses. *Prerequisite:* graduate standing.

5810. Seminar in Political Philosophy. 3. Encompasses reading and research on selected problems in political philosophy. Dual listed with POLS 4810. *Prerequisite:* POLS 2460, or POLS 3600, or consent of instructor.

5840. Seminar in Public Law. 3 (Max. 6). Includes reading and research on selected problems in public law. Dual listed with POLS 4840.

5850. Seminar in American Politics and Institutions. 3. Includes reading and research on selected U.S. government and politics prob-

lems. Dual listed with POLS 4850. *Prerequisite:* 9 hours of political science including POLS 1000 and consent of instructor.

5870. Seminar in International Relations. 3. Encompasses reading and research in international law and politics. Dual listed with POLS 4870. *Prerequisite:* Consent of instructor. POLS 2310 strongly recommended.

5890. Seminar in Comparative Government and Politics. 3. Researches selected topics in comparative government and politics. Dual listed with POLS 4890. *Prerequisite:* Consent of instructor. POLS 2310 strongly recommended.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Students are expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

Psychology

135 Biological Sciences Building,

(307) 766-6303

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Web site: www.uwyo.edu/psychology

Department Chair: Sean McCrea

Professors:

KAREN BARTSCH ESTES, B.S. Colorado State University 1981; M.A. Oxford University 1983; Ph.D. University of Michigan 1988; Professor of Psychology 2007, 1992.

MATTHEW J. GRAY, B.A. Creighton University 1993; M.S. Drake University 1995; Ph.D. University of Mississippi 2000; Professor of Psychology 2014, 2002.

CYNTHIA M. HARTUNG, B.S. University of Wisconsin-Madison 1990; M.A. University of Kentucky 1993; Ph.D. 1998; Professor of Psychology 2019, 2007.

SEAN M. McCREA, B.A. Bucknell University 1996; Ph.D. Indiana University 2002; Professor of Psychology 2019, 2009.

CHRISTINE L. McKIBBIN, B.S. Michigan State University 1991; M.S. University of North Texas 1994; Ph.D. 1997; Professor of Psychology 2019, 2007.

NARINA NUÑEZ, B.A. State University of New York at Cortland 1980; M.S. 1984; Ph.D. Cornell University 1987; Professor of Psychology 2000, 1987.

CAROLYN M. PEPPER, B.S. Western Michigan University 1989; M.A. State University of New York at Stony Brook 1992; Ph.D. 1995; Professor of Psychology 2011, 2002.

BENJAMIN M. WILKOWSKI, B.A. Ohio University 2002; M.S. North Dakota State University 2005; Ph.D. 2008; Associate Professor of Psychology 2014, 2008.

Associate Professors:

ROBIN A. BARRY, B.A. University of Michigan 1996; M.A. University of Iowa 2005; Ph.D. 2010; Assistant Professor of Psychology 2016.

JOSHUA D. CLAPP, B.A. University of Wyoming 2003; M.A. State University of New York at Buffalo 2008; Ph.D. 2012; Associate Professor of Psychology 2018, 2012.

KYLE P. De YOUNG, B.S. University of Iowa 2004; M.A. State University of New York at Albany 2008; Ph.D. 2011; Assistant Professor of Psychology 2016.

ALISON R. LOOBY, B.A. University of California-San Diego 2002; M.A. State University of New York at Albany 2007; Ph.D. 2011; Assistant Professor of Psychology 2016.

MEREDITH E. MINEAR, B.S. University of Illinois at Urbana-Champaign 1994; Ph.D. University of Michigan 2004; Associate Professor of Psychology 2019, 2013.

Assistant Professor:

KAYLA A. BURD, B.A. Hofstra University 2010; M.A. Cornell University 2016; Ph.D. 2018; Assistant Professor of Psychology 2020.

Academic Professional Lecturer:

CATHERINE P. CARRICO, B.A. Austin College; Ph.D. University of Northern Colorado; Clinical Associate Professor 2020.

TARA K. CLAPP, B.A. State University of New York at Buffalo 2005; M.S. Niagara University 2010; Associate Academic Professional Lecturer in Psychology 2018, 2012.

SCOTT FRENG, B.S. Black Hills State University 1995; M.A. University of South Dakota 1998; Ph.D. University of Nebraska - Lincoln 2001; Senior Lecturer in Psychology 2013, 2003.

MARIA I. KUZNETSOVA, B.A. Syktyvkar State University-Russia 2000; M.S. University of South Carolina-Aiken 2005; Ph.D. Virginia Commonwealth University 2011; Associate Academic Professional Lecturer in Psychology 2017, 2011.

Professor Emeritus

George Blau, David Estes, Charles J. Ksir, Karen B. Nicholas

The Department of Psychology offers coursework at several levels:

1. Introductory courses for students in other programs who wish an elementary knowledge of psychology.
2. Courses supportive of work in other majors.
3. An undergraduate major that is sufficiently flexible to allow students to prepare for graduate programs in psychology, professional schools (e.g. law, medicine) or for employment after graduation.
4. Graduate course work leading to the Ph.D. in clinical psychology, social psychology, cognition/cognitive development, or psychology and law.

Facilities are available for course work and laboratory experiences in areas of psychology such as cognition, personality, social, biological psychology, cognitive development, and psychology and law.

Students who wish to increase chances of employment related to their undergraduate majors should consult an adviser concerning areas of specialization within psychology.

Students planning graduate work in psychology should consult with their faculty adviser concerning career choices and development.

Learning Outcomes

We expect that our Psychology graduating students will have:

1. a basic knowledge of psychology and related fields.
2. the ability to evaluate the assumptions, purposes, methods, and results of psychological research and scholarship.
3. skills in teamwork, leadership, writing, speaking and listening, especially concerning psychology-related topics.

Credit by Examination

Credit by examination will be allowed only for PSYC 1000. The examination accepted is the College Level Examination Program (CLEP); the passing score is 50.

Advanced Placement

The psychology department will accept a score of 4 on the AP exam for credit in PSYC 1000, effective Fall 2015.

Undergraduate Major

A major requires a minimum of 33 semester hours and may not exceed 60 hours in psychology. Of these, 18 hours must be at the 3000 level or above. These upper-division courses must also be taken from at least two different members of the psychology department faculty listed in this *Catalog*.

Students must complete the following courses:

PSYC 1000 General Psychology

PSYC 2000 Research

Psychological Methods

Four of five cores:

Biological, PSYC 2210 Drugs and Behavior **or**

PSYC 2080 Biological Psychology

Developmental, PSYC 2300

Developmental Psychology

Clinical, PSYC 2340 Abnormal Psychology

Social, PSYC 2380 Social Psychology

Cognitive, PSYC 3120 Cognitive Psychology

Additionally **one** of the following restricted enrollment (seminar or writing intensive) courses is required: PSYC 4150, 4250, 4320, 4350, 4380, 4390, 4400, 4740, 4860.

Also required are 6 hours of anthropology, communication/journalism, criminal justice, economics, political science, or sociology; LIFE 1003 or 1010; and STAT 2050 or 2070.

One approved 3-4 credit hour STEM course: CHEM 1000, CHEM 1020, COSC 1010, COSC 1100, KIN/ZOO 2040, KIN/ZOO 2041, LIFE 2002, LIFE 2022, LIFE 2023, LIFE 2050, MATH 1050, MATH 1405, MATH 2200, MICR/MOLB 2021, PHYS 1050, PHYS 1110, STAT 2000, STAT 3050, or ZOO 3600.

Students who have an established UW GPA and who wish to change their major to Psychology, or to add Psychology as a major, will be required to have a UW GPA of at least 2.500.

For graduation, students must receive a C or better grade in all courses taken to satisfy department requirements.

Psychology courses taken 15 or more years ago will not be used to satisfy degree requirements.

Undergraduate Minors

The Department of Psychology offer two undergraduate minors: psychology and aging studies.

Psychology

A minor in psychology requires 18 semester hours in psychology. These must include PSYC 1000 or equivalent and 9 hours at the 3000- level or above. A grade of C or better is required in all minor courses.

Students seeking a minor must have 12 hours exclusive to the minor and not used in the major.

Aging Studies

A minor in aging studies requires 18 credit hours. These must include the following:

Core Courses

NURS 2240, FCSC 2110, HLSC 4985

Elective Courses - 9 credits

6 credits must be outside student major

Academic Standards

At least 12 credit hours in a minor must be from courses that are not being counted toward the student's major. No grade below a C is acceptable for courses applied to the minor.

Background Check

Students seeking the minor in Aging Studies will be required to obtain a background check as specified by College of Health Sciences policy. Please contact us for specific information.

Program Plan

Complete the Program Plan of Study with both your major academic advisor and your minor advisor.

Graduate Study

The Department of Psychology offers the doctor of philosophy in psychology with programs in clinical (APA accredited) psychology, social psychology, cognition/cognitive development, and psychology and law.

Program Specific Admission Requirements

The deadline for receipt of all application materials is December 1.

We only admit students one time per year. Our graduate students begin their programs of study in the fall semester.

Although our graduate programs technically consist of separate master's and doctoral degree components, only students who are

applying for, and who expect to complete, the doctoral program are considered for admission. That is, we do not offer a terminal master's degree.

Application materials include the application, one to two page personal statement, undergraduate and graduate (if applicable) transcripts, GRE scores (general and Advanced Psychology subject), curriculum vitae, and three letters of recommendation. An application fee of \$50 is required.

Applications are evaluated based on the applicants' academic qualifications (e.g., GRE scores, undergraduate GPA) and interests. Particular attention is paid to the goodness of fit between the applicant's expressed interests and the particular strengths and offerings of our program.

Our program does not employ a set of formal "cut-offs" with regard to any of the quantitative application elements (e.g., GRE scores or undergraduate/graduate GPA). Often a strong record in one area may make up for a weakness in another area. Applicants interested in information on the qualifications of admitted students should consult the student summary data (www.uwyo.edu/psychology).

Program Specific Graduate Assistantships

Applicants are considered for graduate assistantships at the time of admission. Graduate students typically receive some departmental financial support for the first four years.

Program Specific Degree Requirements

Master's Programs *Plan A (thesis)*

In addition to the general requirements specified in this *Catalog*, the following are required: (1) successful completion and oral defense of a thesis; (2) PSYC 5060. Statistical Methods in Psychology – 3 hours or STAT 5050. Statistical Methods in Biological Science – 3 hours; PSYC 5300. Applied Multivariate Analysis – 3 hours or STAT 5055. Statistical Methods for Biologists II – 3 hours; PSYC 5520. Research Design in Psychology – 3 hours; (3) at least 9 hours in 5000-level courses exclusive of those listed above and exclusive of research and thesis research credit.

A minimum of 30 semester hours is required (26 coursework hours and 4 thesis hours).

Doctoral Programs *Clinical Psychology*

Students complete a four-year, on-campus sequence of required courses covering core areas of psychology and clinical competency. In addition, the following are required: successful completion of a thesis, a preliminary comprehensive examination, a dissertation, two summer clerkships, and a full year APA accredited internship.

Social Psychology, Cognition/Cognitive Development, or Psychology and Law

Students complete course requirements in topics designated as core areas of psychology, a preliminary comprehensive examination, and a research-based dissertation.

Psychology (PSYC)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1000. General Psychology. 3. [CS◀▶H] Surveys the field of psychology through lectures, class discussion and assigned readings. Includes development of behavior, physiological mechanisms of behavior, perception, motivation and emotion, learning, intelligence, individuality and personality and mental health.

2000. Research Psychological Methods. 4. [WB◀▶(none)] Introduces some of the methods of investigating psychological questions. Exposure to various research strategies ranging from observational to experimental, using representative laboratory exercises, lectures, readings, films and demonstrations. Requires written and oral reports. May be used to satisfy department's written and oral communication requirement for majors. Laboratory two hours per week. *Prerequisites:* A grade of C or better in PSYC 1000, WA or COM1, STAT 2050 or 2070.

2080. Biological Psychology. 3. Introduces biological bases of behavior. Includes ethology and comparative behavior, psychobiological development, physiological and sensory mechanisms of behavior, and evolution and behavioral genetics. Presents basic structural and functional properties of the nervous system. *Prerequisites:* A grade of C or better in PSYC 1000 and general biology. (Normally offered fall semester)

2210. Drugs and Behavior. 3. Surveys drugs which affect behavior, emphasizing both psychotherapeutic agents and drugs with abuse potential. Includes brief introduction to the chemistry of the brain and how drugs may

have their effects. Behavioral, social, historical and medical aspects of each major class of psychoactive drugs are discussed. *Prerequisite:* A grade of C or better in PSYC 1000.

2300. Developmental Psychology. 3. Introduces psychological development, including age-related changes in thinking, emotion, and behavior. Major theories, methodologies, and empirical discoveries are surveyed in an exploration of developments beginning with conception, with emphasis on social, affective, and cognitive developments in childhood and infancy and their implications for policy and practice. *Prerequisite:* A grade of C or better in PSYC 1000. (Normally offered spring semester)

2340 [4340]. Abnormal Psychology. 3. Provides a general overview of abnormal behavior, emphasizing types, etiology and treatment methods. *Prerequisite:* A grade of C or better in PSYC 1000. (Normally offered spring semester)

2380 [4755]. Social Psychology. 3. Examines how peoples' thoughts, feelings, and behaviors are influenced by the presence of others. Course will cover a broad range of theories and research in social psychology. *Prerequisite:* A grade of C or better in PSYC 1000. (Normally offered fall semester)

3120 [4120]. Cognitive Psychology. 3. Deals with higher mental processes that are primarily unique to human beings from theoretical and research orientations. Emphasizes interrelationships between various cognitive processes and continuity of those processes with perceptual and non-cognitive activities. Discusses how information is processed and remembered. *Prerequisite:* A grade of C or better in 6 hours of psychology including PSYC 1000. (Normally offered spring semester)

3150. Moral Development. 3. Students explore the vast psychological literature on moral development in affect, cognition and behavior from infancy to adulthood. Topics covered include major developmental theories, research methodologies, current scientific knowledge and its relationship to issues of cultural diversity, social policy and education. *Prerequisite:* A grade of C or better in PSYC 1000, junior/senior standing or consent of the instructor.

3250. Health Psychology. 3. Provides overview of growing partnership between psychology and health care, including history of psychology in health care; theoretical foundations of health and illness; intervention and research techniques; stress and high risk behaviors (e.g., substance abuse, eating behaviors, AIDS); psychology's contribution to improving outcomes and quality of life in

chronic and life-threatening behaviors. Cross listed with NURS 3250. *Prerequisite:* A grade of C or better in PSYC 1000.

3300. Psychology of Gender. 3. In this course, we will examine a variety of psychological theories and research on the experiences and behaviors of men and women. We will study attitudes about gender, theories of gender development, and research about similarities and differences between men and women. Cross listed with WMST 3300. *Prerequisite:* A grade of C or better in PSYC 1000.

4040. Cognitive Neuroscience. 4. Examines the underlying neural bases of higher cognitive functions in humans, including attentions, language, motor control, navigation, emotions, and memory, as well as neuroanatomy fundamentals and neuroscience methods such as fMRI and ERP. Lecture and lab components. *Prerequisite:* A grade of C or better in PSYC 2080 or PSYC 3120 or ZOO 4280.

4070. Motivation. 3. Covers classic and contemporary theories and research concerning motivation and the pursuit of goals. Discusses the study of motivation from a variety of perspectives, including biological, environmental, and psychological. Considers the role of emotion in motivational processes. *Prerequisite:* C or better in 6 hours in psychology.

4080. Physiological Psychology. 4. [SB◀(none)] Examines physiological mechanisms of behavior, strongly emphasizing neural and hormonal processes. Includes fundamentals of neuroanatomy and evolution of the nervous system, basic neurophysiology, sensory and motor processes, as well as the physiology of emotion, motivation, learning and memory. Lecture three hours per week. Laboratory two hours per week. *Prerequisites:* A grade of C or better in 6 hours of psychology and LIFE 1000, 1003, or 1010 or an introductory zoology course.

4150. Cognitive Development. 3. Examines cognitive development from infancy through adolescence. Explores, through lecture, discussion and projects, major theories and current empirical research on cognitive development, as well as implications for social and educational policies concerning children. *Prerequisite:* A grade of C or better in 9 hours of psychology, including child psychology course.

4200. Sensation and Perception. 3. Examines behavioral and physiological processes involved in sensation and perception. Discusses each of the sensory systems, emphasizing their physiology and role in perceptual processing. *Prerequisite:* C or better in 6 hours in psychology.

4250. Psychological Aspects of Chronic Illness. 3. Investigates the impact of chronic physical illnesses on diagnosed children and

adults, their families, and society. Emphasizes effects of illnesses on psychological adaptation and quality of life. Should be of particular interest to helping professionals and health care workers. *Prerequisites:* A grade of C or better in PSYC 1000 and 3250.

4300. Adolescent Development. 3. Examines the developmental changes that occur during adolescence. Considers physical and physiological growth; intellectual, cognitive, academic and vocational development, changes in attitudes, interests and activities; and development of interpersonal relationships. *Prerequisite:* A grade of C or better in PSYC 1000.

4310. Developmental Psychopathology. 3. Provides basic understanding of developmental psychopathology. Examines characteristics, etiology, assessment and treatment of psychological disorders in children including autism, mental retardation, anxiety, depression, attention, learning, and conduct problems. *Prerequisite:* A grade of C or better in PSYC 1000 and PSYC 2300 or FCSC 2121 or EDST 2450.

4320. Intellectual Disability. 3. Acquaints students with all aspects of intellectual disability including assessment, diagnosis and classification, etiology, and associated health and mental health difficulties. Prevention, educational and psychological intervention, family adaptation, and community involvement are also addressed. *Prerequisite:* A grade of C or better in PSYC 1000 and PSYC 2300 or 4300 or FCSC 2121 or EDST 2450.

4350. Psychology of Adulthood. 3. Examines theories and research on psychological development from early adulthood to the end of life, with special emphasis on positive development, successful aging, and methodological issues in the study of adult development. *Prerequisite:* A grade of C or better in PSYC 1000.

4370. Criminal Psychopathology. 3. Provides an overview of current theories and empirical evidence concerning relationship between psychological disorder and criminal behavior. Examines various clinical syndromes and their role in biological, social and psychological genesis of crime, as well as the concept of criminal responsibility. Cross listed with CRMJ 4370. *Prerequisite:* C or better in 6 hours in psychology.

4380. Death and Dying. 3. Designed to provide a comprehensive overview of the field of thanatology. Death is considered from both an individual and sociocultural perspective. Aims to provide solid ground in research, methods, and theory of end-of-life issues and to encourage contemplation of personal and professional

applications of death studies. *Prerequisites:* A grade of C or better in PSYC 1000 and junior/senior standing.

4390 [3390]. Personality Science. 3. Examines the contemporary science in personality psychology, with a focus on the genetic, biological, social, cognitive, and affective variables which interact to influence individual differences and personality coherence. *Prerequisite:* A grade of C or better in PSYC 1000 and PSYC 2300 or PSYC 2340 or PSYC 2380.

4400. Principles of Psychological Testing. 3. Encompasses basic concepts, principles and procedures of psychological testing, with a lecture, discussion, laboratory project approach. Emphasizes nature and uses of test reliability, validity, norms and transformations, selecting and evaluating tests, test interpretation models and professional ethics in test use. Lecture three hours per week. *Prerequisites:* A grade of C or better in 6 hours of psychology and STAT 2050 or 2070.

4500. Introduction to Clinical Psychology. 3. Provides students with general introduction to clinical psychology as a subarea of psychology. Deals with the search for, and applications of, psychological principles and methods aimed at assessing and explaining unique or special problems of the individual, group or family, assisting client(s) to function more meaningfully and effectively, and helping to prevent future problems. *Prerequisite:* A grade of C or better in PSYC 2340.

4730. Psychology and Law. 3. Exposes students to the application of psychological principles to problems in law. Emphasizes the American trial system, correction systems and civil commitment. Cross listed with CRMJ 4730. *Prerequisite:* A grade of C or better in 6 hours in psychology.

4740. Advanced Social Psychology. 3. [WC◀(none)] Concentrates on critical assessment of interpersonal behavior. Students are expected to become familiar with data gathering, analysis and reporting procedures commonly used in contemporary social psychology. *Prerequisites:* A grade of C or better in PSYC 2000 and 2380.

4760. Child Maltreatment. 3. Lecture and seminar. Examines the phenomenon of child abuse and neglect. Includes an overview of attitudes towards and legal definitions of child maltreatment. Explores parental factors, contextual influences and developmental consequences of maltreatment. Relies heavily on current research in child abuse and neglect. Emphasizes policy implications. Cross listed with CRMJ 4760. *Prerequisite:* C or better in 6 hours in psychology.

4820. Psychology of Human Sexuality. 3. A clinical-personality orientation to psychological factors in the development and expression of human sexuality. Focuses on the individual: interactions of physiological factors with developmental influences and personality patterns that produce feelings, thoughts and behaviors associated with human sexuality. *Prerequisite:* A grade of C or better in PSYC 1000 and 2300 or FCSC 2121 or EDST 2450.

4830. Senior Thesis. 3. [WC♦(none)] Senior research project under faculty guidance and supervision. Faculty sponsorship must be obtained prior to registration. *Prerequisites:* senior standing, majors only, 24 hours in psychology, and consent of instructor.

4850. Field Work in Psychology. 1-3 (Max. 6). Provides opportunities to experience applied aspects of psychology in external settings through volunteering, teaching, and related activities. Type and location of experience and requirements for earning credit and for grading are determined with a sponsoring faculty person in the psychology department. An acceptable paper based on work completed may also be required. No credit is available for field work prior to registration for this course. Satisfactory/Unsatisfactory only. *Prerequisite:* consent of instructor required in advance.

4855. Undergraduate Research in Psychology. 1-3 (Max. 6). Provides new opportunities to assist in aspects of conducting basic and applied psychological research with a sponsoring faculty person in the psychology department. Specific research activities and requirements for earning credit and for grading are determined with a sponsoring psychology faculty person. An acceptable paper based on work completed may also be required. No credit is available for research conducted prior to registration for this course. Satisfactory/Unsatisfactory only. *Prerequisite:* consent of instructor required in advance.

4860. Seminar. 1-6 (Max. 6). Course consists of extended and in-depth discussions of particular topics in psychology. Topics vary semester to semester. Class format may include lecture, group discussion, and group activities. Reading assignments will draw heavily from scientific literature and may include journal articles, textbooks, or book chapter. *Prerequisite:* 9 hours in psychology.

4960. Service-Learning in Psychology. 3. Experience applied aspects of psychology in real world settings through volunteering. Recent research and other materials preparing students for their service will be discussed in class. After the volunteering experience, the students will prepare an academic paper integrating their practical experience with re-

search and theory learned in class. *Prerequisites:* PSYC 1000 and consent of instructor required in advance.

5060. Statistical Methods In Psychology. 3. General statistical analyses and their application to psychology. Analysis of variance, regression and correlation methods are studied from a data analytic perspective, emphasizing the conceptual understanding of where and when these techniques should be used and the interpretation of their results. Available computer programs will be utilized. Credit cannot be earned in more than one of the following courses: STAT 2020, 3050, 5050, 5060, 5070, 5080. *Prerequisite:* 1 course in statistics (all introductory courses except 2000).

5095. Statistical Computation In Psychology. 1-3 (Max. 12). Supervised problem-solving practice in statistical analysis is provided with regard to topics corresponding to those covered in a concurrent statistical analysis course. Statistical analysis topics vary. *Prerequisites:* graduate standing and instructor consent.

5120. Neuropsychology of Human Behavior. 3. Brain mechanisms involved in the expression and control of human behavior will be studied. Findings from classical neuropsychological studies and more recent clinical research investigations will be used in deriving explanations for the structural and physiological basis of normal and abnormal psychological processes. *Prerequisite:* 9 hours in psychology.

5140. Personality Science. 3. Examines contemporary scientific research and theory in personality. Surveys the biological, cognitive, affective, social, and interpersonal determinants of personality function with individual differences. A theoretical framework highlights the dynamic transactions between individuals and the sociocultural environment over the life course. *Prerequisite:* graduate standing in clinical or experimental psychology.

5180. Advanced Developmental Psychology. 3. Provides a graduate-level overview of development psychology, including current theories, issues, and research in both cognitive development and social development. *Prerequisite:* graduate standing.

5210. Advanced Physiological Psychology. 3. Examines the physiological bases of behavior beginning with a treatment of basic neuroanatomy, neurophysiology, and pharmacology. Discussion then proceeds to the physiological correlates of various behavioral states including sleep arousal, sensory processes, motor control, motivational systems, emotions, learning and memory. *Prerequisite:* 30 hours in psychology including PSYC 4080.

5230. Advanced Cognitive Psychology. 3. Provides the graduate student with an understanding of theoretical and experimental approaches to the study of human cognitive processing. There is an emphasis on critical evaluation of current research in the area. *Prerequisite:* 30 hours in psychology including PSYC 3120.

5240. Cognitive Psychology Seminar. 3 (Max. 12). Graduate level seminar in cognitive psychology, the topic of which will vary from semester to semester. Emphasis is on providing students with an in-depth analysis of some specific areas of cognitive psychology. *Prerequisite:* graduate standing.

5270. Behaviorism. 3. Acquaints the graduate student with behaviorist philosophy, the experimental analysis of behavior, and the application of behavioral technology to experimental, educational, and clinical problems. *Prerequisite:* 30 hours in psychology.

5300. Applied Multivariate Analysis. 3. The application of multivariate statistical methods in behavioral science research. Topics include multivariate regression, canonical correlation, discriminate analysis, factor analysis and multidimension scaling. A wide range of computer assistance is incorporated. Cross listed with STAT 5300. *Prerequisite:* STAT 5050.

5340. Introduction To Clinical Supervision. 1-4 (Max. 4). Provides an introduction to the supervision of psychotherapy for advanced doctoral students by having them observe a therapy case in the Psychology Clinic with assigned first year doctoral students and then give instruction as to therapeutic techniques used by the therapist and to client dynamics. *Prerequisite:* admission to the doctoral program in clinical psychology and consent of instructor.

5370. Graduate Seminar in Forensic Psychology. 3. To provide graduate level training in forensic psychology for students pursuing careers in psychology, counseling and criminal justice. *Prerequisite:* 16 hours in psychology or consent of instructor.

5375. Psychology/Law Proseminar. 1-10 (Max. 10). The Psychology Law Proseminar exposes students to various areas of psychological research. Topics will vary each semester and students will be expected to be actively engaged in the proseminar activities. Students will be exposed to theoretical and applied research that has relevance to legal settings. *Prerequisites:* graduate standing in Psychology and permission of instructor.

5380. Theories and Techniques of Psychotherapy. 3. A course for entering clinical doctoral students. Major current psychotherapies are reviewed in terms of theoretical

assumptions and related techniques. Required of first-year students in the program. *Prerequisite:* admission to doctoral program in clinical psychology.

5400. Clinical Assessment I. 3. First semester of a three semester practicum course in psychological assessment at the doctoral level. During the semesters, extensive examination is made regarding the standardization, relevant application, and significant limitations of assessment techniques. A thorough grounding is interpretation, and communication of the results of psychological evaluation both in writing and in consultation with referral sources. Normally taken during the first year of the doctoral program. *Prerequisite:* restricted to doctoral students in clinical psychology.

5410. Clinical Assessment II. 3. Second semester of a full-year practicum course in psychological assessment at the doctoral level. *Prerequisite:* PSYC 5400.

5425. Diagnostic Interviewing. 1. Students review research on diagnostic interviews, practice basic interviewing skills and learn to administer the Structured Clinical Interview for DSM-IV (SCID-I) using training tapes, class discussion and role-play exercises. As time permits, other interviews used to assess personality disorders and specific diagnostic categories will be reviewed. *Prerequisite:* admission to the doctoral program in clinical psychology.

5430. Clinical Neuropsychological Assessment. 3. Present the clinical psychologist in training with an introduction to the clinical application of neuropsychological principles and various tools. Includes the administration and interpretation of neuropsychological instruments and batteries, as well as the integration of more traditional assessment techniques with neuropsychological testing. *Prerequisite:* admission to the clinical doctoral psychology program, PSYC 5400, 5410, and 5120.

5450. Clinical Practicum. 1-4 (Max. 8). Beginning clinical practicum course providing doctoral students in clinical psychology with supervised experience in individual psychotherapy. Psychodynamic, client-centered, and behavioral techniques are employed. Cases and theoretical issues discussed in weekly seminar. Individual supervision of students by clinical faculty. *Prerequisite:* admission to doctoral program in clinical psychology and consent of instructor.

5460. Advanced Clinical Practicum. 1-12 (Max. 12). Advanced clinical practicum course for students beyond their second year in the doctoral program in clinical psychology. Provides additional supervised experience in individual, family, child, and group therapy,

as well as in psychological assessment. Experiences include case conceptualization, case management, and provision of direct services. *Prerequisite:* admission to doctoral program in clinical psychology, PSYC 5450, and consent of instructor.

5470. Empirically Supported Psychotherapies. 3. Students become familiar with the efficacy and effectiveness of important state-of-the-art treatments with a focus on treatments of mood and anxiety disorders. Course goals include gaining a critical understanding of the issues involved in identifying psychological treatments that work. *Prerequisite:* PSYC 5380; PSYC 5510.

5500. Psychopathology I. 3. Students will obtain research-based knowledge in developmental psychopathology via lectures, discussions, and student presentations. This course will cover disorders that usually begin in childhood and how these disorders manifest across the lifespan. The course will also cover disorders that begin later and how these disorders manifest in children and adolescents.

5510. Psychopathology II. 3. Students will obtain research-based knowledge of both descriptive and explanatory adult psychopathology. In addition to learning how adult mental disorders present, students will acquire a framework for understanding the multiple variables that interact over the lifespan to influence adult psychopathology.

5520. Introduction To Research. 3. Introduction to problems and issues in research methodology. Ongoing research directed by various faculty are used as paradigms for conceptualization of research problems. Students critically evaluate projects presented and begin planning for research leading to theses and dissertations. *Prerequisite:* graduate status in psychology.

5530. Professional Issues and Ethics. 3 (Max. 6). This course primarily emphasizes ethical considerations and principles guiding the practice of psychology. Additionally, career development issues such as internship, post-doctoral fellowships, licensure and grant writing are addressed. This course also promotes and explores the foundational importance of informing clinical practice with empirical evidence. *Prerequisite:* graduate standing in psychology.

5550. Clinical Seminar. 1-3 (Max. 18). Graduate level seminar in clinical psychology, the topic of which will vary from semester to semester. Emphasis is on providing students with an in-depth analysis of some specific area of clinical psychology. *Prerequisite:* admission to the doctoral program in clinical psychology.

5580. Advanced Social Cognition. 3. Provides an overview of the cognitive processes involved in social behaviour, including perception, judgment, memory, and evaluation. *Prerequisite:* graduate standing or permission of instructor.

5630. Clinical Supervised Practicum I. 2. The first semester of a one year practicum in clinical supervision for doctoral students in clinical psychology. Students supervise at least one 2nd or 3rd year clinical doctoral student, attend supervision team meetings, and may conduct group supervision and/or see clients as determined by team leader. *Prerequisites:* enrollment in doctoral program in clinical psychology.

5640. Practicum in Clinical Supervision II. 2. The second semester of a one year practicum in clinical supervision for doctoral students in clinical psychology. Students supervise at least one 2nd or 3rd year clinical doctoral student, attend supervision team meetings, and may conduct group supervision and/or see clients as determined by team leader. *Prerequisite:* enrollment in doctoral program in clinical psychology.

5650. Theories of Social Psychology. 3. Designed to give the student a thorough understanding of the theories and methodologies of contemporary Social Psychology. *Prerequisite:* 16 hours in psychology including PSYC 2380.

5720. Advanced Social Development. 3. Provides a graduate-level introduction to theory and empirical research on social development. Topics include emotional development, attachment, socialization, moral development, aggression, and social context. *Prerequisite:* graduate standing.

5740. Internship in Clinical Psychology 1. (Max. 3). Full-year, 40 hours per week assignment to a mental health or related agency having an established internship program. This placement must be approved by the Department of Psychology and include: (a) adequate supervision of the intern and (b) didactic and other educational experiences that supplement practicum work. Registration for fall, spring, and summer terms is required. *Prerequisite:* Completion of preliminary examination and dissertation proposal, department approval.

5760. Graduate Seminar. 1-10 (Max. 18). Topic varies from semester to semester. Emphasis is upon the preparation of reports on special topics in psychology and the presentation and discussion of these reports in the seminar situation. *Prerequisite:* 6 hours in psychology and consent of instructor.

5765. Teaching of Psychology. 1-3 (Max. 3). Course is designed to prepare future faculty in psychology for a career in teaching. Topics

covered include developing lectures and assignments, assessing students and providing feedback, using technology, and fostering skill development in students. Course emphasizes evidence-based teaching. *Prerequisite:* restricted to graduate students in psychology.

5775. Developmental Psychology Seminar. 1-3 (Max. 18). Graduate level seminar in developmental psychology, the topic of which will vary from semester to semester. Emphasis is on providing student with an in-depth analysis of some specific area of developmental psychology. *Prerequisite:* consent of instructor.

5780. Advanced Cognitive Development. 3. Provides a comprehensive account of current views of cognitive development. Emphasis is given to alternative theoretical explanations for findings from empirical research. *Prerequisite:* graduate standing.

5785. Social Psychology Seminar. 1-3 (Max. 18). Graduate level seminar in social psychology, the topic of which will vary from semester to semester. Emphasis is on providing students with an in-depth analysis of some specific area of social psychology. *Prerequisite:* permission of instructor.

5790. Clerkship in Clinical Psychology. 1-3 (Max. 9). Provides practical clinical and administrative experience in institutional and community settings. Experience includes psychological assessment, group and individual therapy activities, participation in clinical and administrative staff conferences, consultation to various departments and agencies within the institutional setting and in the community, training of professionals in psychological concepts and techniques, and participation in research. Experiences are located in various community, county, and state agencies primarily in the Rocky Mountain region. Successful completion of three clerkships is a required part of the doctoral program in clinical psychology. *Prerequisite:* enrollment in doctoral program in clinical psychology and assignment by department.

5800. Research in General Psychology. 1-8 (Max. 24). *Prerequisites:* consent of the instructor and graduate standing in the department.

5810. Research in Psychology and Law. 1-8 (Max. 24). *Prerequisites:* consent of the instructor and graduate standing in the department.

5820. Research in Social Psychology. 1-8 (Max. 24). *Prerequisites:* consent of instructor and graduate standing in the department.

5830. Research in Clinical Psychology. 1-8 (Max. 24). *Prerequisites:* consent of the instructor and graduate standing in the department.

5840. Research in Developmental Psychology. 1-8 (Max. 24). *Prerequisites:* consent of the instructor and graduate standing in the department.

5850. Research Cognitive Psychology. 1-8 (Max. 24). *Prerequisites:* consent of the instructor and graduate standing in the department.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5980. Dissertation Research. 1-12 (Max. 48). Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate level degree program.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

Theatre and Dance

2099 Buchanan Center for the Performing Arts, (307) 766-5100

Web site: uwoy.edu/thd/

Department Head: Margaret Wilson

Professors:

CECILIA ARAGÓN, B.S. McMurry University 1991; M.A. University of New Mexico 1996; Ph.D. Arizona State University 2003; Professor of Theatre and Dance 2017, 2005.

WILLIAM MISSOURI DOWNS, B.S. Northern Michigan University 1977; M.F.A. University of Illinois 1980; M.F.A. University of California-Los Angeles 1988; Professor of Theatre and Dance 2004, 1994.

MARSHA F. KNIGHT, B.F.A. University of Utah 1979; M.F.A. 1983; Professor of Theatre and Dance 1998, 1984.

MARGARET WILSON, B.A. University of Wyoming 1981; M.S. 1987; Ph.D. Texas Woman's University 2007; Professor of Theatre and Dance 2016, 2005.

LOU ANNE WRIGHT, B.A. California State University-Northridge 1990; M.F.A. National Theatre Conservatory 1993; Professor of Theatre and Dance 2007, 1994.

Assistant Professors:

PATRICK KONESKO, B.A. Saginaw Valley University 2008; M.A. Bowling Green State University 2009; Ph.D. 2013; Assistant Professor of Theatre and Dance 2015.

SCOTT TEDMON-JONES, B.F.A. University of Wyoming 2001; M.F.A. Carnegie Mellon University 2010; Assistant Professor of Theatre and Dance 2018.

Adjunct Professor:

Neil F. Humphrey

Degrees Offered

The Department of Theatre and Dance offers curricula leading to the B.A. degree and the Bachelor of Fine Arts and courses which fulfill a part of University Studies and various colleges' requirements, including the College of Arts and Sciences.

Curricula

Students may not take a course for S/U credit to satisfy course requirements in the major. This does not apply to courses offered for S/U only. Requirements for students majoring in the areas of the department are indicated below.

Theatre

The study of theatre provides students with a broad understanding of the art of theatre appropriate to theatre's position as a fine art in a liberal arts college. The study of theatre is considered to provide a basis for more specialized theatre study in a graduate or professional school. The liberal arts education in theatre together with extensive experience in the production program also provides the foundation for a professional career in theatre, motion pictures, or television drama for those individuals with special desires and abilities. Secondary teaching certification in theatre can be obtained through this program of study.

Dance

The dance concentration within the Department of Theatre and Dance is designed to provide students with a broad foundation in the humanities and specific emphasis in performance and production aspects of dance. Students pursuing this course of study will have opportunities to attain technical competency in ballet and/or modern dance, to perform in

yearly dance productions, to obtain practical experience in the fundamentals of teaching dance and to gain experience in technical theatre as an aid to dance production. The program seeks to provide a comprehensive view of dance as an artistically expressive medium, as well as a creative and recreational tool to human expression.

Students completing this program will qualify for more advanced private instruction as well as advanced academic instruction.

All dance students are matriculated into the BA degree. Students wishing to apply for the BFA in Dance Performance or BFA in Dance Science do so the second semester of their freshman year.

Students must receive a C or better in all courses designated THEA to satisfy department degree requirements. A student's transfer courses in Theatre and Dance must also reflect a C or better to be accepted for credit. A grade of C- does not meet the requirement.

Programs

B.A. with Theatre Track

These are the required courses for a B.A. with Theatre Track. Certain substitutions may have to be made and all scheduling of classes should be discussed with an adviser.

THEA 1040.....	0.5
THEA 1100.....	3
THEA 1200.....	3
THEA 2010.....	3
THEA 2020.....	3
THEA 2040.....	0.5
THEA 2150.....	3
THEA 2220.....	3
THEA 2800.....	3
THEA 3730.....	3
THEA 3740.....	3
THEA 3810.....	3
THEA 3820.....	3
THEA 4820.....	3
THEA 4930.....	3
THEA 4940.....	3
Foreign Language.....	8

B.A. with Dance Track

These are the required courses for a B.A. with Dance Track. Certain substitutions may have to be made and all scheduling of classes should be discussed with an adviser.

THEA 1021.....	1
THEA 1040.....	0.5
THEA 1200.....	3
THEA 1405.....	1

THEA 1450.....	1
THEA 2040.....	0.5
THEA 2050.....	1
THEA 2200.....	3
THEA 2410.....	1.5
THEA 2420.....	1.5
THEA 2430.....	1.5
THEA 2440.....	1.5
THEA 2480.....	1
THEA 3021.....	1
THEA 3100.....	3
THEA 3410.....	1.5
THEA 3420.....	1.5
THEA 3430.....	1.5
THEA 3440.....	1.5
THEA 3480.....	1
THEA 4010.....	4
THEA 4030.....	4
<i>Plus 4 credits in any combination of 4010 and 4030</i>	
THEA 4200.....	3
THEA 4250.....	2
THEA 4260.....	2
THEA 4880.....	1
LIFE 1000 or LIFE 1010 or ANTH 1100....	4
KIN 2040.....	3
KIN 2041.....	1
Foreign Language.....	8
First Aid/CPR.....	0

Bachelor of Fine Arts

This degree program in theatre and dance permits 60-70 credits in the major field. It is designed primarily for students who seek additional professional training in theatre and dance or who wish to enter M.F.A. graduate programs.

Students seeking the professional degree will be expected to meet degree requirements as specified by the College of Arts and Sciences. Students may substitute advanced theatre and dance courses for university electives.

For other requirements consult with the Department of Theatre and Dance.

Bachelor of Fine Arts

Theatre/English Concentration

This degree program permits a total of 60-70 credits in the major. It is designed primarily for those desiring to pursue professional education courses and certification to programs.

These are the required courses for a B.F.A. with Theatre/English Concentration. Certain substitutions may have to be made and all scheduling of classes should be discussed with an adviser.

THEA 1040.....	0.5
THEA 1100.....	3
THEA 1200.....	3
THEA 2010.....	3

THEA 2020.....	3
THEA 2040.....	0.5
THEA 2150.....	3
THEA 2220.....	3
THEA 2800.....	3
THEA 3730.....	3
THEA 3740.....	3
THEA 3810.....	3
THEA 3820.....	3
THEA 4820.....	3
THEA 4830.....	3
THEA 4930.....	3
THEA 4940.....	3
ENGL 2000.....	6
ENGL 4000.....	9
ENGL 4110 or 4120.....	3
Foreign Language.....	8

Bachelor of Fine Arts

Concentration

This degree program permits a total of 60-70 credits in the major. It is designed primarily for those desiring to pursue additional pre-professional training in theatre and dance or for those preparing to enter M.F.A. graduate programs.

These are the required courses for a B.F.A. with Acting Concentration:

Certain substitutions may have to be made and all scheduling of classes should be discussed with an adviser.

THEA 1040.....	0.5
THEA 1100.....	3
THEA 1200.....	3
THEA 1700.....	2
THEA 2010.....	3
THEA 2020.....	3
THEA 2040.....	0.5
THEA 2160.....	2
THEA 2170.....	3
THEA 2220.....	3
THEA 2720.....	2
THEA 2790.....	3
THEA 3730.....	3
THEA 3740.....	3
THEA 3750.....	3
THEA 3950.....	3
THEA 4710.....	3
THEA 4720.....	3
THEA 4730.....	2
THEA 4820.....	3
THEA 4930.....	3
THEA 4940.....	3
Foreign Language.....	8
<i>and three hours from the following:</i>	
THEA 1410.....	1
THEA 1430.....	1
THEA 1450.....	1
THEA 1480.....	1

Bachelor of Fine Arts**Dance Performance Concentration**

This program permits a total of 71-74 credits in the major. It is designed primarily for students in dance who wish to pursue additional preprofessional training in theatre and dance or for those preparing to enter M.F.A. graduate programs.

The BFA in Dance Performance is a professionally oriented degree for students interested in a career of performing or choreographing. In addition to specific course work, BFA students complete a senior project which provides summation and synthesis to their training. Admission to the BFA is by application only. Students will be required to submit an application no sooner than spring of their freshman year and interview during the end of the spring semester. All students admitted to the BFA program are considered on provisional status in their first year in the program, and are evaluated on a yearly basis on maintaining a 3.000 GPA in dance required courses, demonstrating appropriate progress in artistic and technical growth and active participation in the Department of Theatre and Dance productions and research. Students wishing to apply for the BFA in Dance Performance do so the second semester of their freshman year.

These are the required courses for a B.F.A. with Dance Performance Concentration. Certain substitutions may have to be made and all scheduling of classes should be discussed with an adviser.

THEA 1021	1
THEA 1040	0.5
THEA 1100	3
THEA 1200	3
THEA 1405	1
THEA 1450	1
THEA 2040	0.5
THEA 2050	1
THEA 2160 or 2800 or 3820	2-3
THEA 2200	3
THEA 2410	1.5
THEA 2420	1.5
THEA 2430	1.5
THEA 2440	1.5
THEA 2450	1
THEA 2480	1
THEA 3021	1
THEA 3100	3
THEA 3410	1.5
THEA 3420	1.5

THEA 3430	1.5
THEA 3440	1.5
THEA 3480	1
THEA 3490	1
THEA 4001	2
THEA 4010	4
THEA 4030	4
<i>Plus 8 credits total in any combination of 4010 and 4030</i>	
THEA 4200	3
THEA 4250	2
THEA 4260	2
THEA 4700	1
THEA 4880	1
THEA 4880	1
THEA 4950 or THEA 4960	2
THEA 4975	1-12
LIFE 1000 or LIFE 1010 or ANTH 1100	4
KIN 2040	3
KIN 2041	1
Foreign Language	8
First Aid/CPR	0

Bachelor of Fine Arts**Dance Science Concentration**

This program permits a total of 78 credits in the major. It is designed primarily for students in dance who wish to pursue additional preprofessional training in theatre and dance or for those preparing to enter M.F.A. graduate programs.

The BFA in Dance Science is a professionally oriented degree for students interested in a career of dance research and wish to pursue some aspect of the science field in relation to dance. In addition to specific course work, BFA students complete a senior project which provides summation and synthesis to their training. Admission to the BFA is by application only. Students will be required to submit an application no sooner than spring of their freshman year and interview during the end of the spring semester. All students admitted to the BFA program are considered on provisional status in their first year in the program, and are evaluated on a yearly basis on maintaining a 3.000 GPA in dance required courses, demonstrating appropriate progress in artistic and technical growth and active participation in the Department of Theatre and Dance productions and research. Students wishing to apply for the BFA in Dance Science do so the second semester of their freshman year.

These are the required courses for a B.F.A. with Dance Science Concentration. Certain substitutions may have to be made and all scheduling of classes should be discussed with an adviser.

THEA 1021	1
THEA 1040	0.5
THEA 1200	3
THEA 1405	1
THEA 1450	1
THEA 2040	0.5
THEA 2050	1
THEA 2200	3
THEA 2410	1.5
THEA 2420	1.5
THEA 2430	1.5
THEA 2440	1.5
THEA 2480	1
THEA 3021	1
THEA 3100	3
THEA 3410	1.5
THEA 3420	1.5
THEA 3430	1.5
THEA 3440	1.5
THEA 3480	1
THEA 4010	4
THEA 4030	4
<i>Plus 2 credits total in any combination of 4010 and 4030</i>	
THEA 4200	3
THEA 4250	2
THEA 4260	2
THEA 4880	1
THEA 4990	3
LIFE 1010	4
KIN 2040	3
KIN 2041	1
KIN 3050	2
PSYC 1000	4
FCSC 1141	3
KIN 4020 or KIN 3034	3
KIN 3037 or KIN 3038	3
Foreign Language	8
First Aid & Personal Safety Certification	0
Additional upper-division required course work (minimum 6 hours from the following courses):	
KIN 3021	4
KIN 3040	3
KIN 3042	3
FCSC 3145	3
FCSC 4147	3
PSYC 3120	3
PSYC 3250	3
PSYC 4070	3

**Bachelor of Fine Arts
Design Tech Management Concentration**

Students in the B.F.A. degree program who are completing the Design Tech Management concentration will have the option of petitioning for permission to serve on the production staff of a departmental production as a designer or technician. Ordinarily, the petition would be submitted to the departmental faculty during the student's junior year and the project would be completed during the student's senior year. This project would be done under THEA 4880 or 4990 for 1 to 3 hours of credit.

These are the required courses for a B.F.A. with Design Tech Management Concentration.
Certain substitutions may have to be made and all scheduling of classes should be discussed with an adviser.

THEA 1040.....	0.5
THEA 1050.....	3
THEA 1100.....	3
THEA 1200.....	3
THEA 2010.....	3
THEA 2020.....	3
THEA 2040.....	0.5
THEA 2150.....	3
THEA 2220.....	3
THEA 2250.....	3
THEA 2790.....	3
THEA 2800.....	3
THEA 2990.....	3
THEA 2995.....	3
THEA 3730.....	3
THEA 3805.....	3
THEA 3810.....	3
THEA 3820.....	3
THEA 3850.....	2
THEA 4810.....	3
THEA 4820.....	3
THEA 4850.....	3
THEA 4930.....	3
THEA 4940.....	3

Recommended Electives:

THEA 2145.....	3
THEA 2160.....	2
THEA 2810.....	3
THEA 2900.....	3
ART 2010.....	3
ART 2020.....	3

**Bachelor of Fine Arts
Theatre and Dance
(Musical Theatre Performance
Concentration)**

The following are the required courses for a Bachelor of Fine Arts in Performance (Musical Theatre):

THEA 1040.....	0.5
THEA 1100.....	3
THEA 1200.....	3
THEA 1300.....	4
THEA 1360.....	3
THEA 1700.....	2
THEA 2010.....	3
THEA 2020.....	3
THEA 2040.....	0.5
THEA 2160.....	2
THEA 2170.....	3
THEA 2220.....	3
THEA 2340.....	6
THEA 2720 or 4730.....	2
THEA 2790.....	3
THEA 3730.....	3
THEA 3740.....	3
THEA 3950.....	3
THEA 4330.....	3
THEA 4710.....	3
THEA 4720.....	3
THEA 4820.....	3
THEA 4930.....	3
Foreign Language.....	8

Plus 3 hours from the following:

THEA 1410.....	1
THEA 1430.....	1
THEA 1450.....	1
THEA 1480.....	1

Plus two additional dance courses in an area of choice.

Minor Programs

The following courses are required for a minor in Theatre:

THEA 1040.....	0.5
THEA 1100.....	3
THEA 1200.....	3
THEA 2010.....	3
THEA 2020.....	3
THEA 2040.....	0.5
THEA 2220.....	3
THEA 2800 or 3810* or 3820.....	3

Plus 3 hours of electives in Theatre and Dance (must be 4000 level or above)

*THEA 2150 is a prerequisite for THEA 3810

The following courses are required for a minor in Dance:

THEA 1021.....	1
THEA 1040.....	0.5

Four (4) consecutive classes in Ballet technique.* Choose from:5-6
THEA 1410, THEA 1420, THEA 2410, THEA 2430, THEA 3410, THEA 3420, THEA 4010

Four (4) consecutive classes in Modern technique.* Choose from:5-6
THEA 1430, THEA 1440, THEA 2430, THEA 2440, THEA 3430, THEA 3440, THEA 4030

Two (2) consecutive classes in Jazz or a mix of Jazz and Tap classes.* Choose from:.....2
THEA 1450, THEA 1480, THEA 2450, THEA 2480, THEA 3480, THEA 3490

THEA 22003
THEA 4250**.....2

Elective at 3000-4000 level2-3
Suggested: THEA 4010, THEA 4030, THEA 4001, or THEA 4200 (COM3)

Minor Total 17.5-22.5

Scholarships

A number of scholarships are available to interested majors in theatre or within the dance option. The University Theatre also maintains a summer company. Applications should be sent to the Department of Theatre and Dance, Dept. 3951, 1000 E. University Ave., Laramie, WY 82071.

**Departmental Activities/
Organizations**

The department sponsors one of the largest all-student activities on campus. Nearly 250 students take part in its productions each season. All students are eligible to participate in its productions through auditions.

Productions are mounted in the Center for the Fine Arts which includes a flexible proscenium theatre and an experimental-studio theatre complete with scene and costume support facilities.

Auditions, open to all university students, are publicly announced for each production. Qualified students may receive credit in performance and production areas (THEA 2050).

The Wyoming Summer Theatre presents a season of plays of varying types during the summer session. Theatre majors and minors are urged to spend at least one summer working with this group.

Graduate Study

At present, no program for graduate degrees in theatre and dance is offered; however, courses may be counted at the graduate level.

Theatre and Dance (THEA)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦♦Q]).

1000. Introduction to Theatre, TV & Film.

3. [CA♦♦H] A broad examination of theatre, television and film through the ages including history, production, dramatic literature, creativity, art, entertainment and censorship.

1021. Academic and Professional Issues in Dance. 1. [I,L♦♦(none)]

Introduces freshman to the discipline of dance and academic study at the University of Wyoming. Key intellectual and literacy concepts will be introduced, including, but not limited to: critical thinking and analysis, knowledge of the discipline, career options, diversity of the discipline, university and region.

1040. Production Crew I. 0.5.

Participation in one Departmental production during semester enrolled. Contribute to the preparation and/or actual production of one stage play in the area(s) of lighting, costume construction, set construction, scenic painting, stage properties, or arts management. Required for all Theatre & Dance freshmen. *Prerequisite:* consent of instructor.

1050. Beginning Drawing and Painting. 3.

An introductory drawing and painting technique course for students to achieve a working knowledge of a variety of mediums that cross the disciplines of scenic, costume, and lighting design. Form, perspective, texture and basic color theories will be explored.

1100. Beginning Acting. 3. [CA♦♦H]

Explores inner resources of beginning actor and brings these resources to bear upon the art of creating a believable stage image.

1101. First-Year Seminar. 3. [(none)♦♦FYS]

Introduces and explores visual aesthetic principles as they relate to various aspects of stage design. Studio projects in scene, lighting, and costume design supplement lectures. *Prerequisite:* for other design courses.

1300. Musical Theatre Workshop. 1 (Max. 8).

Workshop production of a Musical or Musical Theatre scenes.

1360. Fundamentals of Music for Theatre Majors. 3.

Basics of music theory to include music notation, rhythm, pitch, scales, key signatures, triads, and basic ear training and keyboard skills, specific to the needs of Musical Theatre. Assumes little or no music theory background.

1405. Introduction to Pilates Training. 1 (Max. 2).

An introduction to Pilates based training, including mat work and exercises on the Reformer. *Prerequisite:* consent of instructor.

1410. Ballet I/I. 1. [CA♦♦H] Introduces principles and practices of classical ballet technique.

1420. Ballet I/II. 1. [CA♦♦H] Continues studies in classical ballet technique. Instructor permission required. *Prerequisite:* THEA 1410.

1430. Modern Dance I/I. 1. [CA♦♦H] Introduces principles and techniques of modern dance.

1440. Modern Dance I/II. 1. [CA♦♦H] Continues studies in modern dance technique. Instructor permission required. *Prerequisite:* THEA 1430.

1450. Beginning Tap Dance. 1. Explores basic tap techniques and related principles of tap dance composition.

1470. Men's Technique. 1 (Max. 2). Introduces and develops the principles and techniques of movement and dance specific to men.

1480. Beginning Jazz. 1. [(none)♦♦H] Introduces jazz dance.

1700. Voice for the Actor. 2. Introduction to voice work. Emphasizes breath freedom, flexibility and support for the actor. Methodologies studied include: Fitzmaurice Voicework, Linklater and Lessac systems.

2005. Creative Drama in the Classroom.

3. Focuses on K-12 Theatre teaching methods. Students discover teaching methods for integrating improvisation, storytelling, movement/dance, and puppetry into the school curriculum. Students design and implement theatre lessons using these creative drama techniques. To engage real life practice teaching, students are given opportunities to teach creative drama lessons to the class.

2010. Theatrical Backgrounds Drama I.

3. First semester of a two-course series. Introduces dramatic literature through the ages.

2020. Theatrical Backgrounds Drama II.

3. Second semester of a one-year course. Continues THEA 2010. *Prerequisite:* THEA 2010.

2030 [3500]. Beginning Playwriting. 3.

Introduces writers to the creative process of playwriting (writing for the stage) or screenwriting (writing for the movies). Strongly emphasizes character and story development, as well as practical side of the industry. Students write a play or screenplay. *Prerequisites:* WA and THEA 1000, 1100.

2040. Production Crew II. 0.5. Continues the "hands-on" production crew experience provided by Production Crew I. Contribute to a Theatre Department production in the area(s) of lighting, costume construction, set construction, scenic painting, stage properties, stage management, or arts management. Required for all Theatre & Dance majors. *Prerequisite:* THEA 1040.

2050. Theatre Practice. 1-2 (Max. 4). Encompasses individually supervised practical training in performance and production. Offered for S/U only. *Prerequisite:* consent of instructor.

2060. Introduction to Performance Studies. 3. [(none)♦♦COM2] Introduces students to the theories and practices of Performance Studies as an interdisciplinary field. Students will apply these concepts as a way of exploring issues of culture and identity, particularly in an international context.

2145. Costume Construction. 3. Teaches the basic skills and terminology that are used in costume construction. Teaches hand and machine sewing focusing on techniques used to stitch historical and modern costumes as well as basic knowledge of fabric.

2150. Drafting for Design. 3. Introduces Design and Technical students to the basics of hand drafting and numerous drafting techniques and conventions. After completing this course, students will be well prepared for scenic and lighting design courses.

2160. Stage Makeup. 2. Introduction to theatrical makeup with the stage performer in mind. Focus on principles, materials, and techniques; concentrating on problems of designing and executing specific makeup designs and applications for a wide range of ages, types, and styles.

2170. Speech for the Actor. 3. Studies speech techniques, including the International Phonetic Alphabet and Standard American Speech for the Stage. Builds upon the Fitzmaurice-Voicework technique as well as other voice methodologies. *Prerequisites:* THEA 1100 and 1700.

2180. Costume Crafts. 3. Focuses on the area of costume crafts which may include but not limited to dyeing, millinery, masks, fabric painting and distressing, working with a variety of materials. *Prerequisite:* THEA 2145.

2200. Backgrounds of Dance. 3. [CA,G♦♦H] Surveys ethnic and theatrical dance forms from primal society to 20th century. Examines the place of the arts as a reflection of the culture.

2220. Stagecraft. 3. Introduces students to basic stage production practices and techniques, including safe rigging practices, set construction, scenic painting, stage properties, and stage lighting. Students are encouraged to participate in "hands-on" demonstrations during classes.

2250. Computer Aided Design I. 3. Building on skills and techniques learned in THEA 2150 Drafting for Design, the course introduces and provides students with training on commonly used software, that may include CAD, 3D-modeling, and photo editing soft-

ware. Skills acquired will be built upon in later courses. *Prerequisite:* THEA 2150 or by permission of instructor.

2340. Musical Theatre Voice Lesson. 1 (Max. 8). Solo instruction in singing techniques and performance styles associated with Musical Theatre. Includes demonstration, brief lecture, discussion, and active participation through singing, analyzing, movement, and performance.

2400. Vertical Dance I. 1. An introduction to vertical dance including safety issues, beginning rigging and performance. Satisfactory/Unsatisfactory only. *Prerequisite:* consent of instructors.

2410. Ballet II/I. 1.5 (Max. 3). A first year, first semester ballet technique class for dance majors and minors. This course focuses on expanding the dancer's understanding and knowledge of technique, vocabulary and principles of classical ballet. *Prerequisite:* Limited to dance majors and minors; admission by permission only.

2415. Pointe I. 1 (Max. 4). A beginning level point class based on the principles of classical ballet. *Prerequisite:* Completion of or concurrent enrollment in THEA 2410, or permission of the instructor. Limited to dance majors and minors.

2420. Ballet II/II. 1.5 (Max. 3). Second semester of the first year ballet technique class for dance majors and minors. This course focuses on expanding the dancers understanding and knowledge of technique, vocabulary and principles of classical ballet. Class meets three times per week. *Prerequisite:* Successful completion of THEA 2410 or equivalent required. Limited to dance majors and minors; admission by permission only.

2425. Pointe II. 1 (Max. 4). An intermediate level pointe class based on the principles of classical ballet. *Prerequisite:* THEA 2415 or permission of the instructor. Limited to dance majors and minors.

2430. Modern Dance II/I. 1 (Max. 3). A first year, first semester, modern dance technique class for dance majors and minors. Knowledge of basic vocabulary and principles will be augmented with an understanding of historical techniques and their application to contemporary dance. Class meets three times per week. *Prerequisite:* Limited to dance majors and minors; admission by permission only.

2435. Repertory. 1 (Max. 4). A beginning level repertory class based on the principles of modern dance. *Prerequisite:* Status in the dance department, or permission of the instructor is required before enrolling.

2440. Modern Dance II/II. 1 (Max. 3). A first year, second semester, modern dance technique class for dance majors and minors. Mastering vocabulary and principles will be augmented with a deeper understanding of historical techniques and their application to contemporary dance. Class meets three times per week. *Prerequisite:* THEA 2430. Limited to dance majors and minors; admission by permission only.

2445. Repertory II. 1 (Max. 4). A beginning level partnering class based on the principles of ballet or modern dance. *Prerequisite:* Status in the dance department, or permission of the instructor is required before enrollment.

2450. Tap II. 1. Continues studies in techniques and principles of tap dance. *Prerequisite:* THEA 1450.

2480. Jazz II. 1. [(none)◀▶H] Continues studies in techniques and principles of jazz dance. Instructor permission required. *Prerequisite:* THEA 1480.

2720. Intro to Stage Combat. 2. The basic techniques used in staging both unarmed stage combat and rapier and dagger fight scenes. Students will experience the process of learning, rehearsing, and performing fight scenes. Includes analysis, discussion, training exercises, and choreographed performance. General curriculum follows that set forth by the Society of American Fight Directors. *Prerequisite:* THEA 1100.

2790. Stage Management. 3. Study of the essential elements of supervising theatrical productions. Stresses the art of organizing auditions, casts, crews, rehearsals, and performances while developing a unique professional relationship with directors, designers and actors. Students will work on a live production. *Prerequisite:* THEA 1100, 1200, 2220.

2800 [3800]. Stage Lighting I. 3. Examines the elemental aspects of stage lighting including equipment, facilities, color, and fundamental electricity. Requires studio work on departmental productions. Intended for majors in the program. *Prerequisite:* THEA 2150 and THEA 2220.

2810. Scenic Painting for the Theatre. 3. Introduces the art of scenic painting by the hands-on use and instruction of a variety of scenic paints, application on select construction materials, the use of unique tools and techniques commonly used to paint scenery for the stage. Safe use and proper handling of such material are addressed. *Prerequisite:* THEA 2220.

2900. Sound Design for Theatre and Dance. 3. Examines the basic aspects of sound design for the theatre, dance, entertainment and film worlds. Topics covered include re-

coding, sampling, live mixing, playback, and non-linear editing through several software packages. *Prerequisite:* THEA 2220.

2990. Period Style for Theatre I. 3. First semester of a one-year survey. Studies antiquity to the Renaissance with an overview of the architecture, décor, clothing, arts and culture as related in their use and understanding of Western drama. The social, economic, and political histories of each period will be discussed as well. THEA 2990 and 2995 should be taken in sequence.

2995. Period Style for Theatre II. 3. Second semester of a one-year survey. Studies Renaissance to Contemporary with an overview of the architecture, decor, clothing, arts and culture as related in their use and understanding of Western drama. The social, economic, and political histories of each period will be discussed as well. THEA 2990 and 2995 should be taken in sequence. *Prerequisite:* THEA 2990 or permission of instructor.

3000. Special Topics in Theatre. 3. (Max. 9) Provides undergraduates with the opportunity for in-depth study in areas of Theatre not offered in regular courses or independent study. Course includes discussions on specific topics as well as studio work. *Prerequisites:* 6 credit hours in Theater/Dance.

3021. Foundations of Dance Pedagogy. 1. Introduces students to basic theories and practices of dance pedagogy. Lecture and discussion will be balanced with peer teaching and coaching, observation of lessons and integration within a dance classroom situation with some teaching responsibilities and development of a portfolio with lessons and resources for teaching. *Prerequisites:* sophomore standing in the department of Theatre and Dance; successful completion of THEA 3420 or THEA 3440.

3100. Kinesiology for Dance. 3. Encompasses seminar in current kinesiology research for dancers. Includes practicum based projects, lectures and supplementary materials. *Prerequisite:* ZOO 2040.

3160. Advanced Stage Makeup. 2. Extension of Stage Makeup, focusing primarily on the development of a life mask and ultimately prosthetics using a variety of mediums. *Prerequisite:* THEA 2160.

3400. Vertical Dance II. 1 (Max. 2). A continuing course in vertical dance emphasizing the math and physics of the rigging; safety and design, choreography and research in the field. *Prerequisites:* completion of THEA 2400 and consent of instructors.

3410. Classical Ballet III/I. 1.5 (Max. 3). A second year, first semester ballet technique class for dance majors and minors. Class meets

three times per week. Emphasis is placed on improving technical skills and learning more advanced steps. Includes research into one discipline of ballet. *Prerequisites:* successful completion of THEA 2440 and admission by permission only. Limited to dance majors and minors.

3420. Classical Ballet III/II. 1.5 (Max. 3). Second semester of the second year ballet technique class. Emphasizes broadening the dancer's movement vocabulary while refining acquired technical skills. Dancers begin work in study of Baroque dance terms. Class meets three times per week. *Prerequisites:* successful completion of THEA 3410 or equivalent required. Limited to dance majors and minors; admission by permission only.

3430. Modern Dance III/I. 1.5 (Max. 3). A second year, first semester, intermediate level modern dance technique class for dance majors and minors. Continued training in classical modern dance and continued historical survey of modern dance will be augmented by rhythmic analysis and compositional forms. Class meets three times per week. *Prerequisite:* successful completion of THEA 2440 or its equivalent. Limited to dance majors and minors; admission by permission only.

3440. Modern Dance III/II. 1.5 (Max. 3). A second year, second semester, modern dance technique class with continuing studies of sequential modern dance technique at the intermediate level, introduction of Laban effort/shape theory, compositional forms, improvisation and additional rhythmic analysis. Class meets three times per week. *Prerequisite:* THEA 3430 or its equivalent. Limited to dance majors and minors; admission by permission only.

3480. Jazz III/I. 1 (Max. 2). An intermediate jazz technique class. Students will learn varying styles of jazz dance, ranging from historical to contemporary, and will perform these for evaluation and incorporate them into class compositions. *Prerequisite:* THEA 2480.

3490. Jazz III/II. 1 (Max. 2). An advanced class in jazz technique and performance. Students will learn varying styles of jazz dance, ranging from historical to contemporary, and will perform these for evaluation as well as incorporate them into class compositions. *Prerequisite:* THEA 3480.

3501. Screen Writing and Television Writing. 3. This class introduces students to the craft of writing for movies and television. Strong emphasis is placed on character and story development as well as how the Hollywood entertainment industry works. *Prerequisite:* COM1 or consent of instructor.

3600. Teaching Theatre in Elementary or Secondary School. 3. Focuses on aspects of age appropriate teaching methods, strategies, and curriculum planning for either elementary or secondary education. Additional emphasis include planning a production season, arts management and budgeting, using national and state content and performance standards, assessing student growth, and developing community advocacy plans. *Prerequisite:* THEA 1100.

3650. Theatre for Young Audiences: Plays and Production. 3. Highlights aspects of performance and directing for child audiences. Students will explore the work of outstanding contemporary playwrights who are writing for young audiences, and develop techniques in writing, acting, and directing for and with young people. *Prerequisite:* THEA 1100.

3730. Intermediate Acting. 3. Develops the actor's voice and body for characterization and character interaction through performance of scenes. Study of character and scene analysis. *Prerequisites:* THEA 1100.

3740. Acting Styles. 3. Focuses on textual analysis of plays from different periods and styles of dramatic literature. Emphasizes vocal and physical interpretation of character as represented in non-realistic styles of drama. *Prerequisites:* THEA 1100 and 3730.

3750. Acting for the Camera. 3. Addresses performance skills required in acting for the camera. Covers various techniques, styles, and skills necessary to be successful in the professional world of film and television as an actor. Students perform scenes for 3-camera and single camera set-ups, and become familiar with rudimentary technical skills as crewmembers for shoots. Lecture and test material cover career opportunities, union affiliations, and current trends in the film and television industry. *Prerequisites:* THEA 1100 and 3730.

3805. Stage Lighting II. 3. Analyze proposed productions in terms of period, style, theatre limitations and instrumental inventories. Determine appropriate design solutions in written descriptive analyses that result in 2-D drawings of the design. Produce all supporting paperwork including drafting a plan view, section view, instrument schedules, magic sheets and proposed cue lists. *Prerequisites:* THEA 2800.

3810. Scene Design I. 3. An in-depth study of idea development from script analysis through design conception using different types of theaters and source material. The design process will cover research, drawing, drafting, model making, and rendering. *Prerequisites:* THEA 2150 and THEA 2220 or by permission of instructor.

3820 [4840]. Stage Costuming I. 3. A study of basic drawing and rendering skills, and a selective study of historical silhouettes. Objectives include the ability to trust instinct, application of the basic elements of design, applying historical reference and research to a specific character, developing a concept and finally the application of these principles to a final project. *Prerequisite:* THEA 1100.

3840. Historical Costumes from the Skin Out. 3. Learning how to replicate period gowns and undergarments prior to the 1920s by draping and flat-patterning techniques. Includes the research and construction of one complete set of period undergarments and gown either as an individual or in a team to be determined by the complexity of the garment and the skill level of the students. *Prerequisite:* FCSC 3174 (4170) or FCSC 3175.

3850. Design and Technology Seminar. 2. Introduces designer/technician to process of preparing successful interview material, including a professionally developed portfolio. Exposes designer/technician to business aspects of the theatre world, including resumes, letters of inquiry and application, contracts, unions and professional organizations, internships, apprenticeships, URTAs and professional design/technical training programs. Culminates in junior End-of-the-Year Evaluations. *Prerequisite:* junior standing in the BFA Program with Design/Technical emphasis.

3890. Lighting CADD. 3. Designed for the advanced lighting student, provides further exploration of the computer technology that has become so critical for modern lighting design. Introduces students to software programs such as VectorWorks, Lightwright, and Photoshop, as well as networking and advanced programming for modern light boards. *Prerequisites:* THEA 2250 and 2800.

3910 [591]. 20th Century Theatre Diversity. 3. Studies plays and production techniques, within the context of historical and sociological events, as developed in the 20th Century that has led to the cultural diversity seen in modern theatre. *Prerequisite:* junior standing.

3950. Dialects for the Actor. 3. Introduces the actor to five major dialects for the stage. Examines sensibility, vowel and consonant changes, pitch placement and charting. *Prerequisites:* THEA 1100, 1700, and 2170.

4001. Historical Dance. 2 (Max. 2). Historical dance forms in the "Noble Style" dating from the 15th through 18th Centuries. Class work covers the relationship of musical forms to the specific step vocabulary and dances of each period, deportment, period costume as it relates to movement, social environment, pe-

riod style with an emphasis on reconstruction of 17th and 18th Century dances from Feuillet notation. *Prerequisite:* THEA 3440.

4010. Advanced Ballet. 1-3 (Max. 8). A continuing course in the principles and techniques of classical ballet. Emphasis is placed on continuing to broaden the dancer's movement vocabulary while refining acquired technical skills. *Prerequisite:* THEA 3420. Limited to dance majors and minors; admission by permission only.

4030. Advanced Modern Dance. 1-3 (Max. 8). This class will develop a professional dancer capable of working within diverse modern dance styles and techniques through the interweaving of classical and contemporary movement modalities along with an experiential anatomy approach. *Prerequisite:* THEA 3440. Limited to dance majors and minors; admission by permission only.

4060. English/Theatre Studies in _____. 3. Identical to ENGL 4060.

4200. 20th Century Dance. 3. [CA,WC◀COM3] Intensely studies dance in 20th Century, emphasizing contemporary movement in modern, ballet, jazz and musical theatre dance. Examines social, political and aesthetic trends influencing dance theory and performance. *Prerequisite:* THEA 2200.

4230. Greek Tragedy. 3. Reading and discussion of major plays by Aeschylus, Sophocles, and Euripides, together with examination of the performance and social context of Greek drama, its use of traditional myths, and selected issues in contemporary scholarship on the tragedies. Cross listed with CLAS/ENGL 4230. *Prerequisite:* WB or COM2. **4250. Beginning Dance Composition. 2.** Presents and criticizes movement studies based on various approaches to composition. Explores experimentation in choreography. *Prerequisite:* THEA 2420, 2440.

4260. Intermediate Dance Composition. 2-3 (Max. 3). *Prerequisites:* THEA 4250 and consent of instructor.

4330. History of American Musical Theatre. 3. [WC◀COM3] History of the American Musical from its inception to today. Emphasis on developments and literature. *Prerequisites:* THEA 2010, 2020, 6 hours in theatre at the 3000-level.

4500. Advanced Playwriting. 3. An intensive continuation of THEA 3500. Focuses on the creation, analysis and rewriting of play script(s), culminating in a public reading or performance of the script(s). *Prerequisite:* THEA 2030.

4600. Teaching Theatre Artists: Service Learning in the Community. 3. Focus on Service Learning in the Community. Students will have the opportunity to observe various

settings in the community of development of theatre program. Some areas of observation and practicum include drama/theatre-in-education, community-issue-focused-theatre, and theatre with special populations, crisis prevention, drama therapy, Preventive Medical Agencies, etc. *Prerequisite:* THEA 1100.

4700. Auditioning and Careers in Dance. 1. Designed for dance majors as a culminating course in preparation for final semester auditions and applications for companies and graduate schools. Through this course, students will set career goals, create an audition portfolio, and gain exposure to the many challenges and opportunities in dance. *Prerequisites:* senior standing, THEA 1021, and one semester of THEA 4010 or 4030.

4710. Advanced Scene Study. 3 (Max. 6). Involves intensive work at an advanced level dealing with individual actor's problems through the medium of scene study. *Prerequisite:* THEA 3740.

4720. Auditioning and Professional Issues. 3. Introduces actors to process of finding, preparing and executing successful audition material, including monologues, songs and dance combinations. Exposes actors to business aspects of the theatre world, including resumes, photos, contracts, unions, internships, apprenticeships, Equity Membership Candidacy programs, URTA's and professional actor training graduate programs. Culminates preparation for final semester auditions for the company/school of choice. *Prerequisites:* THEA 1100, 3730 and 3740.

4730. Movement for Actors. 2. An exploration of the underlying physical skills of actors as well as the art of physical acting and non-verbal storytelling. We will be using a mix of Viewpoints, LeCoq, Suzuki, and other practitioners' contributions, including Mask, Mime, Clowning, Devised Theatre and more. *Prerequisite:* THEA 1100 and 1700.

4770. Summer Theatre. 1-3 (Max. 6). Offers credit for participation in the Wyoming Summer Theatre program in all phases of production. Offered for S/U only. *Prerequisites:* 12 hours in theatre and consent of instructor. (Offered summer session)

4800. Stage Lighting-Production. 3. Explores design and execution of lighting for theatrical production. Includes practical laboratory work with Theatre & Dance productions. *Prerequisite:* THEA 2800, 2900, and 3805.

4810. Scene Design II. 3. Building on previous coursework, this course will focus on further development of the individual creative and design processes, honing research and presentation skills, and refinement of artistry and craftsmanship. Strong emphasis will be

on the presentation of ideas and the advancement of the portfolio. *Prerequisite:* THEA 2250 and 3810.

4820. Directing I. 3. Tools course. Focuses on basic pictorial and blocking skills of the director. Includes in-class exercises that cover structural and character analysis of play scripts, blocking annotation and prompt scripts, developing ground plans, creating compositions with emphasis, focus and balance, and employing movement as a dynamic tool. Requires two outside directing projects with verbal evaluations of all project work. *Prerequisites:* THEA 2010, 2020, 3730, and 3810 or instructor permission.

4830. Directing II. 3. Focuses on creative process of developing directorial concepts, establishing the world and style of the play, working with the actor, and functioning as a designer. Includes exercises that analyze different directorial approaches, as well as the audition and casting process. Culminates one-act mounted production performed before invited audience. *Prerequisites:* THEA 4820 and written permission of instructor.

4845. Costume Fit and Alteration. 3. Focuses on fitting modern clothing and historical costumes to individuals. Students learn how to identify fit issues in a fitting, make the proper corrections and fit the garment again. Students use a combination of previously constructed garments and also pattern garments to fit. *Prerequisite:* FCSC 3174 (4170) or FCSC 3175.

4850. Stage Costuming II. 3. Explores costume design, emphasizing various rendering techniques. Emphasis is placed on the portfolio. *Prerequisite:* THEA 3820.

4880. Advanced Theatre Practice. 1-2 (Max. 4). Encompasses individual problems in theatre or interpretation. Includes research, writing and practical work. *Prerequisites:* 12 hours in theatre and consent of instructor.

4930. Theatre History I. 3. [WC◀COM3] First semester of a one-year series. Surveys theatrical and dramatic practices from origins of Western European theatre to the theatre of the avant-garde. Specifically focuses on the climate of ideas and theoreticians, theatrical practitioners and audiences. Offered fall semester. *Prerequisites:* THEA 2010, 2020, 6 hours in theatre at 3000-level.

4940. Theatre History II. 3. Second semester of a one-year series. Continues THEA 4930. *Prerequisite:* THEA 4930.

4950. Senior Thesis. 3. Encompasses senior research project under faculty member guidance and supervision. *Prerequisite:* senior standing.

4960. Senior Project. 1-3 (Max. 3). Exercise in the practical application of production, centered on a UW production, either main stage or studio. It may deal with design in scenery, costumes, properties, sound, makeup, playwriting, technical direction, directing, dance pedagogy, or choreography. The project is intended to be a “real” exercise in theatrical production.

4975. Theatre/Dance Internship. 1-12 (Max. 12). The intent of this course is designed to provide professional experiences to students outside of the academic curriculum of Theatre and Dance Department. It is designed to advance the students potential career opportunities and help advance their knowledge in the field. Restricted to sophomores, juniors, and seniors. *Prerequisite:* Must have completed 6 hours in the department of Theatre and Dance.

4990. Research in Theatre. 1-3 (Max. 6). *Prerequisite:* 6 hours in area of research and consent of instructor.

Zoology and Physiology

114 Aven Nelson

(307) 766-4207

Web site: www.uwyo.edu/Zoology

Department Head: Robert S. Seville

Professors:

MERAV BEN-DAVID, B.S. Tel Aviv University 1984; M.S. 1988; Ph.D. University of Alaska 1996; Professor of Zoology and Physiology 2010, 2000.

CRAIG W. BENKMAN, B.A. University of California at Berkeley 1978; M.S. Northern Arizona State University 1981; Ph.D. State University of New York at Albany 1985; Robert Berry Professor of Ecology, Professor of Zoology and Physiology 2004.

CARLOS MARTINEZ del RIO, B.Sc. Universidad Nacional de Mexico 1984; Ph.D. University of Florida 1990; Professor of Zoology and Physiology 2004, 2000.

DAVID B. MCDONALD, A.B. Harvard College 1973; Ph.D. University of Arizona 1987; Professor of Zoology and Physiology 2010, 1996.

FRANK J. RAHEL, B.A. Kenyon College 1974; M.S. University of Wisconsin 1977; Ph.D. 1982; Professor of Zoology and Physiology 1998, 1985.

ROBERT S. SEVILLE, B.S. San Diego State University 1981; M.S. University of Wyoming 1987; Ph.D. 1992; Professor of Zoology and Physiology 2011, 1995.

QIAN-QUAN SUN, B.Sc. Shandong Normal University 1990; M.S. 1993; Ph.D. St. Andrews University 1998; Professor of Zoology and Physiology 2016, 2004.

Associate Professors:

MATTHEW D. CARLING, B.S. University of Michigan 1997; M.S. University of Idaho 2002; Ph.D. Louisiana State University 2008; Associate Professor of Zoology and Physiology 2017, 2011.

ANNA D. CHALFOUN, B.A. Smith College 1995; M.S. University of Missouri-Columbia 2000; Ph.D. University of Montana-Missoula 2006; Associate Professor of Zoology and Physiology 2016, 2011.

BRIAN D. CHERRINGTON, B.A. Washington University 1996; M.S. Colorado State University 2001; Ph.D. 2005; Associate Professor of Zoology and Physiology 2017, 2011.

MICHAEL E. DILLON, B.S. University of Texas, Austin 1998; Ph.D. University of Washington 2005; Associate Professor of Zoology and Physiology 2015, 2009.

JACOB R. GOHEEN, B.S. Kansas State University 1998; M.S. Purdue University 2002; Ph.D. University of New Mexico 2006; Associate Professor of Zoology and Physiology 2015, 2010.

MATTHEW J. KAUFFMAN, B.A. University of Oregon 1992; Ph.D. University of California, Santa Cruz 2003; Associate Professor of Zoology and Physiology 2014, 2006.

AMY C. KRIST, B.A. State University of New York at Potsdam 1991; Ph.D. Indiana University 1998; Associate Professor of Zoology and Physiology 2017, 2004.

AMY M. NAVRATIL, B.S. Colorado State University 1999; Ph.D. 2005; Associate Professor of Zoology and Physiology 2019, 2011.

JONATHAN F. PRATHER, B.S. University of Virginia 1995; Ph.D. Emory University 2001; Associate Professor of Zoology and Physiology 2015, 2009.

KARA PRATT, B.A.S. University of Delaware; Ph.D. Brandeis University 2004; Associate Professor of Zoology and Physiology 2017, 2011.

ANNIKA W. WALTERS, B.A. Princeton University 2002; M.S. Yale University 2006; Ph.D. 2009; Associate Professor of Zoology and Physiology 2019, 2011.

Assistant Professors:

RILEY FEHR BERNARD, B.Sc. Linfield College 2007; M.Sc. University of Hawaii Hilo 2011; Ph.D. University of Tennessee 2015; Assistant Professor of Zoology and Physiology, 2020.

SARAH M. COLLINS, B.A. Lewis & Clark College 2007; Ph.D. Cornell University 2015; Assistant Professor of Zoology and Physiology 2018.

FETZER, WILLIAM WARREN, B.S. University of Wisconsin-Madison 2005; M.S. Cornell University 2009; Ph.D. 2013.

YUN LI, B.S. University of Science and Technology of China 1996; M.S. 1998; Ph.D. University of Texas Health Center at San Antonio 2003; Assistant Professor of Zoology and Physiology 2018.

JEROD A. MERKLE, B.S. University of Arizona 2006; M.S. University of Montana 2011; Ph.D. Université Laval 2014; Assistant Professor of Zoology and Physiology 2018.

COREY E. TARWATER, B.S. University of California, Davis 1999; M.S. University of Illinois, Urbana-Champaign 2006; Ph.D. 2010; Assistant Professor of Zoology and Physiology 2015.

W.D. (TREY) TODD, B.S. Baylor University 2005; M.A. University of Iowa 2009; Ph.D. 2012; Assistant Professor of Zoology and Physiology 2019.

Senior Academic Professional Research Scientist:

ZHAOJIE ZHANG, B.S. Shandong University 1985; M.S. 1988; Ph.D. University of Oklahoma 1999; Director, Microscopy Core Facility, University of Wyoming 2001; Senior Research Scientist in Zoology and Physiology 2012.

Assistant Academic Professional Research Scientist:

JONATHAN PATRICK KELLEY, A.B. Harvard 2001; Ph.D. University of California, Davis 2012; Assistant Research Scientist in Zoology and Physiology 2018.

Professors Emeritus:

Harold L. Bergman, Steven W. Buskirk, Francis W. Flynn, Zoltan M. Fuzessery, Robert P. George, William A. Gern, Robert O. Hall, Henry J. Harlow, Wayne A. Hubert, Robert M. Kitchin, J.A. Lillegraven, Frederick G. Lindzey, James R. Lovvorn, Graham Mitchell, James D. Rose, Joan Smith-Sonneborn

Academic Professional Lecturer

Emeritus:

Jane Beiswenger

Wyoming Cooperative Fish and Wildlife Research Unit

Unit Leader: Matthew W. Kauffman

Assistant Unit Leader for Fisheries: Annika W. Walters

Assistant Unit Leader for Wildlife: Anna D. Chalfoun

The Department of Zoology and Physiology offers a variety of courses in the biological sciences that encompass many aspects of animal form, function, and biology.

Whether you are interested in the intricacies of cell biology or the complexities of ecosystem functioning and whether you want to become a wildlife biologist or a physician, we offer a major that will suit your needs. Students can choose from four undergraduate degrees: biology, physiology, wildlife and fisheries biology and management, or zoology. Course requirements for each degree are detailed on our website: www.uwyo.edu/zoology.

Undergraduate Degrees

Physiology Major

Physiology is the study of how animals work: how they breathe, feed, interact with their environment, and carry out many other activities and functions. Physiology is the knowledge that the health sciences are built on and so is especially important for students who may be thinking of becoming medical practitioners, veterinarians or health care professionals.

All courses in the major must be completed with a grade of “C” or better.

Foundation Courses:

MATH	1400
MATH	1405
(MATH 1450 may substituted for MATH 1400 and 1405)	
MATH	2200
STAT	2050 or 2070
CHEM	1020
CHEM	1030

Two additional CHEM courses: CHEM 2230 or 2300 or 2420 or 2440 or 3020 or 3550 or 4050 or 4230 or 4400 or MOLB 3610*

PHYS	1110
PHYS	1120
LIFE	1010
LIFE	2022 or MICR/MOLB 2021
LIFE	3050

*MOLB 3610 may be used as a CHEM elective, but cannot also count as a Core Elective

Physiology Core Required Courses

ZOO	3115
ZOO	4125
ZOO 4100 and 4101 (or approved USP C3 substitute)	

Physiology Core Electives

A minimum of 10 of the 18 Physiology Core Elective credits must be exclusive to the PHSO major. Choose a total of 18 credits from: ANSC 4120 or 4260 or ANTH 4210 or 4230 or KIN 3021 or 3038 or 3042 or 4042 or LIFE 3600 or MOLB 3610 or 4100 or 4400 or 4670 or NEUR 4295 or 5100 or 5295 or 5685 or 5887
PATB 4130 or 4140 or 4400 or 4710
PHCY 3450 or PSYC 3250 or 4040 or 4080

or 4250 or SOC 3550 or 4160 or ZOO 3010 or 4110 or 4280 or 4340 or 4670 or 4735 or 5100 or 5685 or SPPA 3265 or CHEM 3550**

**cannot count towards PHSO electives if used as a CHEM requirement in the Foundational Courses

At the end of this program students will have a thorough knowledge of physiology, will be well prepared to enter health sciences or graduate education, and will have a range of skills attractive to employers.

Wildlife and Fisheries Biology and Management Major

Wildlife and Fisheries Biology and Management is a professional degree designed to prepare students for state, federal, and other positions in resource management and conservation biology. The degree provides students with knowledge of the natural world, understanding of processes governing dynamics of wildlife and fish populations, as well as an appreciation of human-mediated effects on wildlife and fish populations. A student graduating with this degree will be familiar with the theory of resource management as well as with methods used to determine population status, habitat quality, and conservation. In Wyoming the abundance of wild animals and pristine habitats provide a unique natural laboratory for studying the responses of wildlife and fish populations to changing climates and habitats.

Foundation Courses

MATH	1400
MATH	1405
(MATH 1450 may substitute for MATH 1400 and 1405)	
MATH	2200 (may substitute MATH 2350)
STAT	2050 or 2070 or LIFE 2100
CHEM	1020
CHEM	1030

Physical Science (GEOL 1100, PHYS 1110, or SOIL 2010)
COSM 1200 or approved Data Sciences course

LIFE	1010
LIFE	2022

Core Required Courses

LIFE	3050
LIFE	3400
LIFE	3410
ZOO	2450
ZOO	4190
ZOO	4400
ZOO	4970
ZOO 4100 and 4101 (or approved USP C3 substitute)	

Complete Terrestrial OR Aquatic Option TERRESTRIAL OPTION

A minimum of 10 of the TERRESTRIAL OPTION requirements listed below (BOT 4700 and ZOO 4300 and Restricted Electives) must be exclusive to the WFBM major.

BOT	4700
ZOO	4300

Plus 14 Credits Restricted Electives from:
ZOO 3600 or 4235 or 4310 or 4330 or 4350 or 4370 or 4380 or 4415 or 4420 or 4430 or 4440 or 4540 or BOT 0000:5999 or ENR 0000:5999 or SOC 3950 or REWM 0000:5999 or CHEM 2230 or AGECE 3750 or LIFE 2023

AQUATIC OPTION

A minimum of 10 of the AQUATIC OPTION requirements listed below (ZOO 4330 and ZOO 4440 and ZOO 4430 and Restricted Electives) must be exclusive to the WFBM major.

ZOO	4330
ZOO	4440
ZOO	4430

Plus 15 Credits Restricted Electives from:
ZOO 3600 or 4235 or 4300 or 4310 or 4350 or 4370 or 4380 or 4415 or 4420 or 4540 or CHEM 2230 or BOT 0000:5999 or REWM 0000:5999 or ENR 0000:5999 or SOC 3950 or AGECE 3750 or LIFE 2023

A student graduating with a degree in WFBM will have comprehensive knowledge of wildlife and fisheries biology and management, will have earned a degree that is compatible with the requirements for professional certification with the American Fisheries Society or the Wildlife Society, and will have a range of knowledge and skills that are valuable to potential employers.

Zoology Major

Zoology is the study of animals: their structure, physiology, development and evolution. One of the enduring fascinations of zoology is that we can learn so much about ourselves and our environment by studying what our fellow creatures do.

Foundation Courses

MATH	1400
MATH	1405
(MATH 1450 may substitute for MATH 1400 and 1405)	
MATH	2200
STAT	2050 or 2070 or LIFE 2100
CHEM	1020
CHEM	1030
CHEM 2230 or 2300 or 2420 or 2440 or 3020 or 3550 or 4050 or 4230 or 4400	
PHYS	1110

PHYS	1120
LIFE	1010
LIFE	2022
LIFE	3050
LIFE	3400
LIFE	3500

ZOO 4100 and 4101 (or approved USP C3 substitute)

Advanced Zoology course*

One of: ZOO 4330 or 4350 or 4370 or 4380 or 4540.

* if more than one of the required courses is completed, additional courses can count towards the Zoology Approved Core Electives below.

Zoology Approved Core Electives

A minimum of 10 of 18 Zoology Approved Core Electives must be exclusive to the ZOOL major.

Choose a total of 18 credits from:

ZOO 3115 or 3600 or 4190 or 4235 or 4300 or 4310 or 4330 or 4340 or 4350 or 4370 or 4380 or 4540 or 4400 or 4415 or 4420 or 4430 or 4440 or 4735 or ANSC 3010 or 3100 or 3150 or MOLB 3000 or BOT 4235 or 4550 or 4664 or 4790 or GEOG 3150 or 3480 or ENTO 4300 or 4682 or 4678 or 4684 or PATB 4170 or 4310 or 4360 or 4710

At the end of this program students will have a comprehensive knowledge of zoology, will be well prepared for graduate education, and will be equipped to enter any of the many employment opportunities that are available.

Learning Outcomes for Undergraduates

The learning outcomes that direct the teaching of the department's degrees and which we expect our graduates to have acquired are:

- Competence in basic sciences;
- Competence in the content of the specific courses that constitute the principal knowledge of the degree;
- Ability to comprehend, analyze, and interpret biological data where appropriate; and
- Ability to synthesize information from the biological literature, and communicate it effectively in writing or orally.

Undergraduate Minor

Minors in human and animal physiology, wildlife fisheries biology management, neuroscience, and zoology are offered. Contact the department for further information.

Human and Animal Physiology Minor

Requirements for the minor in human and animal physiology (AHPY) include a minimum of 18 credit hours. Courses counted towards one minor may not be counted towards another. A grade of C or better is required in all courses.

Required Courses

ZOO 3115

AND at least one of these three*:

ZOO 4125, ZOO 4190, PHCY 3450

AND at least three courses from the

Electives list.

* if more than one of the three required courses is completed, additional courses can count towards Physiology Core elective courses requirement below.

Elective Courses

Physiology Core Electives. At least three courses from:

ANSC 4120 or 4260 or ANTH 4210 or 4230 or KIN 3021 or 3038 or 3042 or 4042 or LIFE 3600 or MOLB 3610 or 4100 or 4400 or 4670 or NEUR 4295 or 5100 or 5295 or 5685 or 5887

PATB 4130 or 4140 or 4400 or 4710

PSYC 3250 or 4040 or 4080 or 4250 or SOC 3550 or 4160 or ZOO 3010 or 4110 or 4280 or 4340 or 4670 or 4735 or 5100 or 5685 or SPPA 3265 or CHEM 3550

Wildlife Fisheries Biology Management Minor

Requirements for the minor in wildlife fisheries biology management (WFBM) include a total of 18-22 credit hours. Courses counted towards one minor may not be counted towards another. A grade of C or better is required in all courses.

Required Courses

9 or 11 credit hours required from the following: LIFE 3400, ZOO 2450, and ONE (1) course from ZOO 4300 or ZOO 4310

Elective Courses

Select three (3) of the following courses, one of which must have a laboratory component: LIFE 3050, ZOO 3600, ZOO 4190, ZOO 4330, ZOO 4350, ZOO 4370, ZOO 4380, ZOO 4400, ZOO 4415, ZOO 4420, ZOO 4440, ZOO 4540

Zoology Minor

Requirements for the minor in zoology (ZOOL) include 17-20 credit hours. Courses counted towards one minor may not be counted towards another. A grade of C or better is required in all courses.

Required Course

LIFE 3050

Elective Courses

Select four (4) of the following courses, one of which must have a laboratory component: LIFE 3400, LIFE 3500, ZOO 3115, ZOO 3600, ZOO 4190, ZOO 4235, ZOO 4330, ZOO 4340, ZOO 4350, ZOO 4370, ZOO 4380, ZOO 4540, BOT 4235

Graduate Study

The Department of Zoology and Physiology offers programs leading to the master of science and the doctor of philosophy in zoology and physiology. We also participate in graduate programs through the Neuroscience Program and the Program in Ecology.

Program Specific Admission Requirements

Admission is open to all students who meet the minimum requirements set forth in the admissions section of this *Catalog*.

Research and teaching assistantships are available for graduate students working toward the M.S. or Ph.D. degrees. Applicants can apply for this financial assistance at the time they apply for admission to graduate standing. Applications must be completed by February 15 in order to be considered for the following academic year.

Information on how to apply to the graduate program in the Department of Zoology and Physiology is detailed on our web site. Begin by identifying a faculty member in our department whose research interests are similar to yours. We will only consider an application if a faculty member has indicated a willingness to serve as the student's adviser. After finding a potential adviser, e-mail a completed departmental application form, a copy of your curriculum vitae, copies of college transcripts, and recommendation letters to him or her. Our graduate admissions committee will review all applications and make decisions on admission based on the availability of funding and a commitment from a faculty member to serve as the adviser. Students recommended for admission will then be asked to fill out an application to the University of Wyoming and pay a non-refundable application fee.

Consult the website, www.uwyo.edu/zoology, to find out about faculty research.

Program Specific Degree Requirements

Master's Program Plan A (thesis)

Includes 26 hours of coursework and 4 hours of thesis research.

Applicants should have at least 20 semester hours of undergraduate work in zoology, physiology, or other areas of the biosciences and have completed introductory courses in mathematics, chemistry, and in at least one other natural or physical science. Early in the second semester the student must file a program of study with the university and have a graduate committee appointed. Plan A candidates shall orally defend the thesis before the graduate committee.

All M.S. candidates will be required to complete credit in two graduate seminars. A student may enroll in more than one of these required seminars during one semester or academic year.

After two semesters in the department, a Plan A master's candidate may request permission from the department's graduate advisory board to proceed directly to the Ph.D. degree; however, such a bypass is granted only by the department head after considering recommendations from the graduate advisory board.

Zoology and physiology may be used as a field by a candidate working for the interdisciplinary master of science in natural science in the College of Arts and Sciences and the College of Education.

Plan B (non-thesis)

Includes 30 hours of coursework.

The program for the Plan B is established by the student and a faculty adviser and must be approved by the department head during the student's second semester or summer session.

The graduate committee will require the candidate to take a written examination. An oral examination may also be required. The final examination is comprehensive, covering all areas of zoology, but emphasizing one major area.

Doctoral Program

This is a 72 hour program.

A Ph.D. applicant must have 20 hours of undergraduate work in zoology, physiology, or other areas of biology and also have completed substantial undergraduate work in other sciences. Under exceptional circumstances, a student with an undergraduate major in a

scientific discipline other than biology may be admitted. After the Ph.D. student has completed two semesters of graduate work, s/he must be approved for continued work toward the doctorate by the graduate advisory board. This board can reconsider a candidate thereafter if it so desires.

A graduate committee shall be appointed for the individual student no later than the third semester. After consultation with the student, this committee will prescribe special requirements (courses, minors, research tools, etc.) that must be fulfilled. At this time, the graduate committee shall consult with the candidate on the proposed research and shall identify the subject matter areas to be included in the preliminary examination. The preliminary examination will consist of a written research proposal, its oral defense, and a written and oral preliminary examination. When training outside zoology and physiology is specified by the committee, certification of satisfactory completion of the requirement will be made by the appropriate department.

In addition to the general university requirements for the Ph.D. degree, the department requires the following:

The coursework program should include work in a discipline outside the department, generally in the sense of a minor, to be identified in consultation with the graduate committee.

The preliminary examination consisting of written and oral portions should be taken no later than midterm of the fourth semester in residence. The graduate committee will certify satisfactory performance for the preliminary examination.

The dissertation must be received by each member of the graduate committee three weeks before the final dissertation seminar. As oral defense of the dissertation, the candidate will deliver a formal 50 minute seminar on original research from the dissertation. The seminar will be followed by an examination by the graduate committee.

Some time during their degree program, all Ph.D. candidates will be required to complete credit in three graduate seminars. A student may enroll in more than one of these required seminars during one semester or academic year.

All candidates for the Ph.D. degree shall be required to teach for one semester during their program.

The dissertation may be written in a format suitable for publication in a journal and the usual extensive literature review, description of study sites, technical details, raw data, supporting figures, charts, and photographs should be included in a well-organized appendix. (See also format requirements by the university.)

Learning Outcomes for M.S. Students

1. Comprehend and synthesize advanced knowledge in a specific area of biology.
2. Collect and analyze data to address a research question.
3. Summarize research findings and communicate them effectively in writing and orally.

Learning Outcomes for Doctoral Students

1. Comprehend and synthesize advanced knowledge in a specific area of biology.
2. Develop a research project which constitutes a substantial and original contribution to the field of study.
3. Summarize research findings and communicate them effectively in writing and orally.

Zoology (ZOO)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1101. First-Year Seminar. 3. [(none)◀▶FYS] 2450. Fish and Wildlife Management in the Anthropocene. 4. [(none)◀▶COM2] Course examines fundamental principles in management of natural resources, especially fish and wildlife populations. Students explore historical to contemporary context of management, population biology, management tools and their application, career opportunities, with specific emphasis on human dimensions, law, and policy. Students will develop oral and written communication skills. Crosslisted with ENR 2450. *Prerequisite:* LIFE 1010, LIFE 2022, and COM1.

3010. Vertebrate Anatomy, Embryology, and Histology. 4. Provides a comprehensive overview of vertebrate anatomy. The structural organization, embryological derivation, and histological organization of the major organ systems will be emphasized. The evolution and functional organization of anatomical structure will also be emphasized. Includes laboratory sessions. Fulfills degree requirement

in physiology subsection for zoology major. *Prerequisites:* LIFE 2022 or equivalent, and a semester of chemistry.

3115. Human Systems Physiology. 4. Covers the fundamental function(s) of the human body systems, from cells and tissues through organs and systems, focusing also on biological communication and homeostasis. Students learn how to interpret physiological data. Includes laboratory and tutorial sessions. Fulfills degree requirement in physiology subsection for zoology major. *Prerequisites:* At least ((C in CHEM 1020 or CHEM 1050) or B in CHEM 1000) and C in LIFE 1010.

3600. Principles of Animal Behavior. 3. Intensively introduces scientific study of animal behavior. Utilizes evolutionary, ecological and physiological approach. *Prerequisite:* introductory course in zoology, biology or psychology. (Normally offered spring semester)

4100. Scientific Communication. 2. [WC, L, COM3] This course is designed to provide intensive instruction in written, oral, and digital communication for zoology and physiology, biology, and botany majors. The course teaches students to communicate and execute research using practices common in the biological sciences. Cross listed with BOT 4100. *Prerequisites:* COM1, COM2, and concurrent or prior upper division BOT, ZOO, or LIFE course. Preference given to seniors.

4101. Scientific Communication Lab. 1. This course is designed to provide intensive instruction in written, oral, and digital communication for zoology and physiology, biology, and botany majors. The course teaches students to communicate and execute research using practices common in the biological sciences. Cross listed with BOT 4101. *Prerequisites:* COM1, COM2, and concurrent or prior upper division BOT, ZOO, or LIFE course. Preference given to seniors.

4110. HIV/AIDS: The Disease and the Dilemma. 3. Explores the basic biology of the HIV virus, and its effects upon the human body, the magnitude of the global HIV/AIDS pandemic, treatment and prevention of AIDS, and the social, political, economic, and legal issues of HIV/AIDS. *Prerequisite:* LIFE 1003 or LIFE 1010.

4125 [3120]. Integrative Physiology. 5. Examines how functional organ systems are coordinated and integrated by the CNS and endocrine systems to establish and maintain health. Includes lecture, flipped component and tutorial session. Students must register for lecture and tutorial. *Prerequisites:* grade of C or higher in ZOO 3115; and/or a Pharmacy 1 standing.

4190 [4230]. Comparative Environmental Physiology. 4. Studies and interprets principles of physiology which adapt animals to various environmental constraints. Introduces discipline which has risen between traditional fields of physiology and ecology and provides understanding of animal distribution and survival. Fulfills degree requirements in physiology subsection for the zoology major. Dual listed with ZOO 5190. *Prerequisites:* LIFE 2022 or LIFE 2023 and CHEM 1030 or CHEM 1060. (Offered spring semester)

4235. Marine Biology. 3. This course explore major topics of physical oceanography, marine biodiversity and ecology, and human impacts on the ocean. Emphasis is placed on reading, evaluating, and synthesizing primary literature. Dual listed with ZOO 5235. Cross listed with BOT 4235. *Prerequisite:* LIFE 3400 with a grade of C or better.

4280. Introduction to Neuroscience. 3. Examines the basic electrical properties of neurons and from there identifies determinants of brain development, how neuronal "circuits" are formed and how these neuronal systems enable the processing of sensory information, coordinated movement, adaptation to the environment, and other complex functions (e.g., sleep, sex). Dual listed with ZOO 5280. *Prerequisite:* ZOO 3115 or equivalent.

4295. Neurodevelopment. 3. Through lecture and discussion of research articles, students learn mechanisms of nervous system development, from the birth and differentiation of neurons to the formation of synapses and circuits. Focus is on classical experiments done in vertebrates (*Xenopus* tadpole, chick, zebrafish, and mouse) and invertebrates (nematode and *Drosophila*). Dual listed with ZOO 5295; cross listed with NEUR 4295. *Prerequisite:* ZOO 4280.

4300 [4720]. Wildlife Ecology and Management. 5. Integrates concepts of vertebrate ecology with the art of wildlife management, stressing approaches to deal with the inherent uncertainty of managing populations. Strategies to increase or decrease populations of target species, tools used to determine population status (e.g., viability analysis, monitoring, habitat assessment), and ecosystem management approaches. Laboratory included. Dual listed with ZOO 5300. *Prerequisites:* LIFE 3400, STAT 2050 or 2070, and ZOO 2450. (Offered fall semester)

4310 [4730]. Fisheries Management. 3. Acquaints students with theory and techniques of inland fisheries management. Includes methods of evaluating growth and production, rates of mortality and recruitment and use of yield models in fisheries biology. Includes

laboratory and field exercises. Dual listed with ZOO 5310. *Prerequisite:* ZOO 4330. (Normally offered fall semester)

4330 [4750]. Ichthyology. 3. Anatomy, physiology and classification of fishes, emphasizing classification and identification of Wyoming fishes. Includes laboratory. Dual listed with ZOO 5330. *Prerequisite:* LIFE 2022. (Normally offered spring semester)

4340. Developmental Biology and Embryology. 4. Introduces study of vertebrate embryology and cellular differentiation. Includes gametogenesis, fertilization, blastulation and organogenesis, growth and differentiation, teratology, metamorphosis, regeneration and asexual reproduction. Emphasizes mechanisms that create form and regulate cellular differentiation. Dual listed with ZOO 5340. *Prerequisite:* one year of life sciences, one year of chemistry. (Normally offered spring semester)

4350 [4780]. Ornithology. 3. Acquaints students with classification, identification, morphology, distribution, natural history and ecology of the birds of North America. Includes laboratory. Dual listed with ZOO 5350. *Prerequisite:* LIFE 2022. (Offered spring semester)

4370 [4790]. Mammalogy. 3. Studies mammals of the world, emphasizing natural history, distribution, taxonomy, ecology and morphology of mammalian species. Includes laboratory. Dual listed with ZOO 5370. *Prerequisite:* LIFE 2022. (Offered fall semester)

4380. Herpetology. 3. Introduces the ecology, behavior, morphology, evolution, systematics and conservation of reptiles and amphibians. Dual listed with ZOO 5380. *Prerequisite:* LIFE 2022.

4400. Population Ecology. 3. Explores quantitative ecology of animal populations, emphasizing theoretical and empirical work. Provides modern coverage of principles of population ecology for wildlife majors and others who expect to deal with ecological problems in their careers. Dual listed with ZOO 5400. *Prerequisites:* LIFE 1010, LIFE 3400 and STAT 2050 or consent of instructor. (Offered spring semester)

4415. Behavioral Ecology. 3. Applies empirical and theoretical approaches to ecological and evolutionary underpinnings for behaviors ranging from foraging and predation to social grouping and mating systems. Emphasizes comparative analyses (what phylogenetic patterns exist across diverse species?) as well as genetic/fitness benefits (how do individuals benefit from apparently puzzling behaviors?). Dual listed with ZOO 5415. *Prerequisites:* ZOO 3600 or LIFE 3400 or permission of the instructor. (Offered fall semester)

4420. Conservation Biology. 3. Addresses the broadest environmental issues facing society (habitat loss, invasion, overexploitation) and the mechanisms driving them, with particular attention to the Intermountain West. Through computer exercises, students also learn how to evaluate conservation efforts and make management recommendations. Cross listed with BOT/ENR 4420. *Prerequisites:* LIFE 3400 and one of the following: ENR 3500, STAT 2050, or STAT 2070.

4430. Limnology Laboratory. 2. Utilizes basic field techniques in limnology. Emphasizes analysis and interpretation of data obtained from field and laboratory exercises. *Prerequisite:* concurrent enrollment in ZOO 4440. (Offered fall semester)

4440. Limnology. 3. Studies ecology of inland waters; biological, chemical and physical features of lakes and streams. *Prerequisites:* LIFE 1010, LIFE 3400 and CHEM 1030 or consent of instructor. (Offered fall semester)

4540. Invertebrate Zoology. 4. Studies major invertebrate phyla of the animal kingdom. Studies each phylum with respect to morphological and taxonomic characteristics; functional and evolutionary relationships; environmental adaptations; life cycles of representative types. Includes laboratory. Dual listed with ZOO 5540. *Prerequisite:* LIFE 2022. (Offered fall semester)

4650. Tropical Field Ecology Ecuador. 4. Course comprises 10 days in Ecuador in January (before spring semester), followed by one lecture per week during spring semester. Focus will be ecology, biodiversity and conservation of tropical forests and behavioral ecology of birds and mammals. Field site is at 1100m on west slope of the Andes. Dual listed with ZOO 5650. *Prerequisite:* LIFE 2022.

4735. [5730] Advanced Topics in Physiology. 1-4 (Max. 12). Designed to cover advanced topics in Physiology for students specializing in Physiology or related fields. Examples of topics include endocrinology, cardiovascular, renal, neurological, respiratory, and metabolic physiology. Integrative topics (e.g. circadian rhythms, thermal stress) may also be included. Dual listed with ZOO 5735. *Prerequisites:* ZOO 3115 or equivalent as approved by the instructor.

4740. Fish Culture and Nutrition. 3. Studies methods in artificial propagation of fishes. Includes spawning, hatchery methods, water quality requirements and nutritional requirements. Includes laboratory. *Prerequisite:* LIFE 2022, CHEM 1020. (Offered fall semester)

4900. Problems. 1-8 (Max. 8). For advanced students. Studies some particular problem or phase of zoology, or presents reviews and

discussions of current advancement in zoological investigations. Content is arranged to suit individual needs of students. Satisfactory/Unsatisfactory only. *Prerequisites:* courses necessary to pursue the problem selected; prior written consent of the instructor.

4970. Internship in Wildlife Management. 1 (Max. 1). Provides practical field experience in resource management for undergraduate credit. Satisfactory/unsatisfactory only. *Prerequisite:* consent of instructor.

4971. Internship in Zoology and Physiology. 1-3 (Max. 6). Provides practical experience in selected biological fields by working with a professional to help bridge the gap between academic and the world of work. Satisfactory/Unsatisfactory only. *Prerequisite:* consent of instructor.

4975. Practicum in Laboratory Instruction. 1-3 (Max. 6). For advanced students. Students will assist GAs and professors in laboratory preparation and demonstration in undergraduate teaching labs. Satisfactory/Unsatisfactory only. *Prerequisite:* consent of instructor.

5060. Fundamental Concepts in Evolution. 3. Explores fundamental concepts in evolutionary biology including evolutionary ecology, population genetics, and speciation with an emphasis on both theoretical frameworks and practical applications. Discussion included. Cross listed with ECOL/BOT 5060. *Prerequisite:* graduate student in good standing.

5050. Statistical Methods for the Biological Science. 3. General statistical analyses and their application to the biological and behavioral sciences. Analysis of variance, regression and correlation methods are studied from a data analytic perspective, emphasizing the conceptual understanding of where and when these techniques should be used and the interpretation of their results. Available computer programs will be utilized. Credit cannot be earned in more than one of the following courses: STAT 2020, 3050, 5050, 5060, 5070. Cross listed with STAT 5050. *Prerequisite:* one course in statistics (all introductory courses except 2000).

5100. Structure and Function of the Nervous System. 4. Aimed at understanding the structure and interconnections within the nervous system, and how structure gives rise to the complex functions mediated by the brain. This is an essential feature of neuroscience. Covers gross anatomy of the central and peripheral nervous system, followed by detailed consideration of the divisions of the brain and their functional significance. Cross listed with NEUR 5100. *Prerequisites:* admission to the graduate neuroscience program, or

graduate standing in another related program, or permission for undergraduate enrollment following discussion with the instructor.

5190. Comparative Environmental Physiology. 4. Studies and interprets principles of physiology which adapt animals to various environmental constraints. Introduces the discipline which has risen between the traditional fields of physiology and ecology and provides an understanding of animal distribution and survival. Dual listed with ZOO 4190. *Prerequisites:* LIFE 2022 or LIFE 2023 and CHEM 1030 or CHEM 1060. (Offered spring semester)

5235. Marine Biology. 3. This course explore major topics of physical oceanography, marine biodiversity and ecology, and human impacts on the ocean. Emphasis is placed on reading, evaluating, and synthesizing primary literature. Dual listed with ZOO 4235. Cross listed with BOT 5235. *Prerequisite:* graduate standing.

5270. Writing and Reviewing Science. 4. This course will help students prepare a scientific manuscript for submission to a peer-reviewed journal; in so doing, students will become more effective, efficient, and confident writers. Students will learn principles of effective writing, how to prepare a manuscript for publication, navigate the peer-review process, and write a constructive review. Cross listed with ENR 5270. *Prerequisite:* Students must have graduate standing and an analyzed dataset on which the manuscript will be based. Students must have approval from their advisors and key collaborators before embarking on this journey. Students are also encouraged to maintain this approval throughout the semester.

5280. Introduction to Neuroscience. 3. Examines the basic properties of neurons and from there identifies determinants of brain development and how neuronal circuits are formed. How neuronal circuits underlie processing sensory information, coordinated movement, complex functions (e.g. sleep, learning) and homeostasis are discussed. Cross listed with NEUR 5280; dual listed with ZOO 4280. *Prerequisite:* ZOO 3115 or equivalent.

5295. Neurodevelopment. 3. Through lecture and discussion of research articles, students learn mechanisms of nervous system development, from the birth and differentiation of neurons to the formation of synapses and circuits. Focus is on classical experiments done in vertebrates (*Xenopus* tadpole, chick, zebrafish, and mouse) and invertebrates (nematode and *Drosophila*). Dual listed with ZOO 4295; cross listed with NEUR 5295.

5300. Wildlife Ecology and Management. 5. Concepts of vertebrate ecology integrated with the art of wildlife management, stressing

approaches to deal with the inherent uncertainty of managing populations. Strategies to increase or decrease populations of target species, tools used to determine population status (e.g. viability analysis, monitoring, habitat assessment), and ecosystem management approaches are discussed. Lab included. Dual listed with ZOO 4300. *Prerequisites:* LIFE 3400, STAT 2050 or 2070, and ZOO 2450.

5310. Fisheries Management. 3. Acquaints students with theory and techniques of inland fisheries management. Includes methods of evaluating growth and recruitment, and the use of yield models in fisheries biology. Laboratory and field exercises included. Dual listed with ZOO 4310. *Prerequisite:* ZOO 4330.

5330. Ichthyology. 3. Studies anatomy, physiology, and classification of fishes, emphasizing classification and identification of Wyoming fish. Includes laboratory. Dual listed with ZOO 4330. *Prerequisite:* LIFE 2022 or 2023.

5340. Developmental Biology and Embryology. 4. Introduces study of vertebrate embryology and cellular differentiation. Includes gametogenesis, fertilization, blastulation and organogenesis, growth and differentiation, teratology, metamorphosis, regeneration, and asexual reproduction. Emphasizes mechanisms that create form and cellular differentiation. Dual listed with ZOO 4340. *Prerequisite:* one year of life science or one year of chemistry.

5350. Ornithology. 3. Acquaints students with classification, identification, morphology, distribution, natural history, and ecology of the birds of North America. Laboratory included. Dual listed with ZOO 4350. *Prerequisite:* LIFE 2022.

5370. Mammalogy. 3. Studies mammals of the world, emphasizing natural history, distribution, taxonomy, ecology, and morphology of mammalian species. Includes laboratory. Dual listed with ZOO 4370. *Prerequisite:* LIFE 2022 or 2023.

5380. Herpetology. 3. Introduces the ecology, behavior, morphology, evolution, systematics and conservation of reptiles and amphibians. Dual listed with ZOO 4380. *Prerequisite:* LIFE 2022.

5405. Winter Ecology of the Yellowstone Ecosystem. 2. Winter Ecology emphasizes the effects of winter abiotic conditions on organisms and organismal adaptations. Energy flux, snowpack physics, organismal adaptations, avalanche awareness, and the influence of winter on wildlife management are emphasized through lectures and field laboratories. Students will develop an independent research project and present their results. *Prerequisite:* graduate standing.

5400. Population Ecology. 3. Explores quantitative ecology of animal populations, emphasizing theoretical and empirical work. Provides modern coverage of principles of population ecology for wildlife majors and others who expect to deal with ecological problems in their careers. Dual listed with ZOO 4400. *Prerequisites:* LIFE 1010, 3400 and STAT 2050.

5415. Behavioral Ecology. 3. Behavioral ecology applies empirical and theoretical approaches to ecological and evolutionary underpinnings for behaviors ranging from foraging and predation to social grouping and mating systems. Emphasizes comparative analyses (what phylogenetic patterns exist across diverse species?) as well as genetic/fitness benefits (how do individuals benefit from apparently puzzling behaviors?). Dual listed with ZOO 4415. *Prerequisite:* ZOO 3600 or LIFE 3400.

5420. Ecological Inquiry. 3. Addresses basic ecological concepts and natural resource management issues in the Greater Yellowstone Ecosystem (GYE). Emphasis will be placed on developing critical thinking skills and exploring the effects of resource management policy and actions. Course direction will involve moving from a known facts way of thinking in to realm of evaluating effects of human management of the GYE. *Prerequisites:* LIFE 2022, 3400, and graduate standing.

5430. Ecology of the Greater Yellowstone Ecosystem. 3. Covers plant and animal community ecology from both a qualitative and quantitative perspective. Topics include: community interaction of plants and animals; community dynamics, succession, and disturbance; basic data collection and statistical analysis of habitat association data; and the effect of abiotic factors on community structure. *Prerequisite:* LIFE 2022, 3400, and graduate standing.

5500. Quantitative Analyses of Field Data. 3. A practical guide to the analysis of messy field data, including data exploration, generalized linear and additive models, mixed models, autocorrelation, and model selection using Program R. Students will spend one intensive week learning methods and the rest of the semester analyzing their own data and writing a manuscript. Cross listed with ECOL 5500. *Prerequisite:* graduate standing.

5530. R Intro for Wildlife Ecology. 1-4 (Max. 4). An intensive introduction to program R for graduate students in the fields of wildlife and fisheries ecology. Students will gain a general knowledge of R code and an ability to identify and solve problems for their particular data management and analysis needs.

5520. Habitat Selection. 3. In this course we will cover theory and behavioral/evolutionary concepts related to the process of habitat selection, the contexts under which habitat choices are adaptive or maladaptive, and different types of anthropogenic habitat change and the consequences for animals in the wild. Cross listed with ECOL 5520. *Prerequisite:* graduate students in good standing.

5540. Invertebrate Zoology. 4. Studies invertebrate phyla of the animal kingdom. Studies each phylum with respect to morphological and taxonomic characteristics; functional and evolutionary relationships; environmental adaptations; life cycles of representative types. Includes laboratory. Dual listed with ZOO 4540. *Prerequisite:* LIFE 2022.

5600. Research in Physiology. 1-16 (Max. 16). Opportunities are available for research in physiology and in animal behavior. Maximum credit not to exceed 8 hours for master's candidates and 16 hours for PhD candidates.

5650. Tropical Field Ecology Ecuador. 4. Course comprises 10 days in Ecuador in January (before spring semester), followed by one lecture per week during spring semester. Focus will be ecology, biodiversity and conservation of tropical forests and behavioral ecology of birds and mammals. Field site is at 1100m on west slope of the Andes. Dual listed with ZOO 4650; cross listed with ECOL 5650. *Prerequisite:* graduate standing.

5685. Neurophysiology. 3. Designed to investigate the structure and function of nervous systems, drawing information from both vertebrate and invertebrate organisms. Topics such as sensory systems, motor coordination and central integrative mechanisms are covered in addition to the basic neurophysiology of nerve cells. The laboratory complements the lecture sequence. Cross listed with NEUR 5685. *Prerequisite:* one course in physiology, chemistry, physics.

5690. Advanced Animal Behavior. 3. An advanced consideration of research in, and theory of, animal behavior. *Prerequisite:* senior or graduate standing in zoology or psychology.

5715. Seminar in Neuroscience. 2 (Max. 20). A continuing seminar. All students in the graduate neuroscience program are expected to register for this seminar each semester. The interdisciplinary approach to the nervous system is used employing work from physiology, neuroanatomy and neurochemistry, psychology, pharmacology, and biochemistry. Cross listed with NEUR 5715. *Prerequisite:* admission to the graduate neuroscience program or graduate standing.

5725. Transmission Electron Microscopy. 3. With the emphasis on modern techniques, course prepares students via theory and technical experience to use transmission electron microscopy in biological and material science research. An individual research project is required. *Prerequisite:* consent of instructor.

5735. Advanced Topics in Physiology. 1-4 (Max. 12). Designed to cover advanced topics in Physiology for students specializing in Physiology or related fields. Examples of topics include endocrinology, cardiovascular, renal, neurological, respiratory, and metabolic physiology. Integrative topics (e.g. circadian rhythms, thermal stress) may also be included. Dual listed with ZOO 4735. *Prerequisites:* ZOO 3115 or equivalent as approved by the instructor.

5740. Biological Confocal Microscopy. 2. With the advances of technology, confocal microscopy is an increasingly important tool for biological research. Teaches students the basic principles of confocal microscopy and its biological applications. This is a hands-on course and students have the chance to practice on a state-of-the-art confocal microscope.

5750. Research: Ecology. 1-16 (Max. 16). A wide variety of biotic communities, both terrestrial and aquatic, occur in Wyoming which afford excellent opportunities for ecological studies with responses of animals to the physical, chemical, and biotic factors of their environment. The research must be conducted under the supervision of a faculty member.

5820. Research in Vertebrate Fauna. 1-16 (Max. 16). Wyoming affords unusual opportunities for the study of a wide variety of vertebrate animals. The taxonomy, distribution, and certain aspects of the life histories of these animals are still inadequately known and afford excellent opportunities for research. Numerous problems concerning the management of our game animals remain to be investigated. The research must be conducted under the supervision of a zoology faculty member.

5840. Advanced Fisheries Management. 3. Familiarizes students in wildlife management and ecology with the advanced methods and techniques in fisheries management. *Prerequisite:* ZOO 4310/5310 and consent of instructor.

5890. Graduate Seminar. 1-4 (Max. 10). Provides an opportunity for graduate students to critically evaluate publications on zoological research. *Prerequisite:* 20 hours of biological sciences.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5930. Network Analysis. 2. Addresses problems in ecology, neurobiology, sociology, geography and behavioral ecology. Networks consists of entities (nodes) such as neurons, individuals or locations, linked by interactions (e.g., flow of information, pollen or behavior). Students will analyze topics of interest using R scripts. 2 hour lecture each week in spring semester. Cross listed with ECOL 5930. *Prerequisite:* graduate standing.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5980. Dissertation Research. 1-12 (Max. 48). Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate level degree program.

5990. Internship. 1-12 (Max. 12). *Prerequisites:* graduate standing.

The College of Business prepares students for careers by providing quality education in business disciplines, creating and disseminating knowledge, and assisting in Wyoming's economic development. The College of Business expects the highest level of integrity from our administration, faculty, staff, students, and alumni.

The College of Business grew from roots established in 1899 when the UW School of Commerce was founded. While the programs offered have changed over the years, the college remains firmly committed to academic excellence and positive student experiences.

The college has three academic departments: accounting and finance; economics; and management and marketing. The college also houses the College of Business Peter M. and Paula Green Johnson Student Success Center which is instrumental in maintaining the college's link with the business world.

These units are committed to preparing all College of Business students to enter our rapidly-changing world. Successful graduates are fully prepared to compete in their chosen professions or in graduate school. More importantly, they are well-educated individuals prepared to live fulfilling lives, and to meet the challenges presented by the complex ethical, moral and cultural contexts of our times.

College of Business Learning Outcomes

The College of Business expects that its graduates:

1. Will be competent in their field of study
2. Will be effective problem solvers
3. Will be ethical
4. Will be professional
5. Will be effective communicators

AACSB Accreditation

The business degree programs offered by the College of Business are accredited by AACSB-International. AACSB standards ensure that College of Business students are provided comprehensive, high-quality, well-rounded degree programs. The "Common Body of Knowledge" and the "Advanced Business Standing" (ABS) as described on the following pages have been developed to meet the AACSB accreditation standards.

Per accreditation guidelines, non-College of Business majors are limited to 30 hours of business courses.

A minimum of 50% of COB courses required for the major must be taken from the degree-awarding institution.

Programs of Study Undergraduate Degrees

BSB - Bachelors of Science in Business
BSE - Bachelors of Science in Economics

The Majors are as follows:

- Accounting (BSB - ACCT)
- Business Administration (BSB -ADMIN)
- Business economics (BSB - ECON)
- Entrepreneurship (BSB - ENTR)
- Finance (BSB - FIN)
- Management of Human Resources (BSB - HR)
- Marketing (BSB - MKT)
- Professional Sales (BSB - SALES)
- Economics (BSE - ECON)
 - o The BSE in Economics has two concentrations
 - 1) policy and 2) quantitative

The Minors are as follows:

- Accounting
- Banking and Financial Services
- Data Analytics
- Decision Science
- Economics
- Entrepreneurship (for non-business students only)
- Finance
- Hospitality Business Management
- International Business
- Leadership
- Management of Human Resources
- Marketing
- Professional & Technical Selling

Graduate Degrees

Master of Science

- Accounting
- Economics
- Finance

Master of Business Administration

Doctor of Philosophy

- Economics
- Marketing with emphasis on sustainability

Student Academic Advising

All College of Business undergraduate students, except economics majors, are advised by professional academic advisers in the College of Business Peter M. and Paula Green Johnson Student Success Center in room 60, Business Building. Advising can be reached by e-mail (success@uwyo.edu) or by phone (307-766-8249). Economics students are advised by William Campbell, room 279 West, Business Building.

Career Services

The Career Services unit connects students and employers in ways that lead to meaningful experiences and job opportunities. Business students are encouraged to explore career options and grow their career readiness by completing the Pokes Professionalism Badge and engaging in multiple internships. Students also have the option to apply for local, national, and international internships starting their first year and may be able to receive credit for their work. Networking with employers is highly encouraged and offered through a series of fairs, events, and in-class projects. One-on-one assistance and workshops are also available to students for things such as: internship or job searching; resume creation, review, or targeting; and career coaching or counseling. Individual appointments may be scheduled by email (success@uwyo.edu) or by phone, (307) 766-8249.

Student Responsibilities

College of Business students are responsible for knowing and meeting requirements for graduation. In addition to degree requirements, all College of Business students must complete the advanced business standing requirements prior to enrollment in most upper-division (3000/4000-level) College of Business courses (see Advanced Business Standing Prerequisites section).

All students must have already completed any prerequisites listed (in addition to ABS for COB students), including having the appropriate class standing. Class standing means for a 2000-level course, the student has **earned** a minimum of 30 hours; 3000-/4000- level courses, the student has **earned** a minimum of 60 hours. Students not meeting the prerequisites are identified and administratively dropped from those courses each semester.

Requirements for the Bachelor of Science Degree

Candidates for the Bachelor of Science degree in the College of Business must meet university, college, and departmental requirements. Degree candidates for the B.S. degree in the College of Business also must have a minimum 2.500 cumulative University of Wyoming (UW) grade point average and a 2.500 grade point average in College of Business courses at the time of graduation. In addition, economics majors also must hold a minimum 2.500 grade point average for all economics courses.

College of Business degree candidates must earn a minimum of 120 semester hours depending on major including:

I. University Studies Requirements:

All first year students who enter the University of Wyoming (UW) and students who enter a Wyoming Community College (CC) are required to meet the USP 2015 requirements for graduation. Wyoming CC students transferring to UW with an Associate of Arts or Associate of Science degree will have course work evaluated per the General Education Articulation Agreement between the University of Wyoming and Wyoming Community Colleges. Non-resident transfer students and Wyoming CC transfer students without an associate’s degree will have course work evaluated on a course-by-course basis, based on all approved USP courses.

Academic advisers will help students select the appropriate courses to satisfy university studies requirements. Some College of Business requirements also meet university studies requirements.

A. Basic skills (USP 2015)	Hrs.
1. First-year seminar (FYS) Choose from list of approved courses	3
2. Writing	
a. USP Communication 1 course	3
b. USP Communication 2 course—Mid-level communication or 2000-4000-level communication intensive course—Choose from list of approved courses	3
c. USP Communication 3 course—Upper-level communication or 3000-4000-level communication intensive course	3
3. Physical and Natural World (PN) (Two courses required—choose from list of approved courses)	6
4. Human Culture (H) (Two courses required—choose from list of approved courses)	6

5. U.S. and Wyoming Constitutions (V)	3
6. Quantitative Reasoning (Q)	3

II. Electives

The number of hours of elective credit and upper-division (3000-/4000-level) credit varies by department. Economics majors will take 51 hours of free electives. A maximum of 6 credit hours each at the freshman/sophomore and junior/senior-level military science courses may be applied to degrees in the College of Business.

A. Non-Business electives	Hrs.
1. Non-Business electives. May include MATH 1400	3-9

B. Free electives	Hrs.
1. Free electives from any college. May require upper-division (3000/4000-level) courses	18-24

Students may not take courses for S/U (satisfactory/unsatisfactory) credit to satisfy university studies or college requirements, course requirements in the major, or courses outside the college required by the major department curriculum.

III. Advanced Business Standing: (excludes Economics majors)

College of Business majors must satisfy the following advanced business prerequisites prior to enrolling in most upper-division (3000-/4000- level) College of Business courses:

1. Achieve junior standing by completing a minimum of 60 earned semester hours;
2. Complete 10 specific courses with a grade of C (not C-) or better in each. These ten courses are: ECON 1010 and 1020, USP Communication 1 and 2 courses, ACCT 2010 and 2020, IMGT 1400, MATH 2200 and 2205 or MATH 2350 and 2355 and STAT 2050 or 2070.
3. Achieve a cumulative UW institution grade point average or transfer grade point average of at least 2.500. Note: Transfer grades are not counted in the UW GPA (see UW Catalog http://www.uwyo.edu/registrar/university_catalog/grade.html for additional information). Transfer students who have not attended the University of Wyoming, and therefore do not have an established UW institutional/cumulative GPA, and who have completed the required ten (10) courses with a C or better, have 60 earned credit hours, and have a 2.500 cumulative TRANSFER GPA will be awarded ABS.

IV. Common Body of Knowledge: (excludes Economics majors)

College of Business majors take a common set of courses that expose them to the basic concepts, processes and technical skills necessary to complete a well-rounded high quality business education. The common body of knowledge includes FIN 3250, MGT 1040, DSCI 3210, IMGT 1400, MGT 3210, 4800, MKT 3210, ECON 1010, ECON 1020, ACCT 2010, and ACCT 2020. Grades of C (not C-) or above required.

V. Minimum requirements:

Achieve a cumulative College of Business and UW institution grade point average of at least 2.500. Complete 50% of the business credit hours from UW. Earn grades of C (not C-) or above in common body of knowledge and major specific core courses. Earn a passing score on the Senior Exit Exam required for all College of Business majors.

Requirements for Non-College of Business Majors

Students in non-College of Business majors who wish to enroll in College of Business upper-division courses need not meet the advanced business standing prerequisites. However, they are required to meet individual course prerequisites listed in the University Catalog, including class standing. This means for 2000-level courses, they must have earned a minimum of 30 hours. For 3000-4000-level courses, they must have earned a minimum of 60 hours.

In accordance with AACSB standards, students in non-College of Business majors may take no more than 25 percent of courses (30 hours) required for their degree programs in the College of Business.

Acceptance of Transfer Credit

The College of Business complies with UW policies regarding transfer credit discussed in the front section of this bulletin. The college has special course transfer arrangements with Wyoming community colleges that allow some courses taken at community colleges at the lower-division (freshman-sophomore) level to transfer for upper-division (junior) credit. Wyoming community college transfer students should contact the GJSSC for details.

Students transferring from other AACSB accredited colleges and universities will have their courses reviewed for transfer on a course-by-course basis.

The College of Business does not accept transfer credits for COB courses with equivalents at UW when the grade earned was less than a C.

Students must have an established 2.500 UW grade point average to transfer into the College of Business from across campus.

Business Administration and Accounting Online Programs

The College of Business offers students a business administration and an accounting degree accredited by *AACSB International* and delivered through distance education. The program is designed to help students maximize their flexibility in the business world and is delivered entirely online.

The Online BSAD and ACCT degrees are completion programs designed to allow students with a particular set of courses and requirements to complete the remainder of their bachelors degree online at the University of Wyoming. The BSAD and ACCT online degrees require students to have completed Advanced Business Standing (ABS) prerequisite coursework, which can be taken from an accredited Wyoming community college, other university or on campus at UW, before completing upper division coursework from the University of Wyoming.

Students will be required to apply to UW, have a 2.500 cumulative grade point average, and advanced business standing before being considered for admission into the business online administration and the online accounting program. Students must also attain a 2.500 GPA for graduation for both College of Business and UW courses, complete and submit an anticipated graduation date form, and must take the Senior Exit Exam to graduate.

To ensure you the availability of required courses in this program, enrollment into courses is managed and approved by the College of Business Peter M. and Paula Green Johnson Student Success Center.

College of Business Minors

Minors are available to on-campus students through the College of Business in the areas of accounting, banking and financial services, data analytics, decision science, economics, entrepreneurship (not available to College of Business majors), hospitality business management and leadership, finance, international business, management of human resources, marketing, professional and technical selling.

Minors requirements may often be met by simply focusing the elective credits available in a student's major.

The minors program consists of course requirements of 15 hours of study. A minimum grade of C (not C-) must be earned in each course. Certification of a successful minor program completion occurs as part of the DegreeWorks progress report, and the Office of the Registrar notes the completion of the minor on student transcripts. Minors must be approved by the Peter M. and Paula Green Johnson Student Success Center.

To earn a College of Business minor, students must first apply for admission to the minors program in the College of Business Peter M. and Paula Green Johnson Student Success Center in 60 Business Building. To be admitted to College of Business minors program, students must have a minimum 2.500 cumulative UW GPA. Students must maintain a cumulative 2.500 GPA in the required College of Business courses for the minor to be awarded. Non-College of Business students must meet the individual course prerequisites listed in the catalog, although they need not meet the advanced business standing requirements. A minimum of 50% of COB courses must be taken from the degree-awarding institution.

Accounting Minor

<i>Accounting Requirement</i>	
ACCT 3230.....	3
ACCT 3240.....	3
ACCT Elective from approved list**	3
<i>Advanced Business Electives</i>	
Any Business Course (3000-level or higher).....	3
Any Business Course (3000-level or higher).....	3
Minor Total Credits 15	

**Approved Electives: ACCT 3100, ACCT 4050, ACCT 4600, ACCT 4960, ACCT 4XXX, IMGT 3XXX.

Banking and Financial Services Minor

<i>Finance Requirement</i>	
FIN 4510	3
FIN 4540.....	3
FIN 4530.....	3
<i>Advanced Business Electives</i>	
Any Business Course (3000-level or higher).....	3
Any Business Course (3000-level or higher).....	3
Minor Total Credits 15	

Data Analytics Minor

<i>Course Code</i>	
DSCI 4240.....	3
ECON 4230 or ECON 4530.....	3
IMGT 3XXX or ACCT 4XXX	3
<i>Advanced Business Electives</i>	
Any Business Course (3000-level or higher).....	3
Any Business Course (3000-level or higher).....	3
Minor Total Credits 15	

Decision Science Minor

<i>Decision Science Requirement</i>	
DSCI 4240.....	3
DSCI 4260.....	3
DSCI 4280.....	3
<i>Advanced Business Electives</i>	
Any Business Course (3000-level or higher).....	3
Any Business Course (3000-level or higher).....	3
Minor Total Credits 15	

Economics Minor

<i>Economics Requirement</i>	
ECON 3010.....	3
ECON 3020.....	3
<i>Advanced Economics Electives</i>	
Any ECON Course (excl. 3010, 3020).....	3
Any ECON Course (4000-level).....	6
Minor Total Credits 15	

Entrepreneurship Minor (non-College of Business majors)

<i>Entrepreneurship Requirement</i>	
ENTR 2700.....	3
ENTR 3700.....	3
ENTR 4700.....	3
<i>Electives from approved list.*</i>	
Minor Total Credits 15	

*Approved Electives for the Entrepreneurship Minor: MKT 4590, MGT 3110, MGT 3410, MGT 3420, MGT 4360, MGT 4470, MGT 4550, MKT 3310, MKT 4310, ACCT 3100, DSCI 4230, AGECE 4965, COJO 3010, ES 4920, ENTR 4750, ENTR 3020.

Finance Minor

<i>Finance Requirement</i>	
FIN 3310	3
FIN 4520.....	3
FIN Elective (3000-level or higher).....	3
<i>Advanced Business Electives</i>	
Any Business Course (3000-level or higher).....	3
Any Business Course (3000-level or higher).....	3
Minor Total Credits 15	

Hospitality Business Minor

Required Courses

HOSP 2000	.....3
HOSP 3000	.....3
HOSP 4800	.....3
Any Approved Elective Course within One Core Area	.....3
Any Approved Elective Course within Same Core Area	.....3

Minor Total Credits 15

Approved Elective Courses (choose any courses totaling 6 credits from one focal core)

FCSC 1141	.....3
FCSC 1150	.....3
FCSC 4900	.....3
HOSP 2320*	.....3
HOSP 2330*	.....3
HOSP 2535*	.....3
HOSP 2540*	.....3
ORTM 1000	.....3
ORTM 3000	.....3
HOSP 1540*	.....3
HOSP 2525*	.....3
HOSP 2530*	.....3
HOSP 4910	.....3
ENTR 2700	.....3
MGT 3410	.....3
MKT 4240	.....3
MKT 4230	.....3
MKT 4440	.....3
SELL 3310	.....3
HOSP 1560*	.....3

* These courses are offered through Casper College via distance education.

The following courses are also acceptable transferrable electives but are only offered in-person at community colleges around the state:

FSHM 2540	.....2
FSHM 2600	.....2
FSHM 2700	.....3
HRM 1505	.....3
HRM 1510	.....3
HRM 1515	.....3
HRM 2500	.....3
HRM 2525	.....3
HRM 2530	.....3
FSHM 2610	.....2
HRM 1501	.....3
FSHM 2520	.....3

Note: FSHM classes are offered in person at Sheridan College in Sheridan, WY HRM classes are offered in person at Central Wyoming College in Jackson, WY.

International Business Minor

Required Courses

INBU 1040	.....3
INBU 3110	.....3
MGT 3460 OR MKT 4540	.....3
Any Approved Elective Course	.....6

Minor Total Credits 15

Approved Elective Courses

ECON 1000	.....3
INBU 4900	.....3
INBU 4910	.....3
MGT 3460	.....3
MKT 4540	.....3
MGT 4600	.....3
Upper Division Business Elective Credit Taken Abroad	.....3-6
ANTH 2200	.....3
GEOL 1600	.....3
INST 2350	.....3
INST 4100	.....3
POLS 2310	.....3
REL 1000	.....3
One Semester in Any Language	.....4

IB Minor Students must participate in a for-credit Education Abroad program, approved through the Global Engagement Office (this may include Faculty-Directed programs, internships abroad, study abroad opportunities, etc.) *International Students currently studying “abroad” at the University of Wyoming would also meet this requirement. Student must have applied as an international student and must report though through the International Student Services Office.

Leadership Minor

Leadership Foundations

LEAD 21103
MGT 31103

Capstone Project

LEAD 41103
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Leadership Electives -complete a minimum of 6 credits with courses from the below list

AGRI 4600	.....3
AGRI 4700	.....3
AIR 2010	.....1.5
AIR 2020	.....1.5
AIR 3010	.....3
ARMY 2010	.....2
ARMY 2020	.....2
ARMY 2060	.....2
ARMY 3010	.....3
ARMY 3020	.....3
CNSL 2200	.....2
CNSL 3010	.....2
CRMJ 4130	.....3
ENR 2800	.....3
ERS 2000	.....3
FCSC 4117	.....3
MGT 3420	.....3

NURS 4830	.....2
NURS 4835	.....2
WMST 1900	.....3
UWYO 3000	.....3

Extra- and Co-curricular Leadership Experience

Cowboy Leadership Certification15
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Minor Total Credits 15

Management of Human Resources Minor

Management Requirement

MGT 3410	.....3
HR Elective 1*	.....3
HR Elective 2*	.....3

Advanced Business Electives

Any Business Course (3000-level or higher)	.....3
Any Business Course (3000-level or higher)	.....3

Minor Total Credits 15

*Approved Electives for the Management of Human Resources Minor: MGT 4220, MGT 4240, MGT 4260, MGT 3100.

Marketing Minor

Marketing Requirement

MKT 42403
MKT 45203

Marketing Approved Elective Courses

(3000-level or higher)*3
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Advanced Business Electives

Any Business Course (3000-level or higher)3
Any Business Course (3000-level or higher)3

Minor Total Credits 15

*Approved Electives for the Marketing Minor: MKT 4230, MKT 4440, MKT 4540, MKT 4590, MKT 4910, SELL 3310

Professional and Technical Selling Minor

Professional and Technical Selling Requirement

SELL 3310	.....3
SELL 4310	.....3
SELL 4320	.....3

Advanced Business Electives

Any Business Course (3000-level or higher)	.....3
Any Business Course (3000-level or higher)	.....3

Minor Total Credits 15

**Cooperative Undergraduate Programs
The Concentration in Environment and Natural Resources**

College of Business majors may earn a cross major in Environment and Natural Resources (ENR) in cooperation with the UW School of Environment and Natural Resources. The appropriate use of natural resources and awareness of environmental consequences of decisions have become major

issues for business. Exposure to ideas, skills and sensibilities in these areas is critical to future business people. Students majoring in economics may elect an environment and natural resources concentration in which an economics approach to problem solving is stressed. For more information call the ENR office at (307) 766-5089.

Graduate Study

The College of Business is comprised of three academic departments: accounting and finance, economics, and management and marketing. The faculty of these departments cooperate in the presentation of graduate work leading to the following degrees:

- Master of Business Administration
- Master of Science in Accounting
- Master of Science in Economics
- Master of Science in Finance
- Doctor of Philosophy in Economics
- Doctor of Philosophy in Marketing
with an emphasis on sustainability

The College of Business faculty is firmly committed to the excellence of its graduate programs. The graduate programs in the College of Business are accredited by AACSB-International.

The three academic departments coordinate course offerings to support all of the graduate degree programs; the M.B.A. program in particular is a college-wide effort.

Minor in Environment and Natural Resources

College of Business graduate students may earn an interdisciplinary minor in environment and natural resources (ENR) in cooperation with the UW School of Environment and Natural Resources. The appropriate use of natural resources and awareness of environmental consequences of decisions have become major issues for all areas of business and economics. The School of Environment and Natural Resources is designed to move beyond the strictly disciplinary design and management of their long-term solutions. The school seeks to attract outstanding graduate students from a variety of disciplines, who are eager to pursue careers that engage other professionals, policymakers, and the public in finding innovative ways to resolve complex environmental and natural resource issues. To pursue a minor in ENR, students must first be admitted to another master's or doctoral degree program offered at the University of Wyoming. For more information call the ENR office at (307) 766-5080.

Business (BUSN)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1101. First-Year Seminar. 3. [(none)◀▶FYS]

Department of Accounting and Finance

**252 East Business Building,
(307) 766-3136**

FAX: (307) 766-4028

Web site: www.uwyo.edu/acct-fin

Department Chair: Nicole Choi

Professor:

ERIC N. JOHNSON, B.A. Whittier College 1978; M.B.A. Arizona State University 1982; Ph.D. 1989; Clara R. Toppan Professor of Accounting 2011; Professor of Accounting 2013, 2011.

Associate Professors:

NICOLE CHOI, B.A. Chungbuk National University 2002; M.B.A. Washington State University 2004; Ph.D. 2009; Associate Professor of Finance 2015, 2009.

ALI NEJADMALAYERI, B.Sc.

University of Tehran 1993; M.B.A. Texas A&M University-Kingsville 1997; Ph.D. University of Arizona 2001; John A. Guthrie Endowed Chair in Banking and Financial Services; Associate Professor of Finance 2018.

MITCHELL OLER, Bachelors of Commerce, University of Alberta 1997; M.S. Brigham Young University 1998; Ph.D. University of Washington 2006. Associate Professor of Accounting 2019, 2015.

Assistant Professors:

MACKENZIE FESTA, B.S. West Virginia University 2010; M.P.A. 2013; Ph.D. 2017; Assistant Professor of Accounting 2017.

PAWAN JAIN, B.S. Chattrapati Sahuji Maharaj University 2000; M.S. 2002; M.S. University of Wyoming 2008; Ph.D. 2008; Ph.D. University of Memphis 2013; Assistant Professor in Finance 2016.

AARON ROSENBLUM, B.A. University of Central Florida 2010; M.S. Florida State University 2013; Ph.D. 2018; Assistant Professor of Finance 2018.

TENG (TIM) ZHANG, B.S. Shandong University 2010; M.S. University of North Carolina at Chapel Hill 2012; Ph.D. Georgia Institute of Technology 2015; Assistant Professor of Finance 2018.

KENNETH ZHENG, B.A. Southwestern University of Finance and Economics, China; M.S. University of Texas at Dallas 2007; Ph.D. University of Texas at Dallas, 2011; Assistant Professor of Accounting 2015.

Academic Professionals:

JANICE A. BENSON, B.S. Kansas State University 1991; M.B.A. 1993; Senior Lecturer of Accounting 2010, 1999.

EVEN BRANDE, B.S. University of Wyoming 1991; M.B.A. 1993.

JENN DORWART, B.S. Chadron State College 2004; M.S. 2007; D.B.A. Walden University 2016; Assistant Lecturer of Finance 2019.

JAMES GUNDERSON, B.A. University of Nebraska 1977; Ph.D. University of Minnesota 2004; Assistant Lecturer in Finance 2014.

JENNIFER A. KREISER, B.S. University of Alabama 2001; M.S. 2002; Senior Lecturer 2019.

AMBER MERCIL, B.S. University of Wyoming 2004; M.S. University of Oregon 2006; Graduate Coordinator in Accounting; Assistant Lecturer of Accounting 2014.

TOMMY RAULSTON, B.S. Cameron University 1987 M.S. Oklahoma State University 1991; Assistant Lecturer of Accounting 2015.

JIM ROBINSON, B.S. University of Wyoming 1976; M.S. in Finance 1979; M.S. in Economics 1994; Assistant Lecturer in Finance 1985.

PHILIP W. TREICK, B.S. University of South Florida 1987; Assistant Lecturer in Finance 2016.

Emeriti:

Penne L. Ainsworth
Richard G. Elmendorf
George R. McGrail
Suzanne S. Roe
Frederic P. Sterbenz
Kenton B. Walker
Stuart K. Webster

Accounting Major

The basic objectives of the accounting program are twofold: to provide students who do not intend to major in accounting with the basis for understanding the role accounting plays in business today; and to provide those students who desire to major in accounting with the educational background necessary for lifelong learning and a rewarding career in the accounting profession. The curriculum offered by the department attempts to blend the conceptual with the practical. Exposure to the underlying conceptual framework of accounting provides a basis for dealing with

emerging accounting issues, while examination of technical pronouncements enables students to gain insight into practical issues encountered in an accounting environment.

Accounting majors may enter the professional world of accounting from a variety of directions. Choices available in the form of elective courses enable students to chart a course that leads them toward public accounting, private accounting, governmental or not-for-profit accounting, as well as other specialties that rely on a strong accounting background. Those students seeking professional certification, such as the CMA or CIA, are able to satisfy requirements to sit for these professional examinations by completing the undergraduate accounting degree.

All accounting majors must comply with requirements of the advanced business prerequisites for enrollment in upper-division courses and must complete the common body of knowledge courses as listed previously. All accounting courses for the major require a minimum grade of C (not C-).

In addition to university and college requirements cited previously, requirements for accounting majors include:

Accounting Major

Accounting Core18

ACCT 3070, 3230, 3240, 3430, 3610, 4060

Accounting Elective3

ACCT 3100, 4050, 4600 or 4960

Advanced Business Electives6

3000-4000 level

Free Electives from any college..... 21

A complete curriculum sheet is available from the College of Business Peter M. and Paula Green Johnson Student Success Center in Room 60 West of the College of Business Building.

Please Note:

Students who anticipate preparing themselves for the CPA examination following completion of their degree should be aware of the Wyoming statute governing eligibility to sit for the exam. Please see the state board's web site for information: cpaboard.state.wy.us. The current combined curricula (B.S. and M.S.) enable students to satisfy the educational requirements to sit for the CPA exam in Wyoming and other jurisdictions.

Graduate Study

Accounting is an integral part of the College of Business degree programs. The department offers courses in support of college graduate degree programs, as well as a master of science in accounting (MS in Accounting) degree. The MS in Accounting degree was developed in response to emerging needs of the accounting profession. Those students who wish to become professional accountants, whether that be in a corporate setting, a not-for-profit setting, or public accounting, will find the MS in Accounting degree to be one that enables them to develop both the personal and professional skills needed to enjoy a productive career.

The MS in Accounting program satisfies the Wyoming requirements for individuals to take the Certified Public Accountant (CPA) exam and it further develops students' professional skills. The MS in Accounting program focuses on the two main areas of development: 1) advanced accounting and business education, and 2) professional skills development—including written, oral, interpersonal communication, computer applications, critical thinking, and adaptability.

The MS in Accounting degree is designed for students who have completed an undergraduate degree in accounting in the United States. However, it is possible to be admitted to the program once deficiency courses are successfully completed. Those holding a bachelor's degree from within the U.S., but not in accounting, and international applicants can still apply for admission once the deficiency courses are successfully completed. We do not provisionally or conditionally admit students to our program.

Program Specific Admission Requirements

Admission to the Master of Science in Accounting program generally requires:

- Completed university application and nonrefundable application fee.
- A cumulative undergraduate GPA of 3.000 and a minimum GPA of 3.000 in accounting courses, preferred. Based on a 4.000 scale.

- A total score of 550 or better on the GMAT (Graduate Management Admissions Test) or a combined score of 300 or better on the GRE (Graduate Record Examination). GMAT and GRE scores must be sent directly to the MS Accounting Program. The institution code for the GRE is 4855.
- Official transcripts of all undergraduate and graduate coursework (post-secondary) must be sent directly from the issuing institution to the University of Wyoming Office of Admissions. Official University of Wyoming transcripts do not need to be requested sent to the department. Copies of all transcripts must also be uploaded into the UW Graduate Admissions Application.
- Letters of recommendation (3). Professional or education-related letters of recommendation provided directly by the reference via the UW Graduate Admissions application.

Additional requirements for International Applicants:

- Provide proof of satisfactory English ability if native language is not English by completing the TOEFL or IELTS exam. The minimum acceptable TOEFL score is 540 on the paper-based test or a score of 76 on the internet-based test. The minimum acceptable IELTS score is 6.5
- International students must also prove sufficient financial resources as establish by the University of Wyoming, Graduate International Student Admissions.

Additionally, to be admitted to the Master of Science in Accounting program, a student must have a bachelor's degree and must have completed courses in the following core areas:

- Accounting (U.S. GAAP, U.S. tax code, U.S. auditing, managerial accounting)
- Finance
- Management
- Marketing

Coverage in these courses must include:

- Ethical and global issues
- Political, social, legal, and environmental issues
- Technological issues

- The impact of diversity on organizations

Application Deadlines

Fall admission: all required application materials are due by May 1.

Spring admission: all required application materials are due by December 1.

International applicants: Please be advised that there are additional university requirements that may take additional processing time - you are encouraged to apply prior to the application deadline if possible to ensure that if admitted, all required documentation can be provided prior to the term of entry.

Note: These are the minimum requirements and do not guarantee admission or funding. Students who have earned their undergraduate degree in Accounting from a United States AACSB accredited institution with the minimum preferred GPA are *eligible* to have the GMAT/GRE required waived on a case-by-case basis. Please contact program office for additional information. For a comprehensive list of United States AACSB accredited schools, please visit the AACSB webpage.

Program Specific Degree Requirements

Master of Science in Accounting

The objectives of the master of science in accounting are:

- To provide students with an advanced understanding of the field of accounting,
- To provide students with specific advanced knowledge of the sub-topics within accounting,
- To provide students with professional skills that will enable them to enjoy productive and rewarding careers in accounting and other accounting-related areas.

The program consists of a minimum of 30 semester hours of graduate coursework. Students must complete coursework in accounting and elective business and/or non-business areas. Eighty percent of the student's total coursework must consist of 5000-level courses; the remaining 20 percent may be 4000-level non-accounting courses (approximately six hours). Non-accounting courses should be selected in consultation with the student's graduate adviser. Non-accounting courses at the 4000-level may be taken during the senior year of undergraduate study and applied to the master's program, but they must be reserved for graduate credit and approved by the graduate program director, prior to the first day of such classes.

Students must take these 5 core accounting courses (minimum 15 credit hours):

- ACCT 5030. Advanced Financial Accounting
- ACCT 5040. Seminar in Managerial Accounting
- ACCT 5060. Auditing II
- ACCT 5070. Tax II Accounting Elective

A maximum of six hours may come from 4000- or 5000-level courses offered in the College of Business or in other colleges at the University of Wyoming.

NOTE: ACCT 4010, 4020, 4050, 4060, 4100, 4600, 4900, and 5000 are not applicable for M.S. accounting students' programs of study.

The student must complete the required coursework (both graduate and prerequisite) with a minimum GPA of 3.000 (on a 4.000 scale).

A student may have only one C in his or her program of study.

Any student falling below a cumulative GPA of 3.000 is automatically placed on probation for the following semester and must raise their GPA to 3.000 to avoid dismissal.

Students earning a grade lower than a C or a second C will be dismissed.

Students must maintain good academic standing at the program and university level and receive no letter grade of D or F. If a letter grade of D or F is received, the student will be immediately dismissed from the program.

Accounting (ACCT)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

2010 [1010]. Principles of Accounting I. 3. Provides a basic understanding of the financial accounting information role in business and society. Focuses on the recording and reporting of business operating, financing, and investing events. Provides insights on business and enables students to become familiar with shareholder/external party reporting conventions. *Prerequisites:* Sophomore class standing and MATH 1400.

2020. [1020]. Principles of Accounting II. 3. Provides a basic understanding of the managerial accounting information role in business decision-making. Provides insights on how businesses operate and enables students to become familiar with the conventions used by

business to make decisions and how accounting information is reported to managers. *Prerequisite:* ACCT 2010, Sophomore class standing. **2110 [3110]. Managerial Accounting. 3.** An introductory course concerned with the use of accounting information by nonaccountants for planning, product costing, performance assessment and non-routine decision making. Not available for credit for accounting majors. *Prerequisites:* ACCT 2010 and 2020 (or equivalents); non-accounting majors.

3070. Tax I. 3. This class covers a broad range of the tax concepts applicable to the taxation of individual taxpayers. Special emphasis will be placed of the role of taxation of the individual and the related decision-making process. *Prerequisites:* ACCT 2010 and ACCT 2020, with grades of C or better in each, MATH 1400.

3100 [4100, 2000, 3000]. Financial Statement Analysis. 3. Advanced study of financial statements and how to analyze those statements from both an internal and external perspective. *Prerequisites:* ACCT 2010, ACCT 2020, and FIN 3250 (or equivalent) or concurrent enrollment, sophomore class standing.

3230 [2230]. Intermediate Accounting I. 3. First of two courses studying financial reporting. Topics include recording and reporting events in the expenditure and revenue cycles. *Prerequisites:* ACCT 2020 and MATH 1400 with grades of C or better in each; sophomore standing.

3240 [2240]. Cost Accounting I. 3. Organizational uses of information to plan, make decisions, and evaluate performance. Specific topics include job order and process costing, cost estimation and CVP analysis, budgeting and variance analysis. *Prerequisites:* ACCT 2020 and MATH 1400 with grades of C or better in each; sophomore standing.

3430. Intermediate Accounting II. 3. Second of two courses studying financial reporting. Topics include debt, equity, revenue recognition, and special issues in expense and liability recognition. *Prerequisites:* ACCT 3230 with grade of C or better; advanced business standing, or special premission of Department Head.

3610 [2040, 3010]. Accounting Information Systems. 3. Provides an understanding of accounting information systems and internal controls. Emphasis on the use of current accounting technology, accounting software and internal control systems. *Prerequisites:* ACCT 3230 with a grade of C or better; advanced business standing.

4010. Accounting Information Systems II.

3. Advanced topics in accounting information systems. Focuses on a database approach to accounting system design and also explores special topics in accounting system technology. May be partially taught in a lab setting. *Prerequisites:* ACCT 3610 and 3830 (or equivalents) with grades of C or better in each; advanced business standing. (Offered based on sufficient demand and resources.)

4020. Information Security. 3. Investigation, prevention and control surrounding the protection of business related data, information and technology resources. Includes the use of industry supported frameworks aimed at the evaluation of threats; design of information security architectures; implementation processes; reporting and monitoring, along with ongoing maintenance, intrusion detection, security log analysis, and contingency planning. Cross listed with IMGT 4020. *Prerequisite:* IMGT 3400 or ACCT 3610.

4050. Governmental and Nonprofit Accounting. 3. Designed to introduce students to accounting for state and local governmental entities and nonprofit organizations. Students learn about the entity structure, accounting practice, accounting systems and reporting practices for these organizations. *Prerequisites:* ACCT 3230 with a grade of C or better; advanced business standing.

4060. Auditing I. 3. A study of the scope, activities, and responsibilities of professional auditors. Topics include assurance services by public accountants and professional judgment in the process of assessing risks, planning and performance audit procedures, and reporting on financial fairness. *Prerequisites:* ACCT 3430 with a grade of C or better; ACCT 3610 with a grade of C or better (or concurrent enrollment); advanced business standing.

4540. Cost Accounting II. 3. Advanced topics in cost accounting concerning the organizational uses of information to plan, make decisions, and evaluate performance. *Prerequisites:* ACCT 3240 with a grade of C or better and sophomore standing.

4600. Professionalism and Ethics. 3. Examines professional ethics for accountants from both a philosophical and business perspective. Moral development, ethical reasoning, and ethical decision making provides a framework for examining the importance of ethics in the accounting profession. Professional guidance on ethics in accounting is also examined, including the AICPA Code of Professional Conduct, the Sarbanes-Oxley Act, and the codes for other professional accounting organizations. *Prerequisites:* ACCT 3070, 3610,

and 3430 (or equivalents) with grades of C or better in each; ACCT 4060 with a C or better or concurrent enrollment; advanced business standing.

4830. Survey of International Accounting. 3. Introduction to international accounting practices and current developments. Includes an exploration of cultural, historical, and political reasons for international accounting practice diversity; an introduction to International Accounting Standards; tracking current developments in the process of convergence; and an introduction to international auditing standards and ethical expectations of accountants world-wide. Dual listed with ACCT 5830. *Prerequisites:* ACCT 3430 (or equivalent) with a grade of C or better; advanced business standing.

4900. Problems in Accounting. 1-4 (Max. 4). An arrangement whereby students may investigate a particular problem area in accounting on an individual basis. *Prerequisites:* 6 hours in accounting; advanced business standing; junior standing; and written consent of instructor. (Offered based on sufficient demand and resources)

5030. Advanced Financial Accounting. 3. Advanced topics in financial reporting for students planning careers as professional accountants. Topics may include: business combinations, consolidated financial reporting, segment and interim reporting, SEC reporting, multinational accounting and reporting, and other emerging topics. *Prerequisites:* ACCT 3830 (or equivalent) with a grade of C or better; graduate standing.

5040. Seminar in Managerial Accounting. 3. Organizational development of financial and nonfinancial budgets, interaction between performance measurement systems and human behavior, and advanced topics in uses of information for decision making. *Prerequisites:* ACCT 3240 (or equivalent) with a grade of C or better; graduate standing.

5060. Auditing II. 3. An in-depth study of the financial statement audit and the professional responsibilities of public accountants. The role of professional judgment and skepticism is emphasized in case studies and research involving current auditing issues, including financial statement fraud. *Prerequisites:* ACCT 4060 (or equivalent) with a grade of C or better; graduate standing or instructor and program director permission.

5065. Fraud Examination. 3. The study of fraud against organizations and individuals. Includes consideration of how and why fraud is committed, the basics of fraud investigation, and fraud prevention. Coverage may also

include an in-depth study of specific fraud cases based on the above elements. *Prerequisites:* ACCT 4060 (or equivalent) with a grade of C or better; graduate standing or instructor and program director permission.

5066. Seminar on Management Fraud. 3. An in-depth study and analysis of the causes, methods, and consequences of financial statements fraud committed by top management in the organization. The course covers psychological and criminological theories of management fraud, as well as detailed analysis of high-profile managements frauds. Seminar format. Cross listed with MBAM 5404. *Prerequisite:* graduate standing or permission of instructor.

5070. Tax II. 3. Choice of entity and special tax subjects. Emphasis will be placed on the importance of ethical considerations, competent tax research, and thoughtful tax planning. *Prerequisites:* ACCT 3070 (or equivalent) with a grade of C or better; graduate standing.

5075. Individual and Estate Tax Planning. 3. Focuses on tax-planning strategies and techniques. Investigates a wide variety of topics, ranging from individual issues to estate, gift, trust, and small business tax planning. *Prerequisites:* ACCT 3070 (or equivalent) with a grade of C or better, graduate standing.

5503. Fundamentals of Accounting in the Energy Industry. 3. Introduces students to basic financial accounting and reporting issues related to energy producing activities. Specifically, the course will investigate current accounting practices of energy producing companies related to exploration, acquisition, development, and delivery of energy products. The course will also cover financial requirements of the Financial Accounting Standards Board (FASB), the International Accounting Standards Board (IASB), and the Securities and Exchange Commission (SEC). Cross listed with MBAM 5503. *Prerequisite:* Permission of MBA Program Director, or student's graduate program coordinator in consultation with MBA Program Director.

5650. Seminar in Accounting Information Systems. 3. An advanced study of the implications of information systems for accountants with emphasis upon accounting application as well as the body of knowledge required for the accountant who is expected to provide relevant, significant data for an increasingly wide range of purposes. *Prerequisites:* ACCT 3610 (or equivalent) with a grade of C or better; graduate standing.

5830. Survey of International Accounting. 3. Introduction to international accounting practices and current developments. Includes

an exploration of cultural, historical, and political reasons for international accounting practice diversity; an introduction to International Accounting Standards; tracking current developments in the process of convergence; and an introduction to international auditing standards and ethical expectations of accountants world-wide. Dual listed with ACCT 4830. *Prerequisites:* ACCT 3430 (or equivalent) with a grade of C or better; graduate standing and admission to the Master of Science in Accounting Program.

5850. Advanced Problems in Accounting. 1-8 (Max. 8). An arrangement whereby students may investigate a more advanced problem area in accounting on an individual basis. *Prerequisites:* consent of instructor; graduate standing.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: Credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrollment in a graduate degree program.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

Information Management (IMGT)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

1400 [2400]. Introduction to Business Analytics. 3. Concerned with the role of information systems in managing organizations to make them more competitive and efficient. Specific topics include organizational and technical foundations of information systems and building and managing systems. Special emphasis will be made on learning hands on tools that are easily accessible to students, including Microsoft Excel and Microsoft Access. *Prerequisite:* MATH 1400.

3400. Database Management Systems. 3. Concerned with the fundamentals of modern database information systems. Specific topics include database systems design, entity-rela-

tionship models, relational, hierarchical, and network database models, query languages, and data warehousing. *Prerequisite:* IMGT 1400. **4020. Information Security. 3.** Investigation, prevention and control surrounding the protection of business related data, information and technology resources. Includes the use of industry supported frameworks aimed at the evaluation of threats; design of information security architectures; implementation processes; reporting and monitoring, along with ongoing maintenance, intrusion detection, security log analysis, and contingency planning. Cross listed with ACCT 4020. *Prerequisite:* IMGT 3400 or ACCT 3610.

4455 [3450]. Systems Analysis and Design. 3. Concerned with the analysis, management, and conceptual design of information systems. Specific topics include systems planning, requirements analysis, business process modeling and redesign, flexibility analysis, alternative analysis, and architectural selection and design focused on supporting an organization's business requirements through various system design methodologies. Cross listed with MGT 4455. *Prerequisites:* IMGT 1400 and Advanced Business Standing.

4990. Contemporary Topics in Information Management. 1-3 (Max. 6). Concerned with contemporary topics in information management and serves as elective credits for a minor in information management. A variety of subjects may be considered for this course including corporate information systems, object oriented technology, management of information technology, decision support systems, and data communication and network. *Prerequisites:* IMGT 3400 or concurrent enrollment. (Offered based on sufficient demand and resources)

Finance Major

Modern Business is characterized by its emphasis upon finance. The application of sound financial management principles often will be the difference between success and failure in business.

Courses prescribed for those who wish to major in finance are designed to provide a background for financial management of business concerns and, if students desire, to specialize in bank management, corporation finances and investment management. Since financial policies of business enterprises are subject to economic principles which make all businesses financially interdependent and sensitive to disturbances in the economic structure, students in this field should study

the economic, as well as the technical, administrative aspects of finance and accounting. Prescribed work in this area attempts to emphasize all three phases of the subject.

All finance majors must comply with requirements of the advanced business prerequisites for enrollment in upper-division courses and must complete the common body of knowledge courses as listed previously. All finance courses for the major require a minimum grade of C.

In addition to university and college requirements cited previously, requirements for finance majors include:

Finance Major

Finance Core	12
ACCT 3100, FIN 3310, 4400, 4250	
Finance Elective	3
FIN 3520, 4340, 4350, 4360, 4510, 4530, 4540 or 4710	
Advanced Business Electives	6
3000-4000 level	
Free Electives from any college.....	27
6 of 27 required hours must be 3000-4000 level	

A complete curriculum sheet is available from the Academic Advising unit of the GJSSC of the College of Business Building.

Graduate Study

The Master of Finance program will allow students to obtain advanced training built on the foundations of principles and practices of modern finance. The MS in Finance is a rigorous, yet practical program that encompasses the fundamentals as well as cutting-edge topics in investment analysis, portfolio management, financial modeling, risk management, and fixed income securities. The MS in Finance program aims to make you well prepared to evaluate and react to change with confidence and to develop effective solutions to meet the needs of markets and industries.

The objectives of the master of science in finance are:

- To provide students with an advanced understanding of the field of finance.
- To provide students with specific advanced knowledge of the subtopics within finance.
- To provide students with professional skills that will enable them to enjoy productive and rewarding careers in finance and other finance-related areas.

Program Specific Admission Requirements

Admission to the Master of Science in Finance program generally requires:

- Completed university application and nonrefundable application fee.
- A cumulative undergraduate GPA of 3.000 and a minimum GPA of 3.000 in finance courses, preferred. Based on a 4.000 scale.
- A total score of 550 or better on the GMAT (General Management Admissions Test) or a combined score of 300 or better on the GRE (Graduate Record Examination). SMAT and GRE scores must be sent directly to the MS in Finance Program. The institution code for the GRE is 4855.
- Official transcripts of all undergraduate and graduate coursework (post-secondary) must be sent directly from the issuing institution to the University of Wyoming Office of Admissions. Official University of Wyoming transcripts do not need to be requested sent to the department. Copies of all transcripts must also be uploaded into the UW Graduate Admissions Application.

Additional Requirements for International Applicants:

- Provide proof of satisfactory English ability if native language is not English by completing the TOEFL or IELTS exam. The minimum acceptable TOEFL score is 540 on the paper-based test or a score of 76 on the internet-based test. The minimum IELTS score is 6.5.
- International students must also prove sufficient financial resources as established by the University of Wyoming Graduate International Student Admissions.

NOTE: Students who have earned their undergraduate degree in a business or a STEM related field from a United States regionally accredited institution with a minimum of preferred GPA or who have 3+ years of professional work experience in a financial services or related field are *eligible* to have the GMAT/GRE requirement waived on a case-by-case basis. Please contact program office for additional information.

Prerequisites

No prerequisite courses will be required if you have completed a business bachelors or masters degree from a regionally accredited college or university with the minimum preferred GPA of 3.000 on a 4.000 scale or if you have 3+ years of professional work experience in a financial services or related field.

Applicants without a business related undergraduate or graduate degree or without 3+ years of professional work experience in a financial services or related field must provide evidence of proficiency in the following:

- Business Math and Statistics
- Corporate Finance

Application Deadlines

Fall Admission: All required application materials are due by May 1.

Springs Admission: All required application materials are due by December 1.

International Applicants: Please be advised that there are additional university requirements that may take additional processing time - you are encouraged to apply prior to the application deadline if possible to ensure that if admitted, all required documentation can be provided prior to the term of entry.

Program Specific Degree Requirements

Master of Science in Finance

The program consists of a minimum of 30 semester hours of graduate coursework. Students must complete coursework in finance and elective business and/or non-business areas. Eighty percent of the student's total coursework must consist of 5000-level courses; the remaining 20 percent may be 4000-level non-finance courses (approximately six hours). Non-finance courses should be selected in consultation with the student's graduate advisor. Non-finance courses at the 4000-level may be taken during the senior year of undergraduate study and applied to the master's program, but they must be reserved for graduate credit and approved by the graduate program director, prior to the first day of such class.

General Finance Track

- FIN 5310: Investment Management (3)
- FIN 5530: Fixed Income (3)
- FIN 5400: Financial Modeling (3)
- 12 credit hours Finance electives + 9 credit hours graduate level business electives (6 credit hours can be 4000 level)

Online Only-CFP Track

- FIN 5310: Investment Management (3)
- FIN 5070: Tax Planning for Financial Planners (3)
- FIN 5720: Retirement/ Insurance Planning (3)
- FIN 5750: Intro to Wealth Management (3)
- FIN 5780: Estate Planning (3)
- FIN 5800: CFP Capstone (3)
- FIN 5400: Financial Modeling (3)
- FIN 5530: Fixed Income (3)
- Finance Electives (6 credit hours can be 4000 level)

Hybrid Online/Campus-CFP Track

- FIN 5310: Investment Management (3)
- FIN 5070: Tax Planning for Financial Planners (3)
- FIN 5720: Retirement/ Insurance Planning (3)
- FIN 5750: Intro to Wealth Management (3)
- FIN 5780: Estate Planning (3)
- FIN 5800: CFP Capstone (3)
- Graduate level business electives (12) (6 credit hours can be 4000 level)

A maximum of six hours may come from 4000-level courses offered in the College of Business or in other colleges at the University of Wyoming.

The student must complete the required coursework with a minimum GPA of 3.000 (on a 4.000 scale).

Student must maintain good academic standing at the program and university level and receive no letter grade of D or F. If a letter grade of D or F is received, student will be immediately dismissed from the program.

Any student falling below a cumulative GPA of 3.000 is automatically placed on probation for the following semester and must raise their GPA to 3.000 to avoid dismissal.

Students earning a grade lower than a C will be dismissed.

Finance (FIN)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◆Q]).

2010 [3010]. Personal Finance and Investments. 3. A general course treating the fundamentals and organization of the securities markets, types of orders, elementary market computations, basic investment management and etc. For students university-wide who have an interest in investments. (Offered based on sufficient demand and resources)

3100. Real Estate Development. 3. This course presents the basic principles involved in real estate development. Topics include: land acquisition and appraisal, site improvements, market feasibility analysis, development financing, real estate government approval and regulations, real estate engineering and construction issues, real estate marketing and property operations and performances. *Prerequisite:* ACCT 2010. (Offered based on sufficient demand and resources)

3250. Corporate Finance. 3. Deals with management of capital in a business firm. It treats policies and actions relating to asset structure, risk, income and cash flows. Operating and financial analysis is introduced. *Prerequisites:* ACCT 2010 and STAT 2010, 2050, or 2070 and sophomore standing.

3310 [4310]. Investment Management. 3. Fundamental principles of investments and practical implications of financial theory. Students acquire a framework for understanding returns on financial assets, risk and return, fundamentals of portfolio theory, efficient market hypothesis, and asset pricing models. Other topics include financial statement analysis, behavioral finance, and introduction to options and futures. *Prerequisites:* FIN 3250 and advanced business standing.

3520 [4520]. Financial Markets. 3. Portfolio and capital market theory and the analysis of risk are introduced. Integrates theory into practical aspects of financial markets. *Prerequisites:* FIN 3250, STAT 2010 or 2050/2070, and advanced business standing.

4070. Tax Planning for Financial Planners. 3. Focuses on principles, current law, and practice of income taxation and its impact on financial planning for individuals, couples, and families in their role as investors, employees, and business owners. Dual listed with FIN 5070. *Prerequisite:* advanced business standing.

4250. Advanced Corporate Finance. 3. Give students a better appreciation of the techniques and theories of corporate finance and investments that may have been introduced in introductory finance courses. *Prerequisites:* FIN 3250, 3310.

4340. Portfolio Management. I. 3. Manage, monitor and invest real money provided by the State of Wyoming and the University of Wyoming Foundation. Students should obtain from the course the ability to construct investment portfolios from scratch, to learn the signals from which to obtain sell and buy data and the ability to act on this information. *Prerequisites:* FIN 3310 and advanced business standing.

4350. Portfolio Management II. 3. Manage, monitor and invest real money provided by the State of Wyoming and the University of Wyoming Foundation. Students should obtain from the course the ability to construct investment portfolios from scratch, to learn the signals from which to obtain sell and buy data and the ability to act on this information. *Prerequisites:* FIN 3310 and advanced business standing.

4360. Options and Futures. 3. Provides an introduction to financial futures such as currency futures and interest rate futures. Explores the markets on which they are traded. Also analyzes pricing of options and other derivative securities. Includes the leverage and risk aspects of options. *Prerequisite:* FIN 3250, FIN 3310.

4400. Financial Modeling. 3. Involves the application of basic econometric methods to the analysis of financial data. Focus is on utilizing spreadsheets and other softwares to facilitate financial decision making. Dual listed with FIN 5400. *Prerequisites:* FIN 3250, FIN 3310, IMGT 1400, advanced business standing.

4410. Behavioral Finance. 3. Discusses popular and accepted theories of human behavior from the field of psychology to investigate features of irrational behavior in the financial markets. Topics covered include fundamental behavioral biases, behavioral asset pricing, investor behavior, and consequences of irrationality to financial markets at the aggregate level. *Prerequisites:* FIN 3250, FIN 3310.

4420. Capital Allocation. 3. A course designed to give students exposure to extensive analysis of problems in management of capital structure and capital expenditures. *Prerequisites:* FIN 3250, FIN 3310, STAT 2010 or equivalent and advanced business standing.

4460. Multinational Finance. 3. Deals with quantitative techniques used by financial managers and investors in global financial markets. Topics covered include exchange rate determination, management of foreign exchange exposure, international portfolio investment, and current topics in international finance. *Prerequisite:* FIN 3250, 3310.

4510. Bank Management. 3. Deals with financial decision-making in financial institutions, particularly emphasizing commercial banks. Topics covered include managing financial assets, deposit acquisition and capital management. *Prerequisites:* FIN 3250 and advanced business standing.

4530. Fixed Income Securities. 3. Provides an overview of the fixed income securities markets, pricing and risk management. In so doing, the course follows the CFA institute learning objectives of the CFA exam. We first introduce the major forms of fixed income

securities. We then delve into valuation of these securities using a myriad of pricing techniques. We then embark on credit risk analysis, followed by fixed income portfolio management. Ultimately, the course aims at preparing students for most challenging and yet active fixed income markets: corporate bonds and mortgage securities. Dual listed with FIN 5530. *Prerequisites:* FIN 3250, advanced business standing.

4540. Banking Policy. 3. Intended to be taken either with or after FIN 4510, Bank Management, and will cover similar topics but in greater depth and breadth. Integrated application of these topics will take place in a selection of case studies, some of which will be analyzed in teams. *Prerequisites:* FIN 4510 or concurrent enrollment in FIN 4510.

4560. Entrepreneurial Finance. 3. Expands business knowledge by focusing attention on accounting and finance concerns that are vital to new ventures. Focuses on issues that must be addressed to assist these businesses in meeting their objectives of growth, preparation for a public offering, and exit strategies. Cross listed with MGT 4560. *Prerequisites:* ACCT 2010, MGT 3210, FIN 3250.

4600. Ethics in Finance. 3. This course familiarizes students with the CFA Institute Standards on Professional Conduct and reinforces ethical behavior in the global investment management industry. Perspectives acquired in this course will be useful for students in their chosen finance professions as the content of the course provides a framework for ethical conduct in the investment profession by focusing on the CFA Institute Code of Ethics and Standards of Professional Conduct. Dual listed with FIN 5600. *Prerequisites:* FIN 3310, and FIN 3520 (or equivalent) with grades of C or better or graduate standing.

4710. Risk Management. 3. Analyzes the risk management and insurance problem in the business enterprise with emphasis on methodology for risk analysis; techniques for risk and loss control; and models for risk management decision-making. Dual listed with FIN 5710. *Prerequisites:* FIN 3250, FIN 3310, IMGT 1400 and advanced business standing.

4800. Real Estate Finance. 3. Exposes students to the fundamentals of real estate finance such as mortgage financing, commercial leases, pro-forma analysis, financial modeling, tax implications, leveraged real estate and valuation of income producing properties. While the theory of each topic will be presented, the focus is on the applications of the material. *Prerequisites:* FIN 3250 and advanced business standing.

4810. Real Estate Investment. 3. Covers advance real estate investment topics such as investments risk and valuation sensitivity analysis, futures and real options, liquid real estate investments, analysis of development projects, and commercial mortgage backed securities. While the theory the topics will be presented, the course focus is on the application of the material. *Prerequisites:* FIN 4800 and advanced business standing.

4900. Problems in Finance. 1-4 (Max. 4). Students register on an individual basis to study any phase of finance not included in organized courses. Written report required. *Prerequisites:* FIN 3250, IMGT 1400, advanced business standing, senior standing and written consent of instructor.

4910. Selected Topics in Finance. 3 (Max. 6 seniors and M.S.; Max. 9 Ph.D.). The material covered involves extensive in-depth investigations into topics which are specialty areas of the instructor in charge in any given term. *Prerequisites:* 9 hours in finance including FIN 3250, IMGT 1400 and advanced business standing.

5070. Tax Planning for Financial Planners. 3. Focuses on principles, current law, and practice of income taxation and its impact on financial planning for individuals, couples, and families in their role as investors, employees, and business owners. Dual listed with FIN 4070. *Prerequisite:* graduate standing.

5310. Advanced Investment Analysis. 3. The theory of investment management and security values, portfolio management including the analysis of investment policies and objectives, the analysis and use of investment information, and the development and application of the tools for determining values. *Prerequisite:* FIN 5510 and graduate standing.

5320. Corporate Finance and Governance. 3. Designed to provide a framework to analyze issues in corporate finance and governance. The firm is viewed as a nexus of contracts designed to reduce the costs of trade-and corporate finance is regarded as an investigation of the incomplete contracts that involve the providers of capital. *Prerequisites:* FIN 3250 (or equivalent); admission to the Master of finance, Graduate Program in Economics and Finance or Master of Accounting.

5400. Advanced Financial Modeling. 3. Involves the application of basic econometric methods to the analysis of financial data. Focus is on utilizing spreadsheets and other softwares to facilitate financial decision making. Dual listed with FIN 4400; cross listed with MBAM 5403. *Prerequisite:* graduate standing.

5510. Financial Management. 3. Studies of environmental influences on corporate financial decision making and measurement devices useful in corporate financial management. *Prerequisite:* MATH 2220, STAT 2020, ACCT 2020, COSC 1200 or equivalent; accepted in a graduate program.

5520. Seminar in Finance Theory. 3. Deals with the theory and application of security analysis and portfolio management. *Prerequisite:* FIN 5510 or equivalent; accepted in a graduate program.

5530. Fixed Income Securities. 3. Provides an overview of the fixed income securities markets, pricing and risk management. In so doing, the course follows the CFA institute learning objectives of the CFA exam. We first introduce the major forms of fixed income securities. We then delve into valuation of these securities using a myriad of pricing techniques. We then embark on credit risk analysis, followed by fixed income portfolio management. Ultimately, the course aims at preparing students for most challenging and yet active fixed income markets: corporate bonds and mortgage securities. Dual listed with FIN 4530. *Prerequisite:* graduate standing.

5600. Ethics in Finance. This course is designed to familiarize you with the CFP Board's Code of Ethics and Standards of Conduct and reinforce ethical behavior in the global wealth management industry. Ethical practices instill a public trust in the fairness of financial markets and transactions, allowing them to function efficiently. Ethical practices by finance and investment professionals benefit all market participants and stakeholders and lead to increased investor confidence in global capital markets. The perspectives acquired in this subject should be useful to students in their chosen finance profession as this subject presents a framework for ethical conduct in the investment profession by focusing on the CFP Board Code of Ethics and Standards of Conduct. Dual listed with FIN 4600. *Prerequisites:* admission to the graduate program; admission to the certificate program.

5710. Risk Management. 3. Analyzes the risk management and insurance problem in the business enterprise with emphasis on methodology for risk analysis; techniques for risk and loss control; and models for risk management decision-making. Dual listed with FIN 4710. *Prerequisite:* graduate standing.

5720. Insurance and Retirement Planning. 3. This class is designed to help graduate students understand various topics in retirement and insurance planning for individuals and families. *Prerequisite:* graduate standing.

5750. Introduction to Wealth Management. 3. This is a survey course for financial planning and wealth management. The topics include insurance planning, tax planning, investment planning, retirement planning, estate planning, and professional conduct. The course will focus on acquiring a framework for understanding the major components of financial planning and developing a coordinated financial plan. *Prerequisite:* FIN 3250; admission to the graduate program.

5780. Estate Planning. 3. This course will cover general reliability modeling and evaluation; probability and stochastic processes; system modeling; methods of reliability assessment (state space, frequency balancing, cut-set and tie-set analysis, decomposition, Monte Carlo simulation); and reliability modeling and analysis of electric power systems: bulk power systems, distribution systems, and industrial systems. *Prerequisite:* graduate standing.

5800. CFP Capstone. 3. This course will be organized around the four major areas of financial planning, as outlined by the College of Financial Planning curriculum. These four key areas are as follow: retirement planning; income tax planning; investment planning; and estate tax planning. *Prerequisite:* Admission to the MS program or permission of the Department Head.

5890. Advanced Problems in Finance. 1-9 (Max. 9). An arrangement whereby a student is permitted to develop an advanced phase of finance not offered in the formally structured courses or to investigate a finance problem, a written report is required. *Prerequisite:* 9 hours in finance and consent of instructor.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrolled in a graduate degree program.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

Department of Economics

260W Business Building, (307) 766-2175

Web site: www.uwyo.edu/economics

Department Chairman: David Aadland

Wyoming Excellence Chair in Conservation Economics:

H. JO ALBERS, B.S. Duke University 1985; M.E.S. Yale University 1987; Ph.D. University of California at Berkeley 1993; Professor of Economics 2014.

H.A. (Dave) True, Jr. Chair in Petroleum and Natural Gas Economics:

CHARLES F. MASON, A.B. University of California 1977; Ph.D. 1983; Professor of Economics 1994, 1982.

Stroock Chair of Natural Resource and Environmental Economics:

JASON F. SHOGREN, B.A. University of Minnesota-Duluth 1980; Ph.D. University of Wyoming 1986; Professor of Economics 1995.

Professors:

JOHN S. BUGAS, Professor of Economics
TODD CHERRY, B.S.B.A. Appalachian State University 1992; M.A. University of North Carolina Greensboro 1995; Ph.D. University of Wyoming, 1999. Graduate Director.
TIMOTHY J. CONSIDINE, B.A. Loyola University 1975; M.S. Purdue University 1977; Ph.D. Cornell University 1981; Professor of Economics 2008.

DAVID C. FINNOFF, B.S. University of Wyoming 1994; Ph.D. 2001; Professor of Economics 2018, 2004.

Associate Professors:

DAVID M. AADLAND, B.A. Augustana College 1991; M.S. University of Oregon 1996; Ph.D. 1997; Department Chairman, 2018; Associate Professor of Economics 2005, 2003.

ROBERT GODBY, B.S. Trent University 1990; M.A. University of Guelph 1992; Ph.D. McMaster University 1997; Center for Energy Economics and Public Policy Director, and Associate Professor of Economics 2003, 1997.

THORSTEN M. JANUS, B.A. University of Copenhagen 2000; M.A. University of California at Santa Cruz 2003; Ph.D. 2006; Associate Professor of Economics 2012.

ALEXANDRE SKIBA, Specialist Diploma Rivne State Technical University 1999; M.S. Purdue University 2001; Ph.D. 2003; Associate Professor of Economics 2019, 2012.

KLAAS T. VAN 'T VELD, B.Sc. University of London 1992; M.S. University of California-Berkeley 1993; Ph.D. 1997; Associate Professor of Economics 2010, 2004.

Assistant Professors:

BENJAMIN COOK, B.S. University of Wyoming 2003; Ph.D. 2011; Visiting Assistant Professor/Enhanced Oil Recovery Institute 2012.

FELIX NASCHOLD, B.S. University of London 1994; M.S. 1995; Ph.D. Cornell University 2008; Assistant Professor of Economics 2014.

STEPHEN NEWBOLD, B.S. University of California, Davis 1995; M.S. 2002; Ph.D. 2002; Assistant Professor of Economics 2018.

LINDA THUNSTROM, M.S. Umea University, Sweden 1999; Ph.D. Umea University Sweden 2008; Assistant Professor of Economics 2013.

Academic Professionals:

AMBER BROWN, B.S. Wellesley College 1984; M.A. University of Kansas 1993; Assistant Lecturer in Economics 2013.

WILLIAM CAMPBELL, B.S. University of Illinois 1981; M.S. Eastern Illinois University 2017; Student Advising Coordinator 2018.

Professors Emeriti:

Curtis A. Cramer, Thomas D. Crocker, William E. Morgan, Owen R. Phillips, Sherrill Shaffer, John T. Tschirhart

Business Economics Major

The science of efficient allocation, economics has much to offer students in the way of general and specialized preparation for positions in business, as well as government and the academic profession.

All Business Economics majors must comply with requirements of the advanced business standing prerequisites for enrollment in upper-division courses and must complete the common body of knowledge courses as listed previously.

In addition to university and college requirements cited previously, requirements for Business Economics majors include:

Economics Core	9
ECON 3010, 3020, 4240	
Economics Electives (4000)	6
Free Electives from any college.....	27
6 of 27 required hours must be at 3000-4000 level.	

A complete curriculum sheet is available from the Academic Advising unit of the GJSSC in Room 60 West of the College of Business Building.

Economics majors must hold a 2.500 cumulative grade point average in all economics courses at graduation, as well as a minimum 2.500 cumulative UW grade point average and a minimum 2.500 grade point average in all College of Business courses.

With approval of the department chair, students may substitute work in certain areas of accounting, agricultural economics, business administration, history, political science, finance, mathematics, statistics or law for 6 hours of 4000-level economics courses.

Students who intend to continue on to graduate work are urged to give special attention to courses in economics theory, statistics and mathematics. Those planning a career in econometrics or mathematical economics should consult the department head as to mathematics and statistics requirements in these fields of study.

Economics Undergraduate Major

The Economics major in the College of Business must complete 30 semester hours in economics courses.

All Economics majors must comply with course specific prerequisites for enrollment in upper-division courses and must complete all university studies courses as listed above previously. Students must earn a minimum grade of C (not C-) in all Economics courses.

In addition to university and college requirements cited previously, requirements for economics majors include:

Economics Core	27
ECON 1010, 1020, 3010, 3020, 4240, STAT 2010 or 2070 and one year of calculus sequence, Math 2200 and 2205, or 2350 and 2355.	
Economics Electives	15
4000-level	
Free Electives from any college.....	51
18 of 51 required hours must be 3000-4000-level.	

Quantitative Concentration

Required: Economics 4230 Intro. To

Econometrics	3
Free Economics 4000+ Electives	12
Stats 3050	3
Free Electives from any college (min. 15 cr. At 3000+)	48

**Total Hours Required in
Section II: Quantitative
Concentration 66**

OR**Policy Concentration**

Free Economics 4000+ Electives	15
Free Electives from any college (min. 18 cr. At 3000+)	31

**Total Hours Required
in Section II: Policy
Concentration 66**

**Total Hours Required For
Graduation 120**

This program is designed to meet the requirements of AACSB International (the Association to Advance Collegiate Schools of Business), the University of Wyoming, and the College of Business.

Minimum requirements include:

- Minimum of 42 semester hours of 3000+ level courses. 30 of the 42 hours must be earned from UW.
- 2.50 grade point average in all College of Business courses, Economics courses, and all institution (UW) courses.
- 50% of the business credit hours must be from the University of Wyoming.
- Grade of C (C- not acceptable) or above required for University Studies Program: FY, CI, C2, and C3.
- Grade of C (C- not acceptable) or above required for common body of knowledge and major specific core courses.
- A maximum of 6 hours at the 1/2000 level and 3/4000 level military science may be applied to degrees in the College of Business.

A complete curriculum sheet is available from the College of Business Peter M. & Paula Green Johnson Student Success Center in Room 60 West of the College of Business Building.

With approval of the department chair, students may substitute work in certain areas of accounting, agricultural economics, business administration, history, political science, finance, mathematics, statistics or law for 6 hours of the 4000-level economics electives.

This program allows considerable flexibility for the student to specialize in interdisciplinary study. For example, the student can be advised on selecting upper level division courses for pre-law study, political economy, environmental and natural resources, women's studies, and international studies.

Students who intend to continue in graduate work should give special attention to courses in economic theory, statistics and mathematics. Those planning a career in mathematical economics or econometrics should consult the department head regarding the mathematics and statistics requirements in these fields of study.

Graduate Work

The College of Business Department of Economics offers programs leading to the Master of Science degree, and to the Ph.D. degree.

Graduate Study

The Department of Economics offers programs leading to a master of science degree in economics and the doctor of philosophy degree in economics.

**Program Specific Admission
Requirements
Economics Program**

Admission to the economics program is granted to students who show high promise of success. Candidates of high promise generally have a cumulative grade point average of 3.000 or better (A=4.000) and score above 300 (for MS) and 310 (for PhD) combined on the verbal and quantitative sections of the GRE, with particular emphasis on strong quantitative and analytical scores. Such scores and grades do not guarantee admission.

The TOEFL is required for international students in accordance with University rules.

The Department of Economics requires that students have completed courses in intermediate micro and macro theory (ECON 3010, 3020 or equivalent), statistics, and 6 hours of introductory calculus (MATH 2200, 2205 or equivalent) for the MS program. A course in linear algebra (MATH 2050) is required for the PhD program.

**Program Specific Degree
Requirements****Master of Science in Economics**

A minimum of 18 hours in economics is required; at least 15 of these must be at the 5000 level. A basic core sequence of ECON 5010 (macro), 5390 (math micro), 5530 (computational), 5230 (econometrics), and 5300 (game theory) is required, which completes 15 hours of 5000-level courses, which is required.

The student must complete 26 hours of coursework and 4 hours of ECON 5960 Thesis Research for the Plan A option. The student must complete 30 hours of coursework and a shorter paper for the Plan B option.

Students may take 4000-level courses for graduate credit up to 6 hours.

A maximum of 6 semester hours of graduate coursework not used toward any other degree from another institution may be applied to the M.S. economics program subject to regulations regarding transfer of credit listed in this bulletin and with the approval of the director of graduate studies.

At the beginning of the third semester, the student selects a major professor who directs the Plan A or Plan B research. A graduate committee, nominated by the major professor, the student, and the department chair, conducts an oral examination of the student on the paper or thesis and area he/she has studied in the program. A favorable report by the committee and approval by the Office of the Registrar complete the degree requirements.

The majority of students complete the M.S. degree within two years.

QuickStart Master of Science in Economics

UW undergraduates can complete the M.S. degree in just one year after completing their B.S. degree if they apply to the QuickStart M.S. program in their junior year. To be eligible, students must have (and maintain) a cumulative GPA of 3.200 or better as well as an Economics GPA of 3.200 or better. They are also required to take the GRE by the fall of their senior year and score above 300 combined on the verbal and quantitative sections combined. Admission to the QuickStart program allows students to double-count 6 credits of courses taken as an undergraduate towards both the B.S. and M.S. degrees, and reserve an additional 6 credits of courses taken as an undergraduate towards the M.S. degree alone. This then leaves only 18 credits to be taken after completion of the B.S. degree, which is feasible in just one year.

Doctoral Program**Doctor of Philosophy in Economics**

The doctor of philosophy degree in the field of economics at the University of Wyoming requires a minimum of 42 hours of coursework. All coursework must be at the graduate (5000) level.

The program is designed to give the student a strong foundation in economic theory and the basic quantitative tools necessary for professional research. If students receive a grade lower than a B+ during their first year, they must take a comprehensive exam in that field (microeconomics and/or econometrics) during the summer to continue to the second year of the PhD program. The program's qualifying exam takes the form of a research paper written during the second summer and defended to, and approved by, a faculty committee by early in the third year, with revisions and resubmission required by December. Students who pass the qualifying paper requirement receive an MS degree and move on in the PhD program, while students who fail this requirement receive the MS degree and fail out of the PhD program.

During the third year, or no later than the first few weeks of the fourth year, a graduate committee nominated by the student's major professor and the director of graduate studies conducts an oral examination of the student. The purpose of the oral examination is to determine whether the student has formulated a workable dissertation project and has the necessary skills to complete it.

Following successful completion of the dissertation, and completion of a departmental requirement of 30 hours of dissertation research, the student presents an oral defense to the graduate committee. The doctor of philosophy degree is granted on recommendation of the committee and approval by the Office of the Registrar, providing all other requirements have been satisfactorily fulfilled.

Economics (ECON)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦♦Q]).

1000. Global Economic Issues. 3. [CS,G♦♦H] Economics: creating value through trade, enhancing society through ideas, and protecting the environment by design. This introductory course will help you understand better on how people use both free markets and government regulations to

create value, enhance society, and protect nature. You will explore how economic ideas and tools address big global issues like poverty and prosperity, inequality of wealth, capital and labor, sustainable development, free trade vs fair trade, climate change, war and peace, migration, brain drains, and science and nature.

1010. Principles of Macroeconomics. 3. [CS♦♦H] An introductory course on why economics matters. We examine why countries like the US are rich, while others are poor. We explore economic booms & busts, and policies to avoid them. We address GDP growth, unemployment and inflation, government debt, deficits, tax policy, and whether robots will take our jobs. Cross listed with AGECE 1010.

1020. Principles of Microeconomics. 3. [CS♦♦H] You make tradeoffs — your time and money are limited. Microeconomics evaluates how people think about tradeoffs and how we create value through markets, institutions, and policy. Economic incentives influence choices to consume and produce goods and services. Market failure creates a role for government to protect health, culture, and nature. Cross listed with AGECE 1020.

1101. First-Year Seminar. 3. [(none)♦♦FYS]

1200. Economics, Law and Government. 3. [V♦♦V] Markets and free enterprise depend on supportive legal and political institutions. The course exposes students to the U.S. political economy. Important relationships between market development, the legal framework and the political system are presented. The U.S. and Wyoming constitutions are studied to show their importance to free enterprise. Topics deal with public choice, cost-benefit analysis in policy, the importance of property rights and regulation.

1300. Oil: Business, Culture, and Power. 3. [CS,G♦♦(none)] A multi-disciplinary approach to understanding how oil affects the international relations and commerce. The relationships between oil technology, social and political institutions, the unique cultures in oil-producing regions will be investigated in case studies. Cross listed with ERS 1300.

1400. Sports Economics. 3. [CS♦♦H] Examines economic issues pertaining to professional and collegiate sports. Topics include: determinants of player salaries, owner profits and team values; effects of salary caps, revenue sharing, etc. on competitive balance; labor markets and discrimination; antitrust issues, and the impact of franchises on local economies.

2100. Introduction to Money and Banking. 3. An introduction to the entire area of money and public finance. Oriented towards students wishing to obtain a broad general understanding of importance of money and public finance

upon economic activity. Covers money and private financial institutions, monetary theory and policy, as well as public finance and fiscal policy. Credit will not be allowed for more than one of: ECON 2100 or FIN 3520. *Prerequisites:* ECON 1010, 1020.

2190. High Country Economics. 3 (Max. 3). Allows students to connect economic theory to tangible Wyoming and Rocky Mountain West issues. *Prerequisites:* ECON 1010 and ECON 1020, or written consent of instructor.

2400. Economics of the Environment. 3. [WB,G♦♦COM2] This introductory course examines the links between economics and the natural environment. We consider the efficient use of natural resources like minerals, forests, and fisheries. We also explore how to use economics to sharpen environmental policy for challenges like water and air pollution, climate change, and biodiversity protection. *Prerequisites:* ECON 1010 recommended, ECON 1020 required. (Offered based on sufficient demand and resources)

2500. The Impact of the Union Pacific on Wyoming History. 3. Students will experience and interpret the impact of the building of the Union Pacific Railroad on the history and culture of Wyoming through the lens of three disciplinary perspectives. Students will explore how the railroad impacted Wyoming geography, economic development and the people of the state through personal research projects. Cross listed with GEOG 2500 and HIST 2500.

2910. Topics in Economics. 3. A study of selected topics & problems in modern economics. Topics include but are not limited to sports economics, managerial economics, and behavioral economics.

3010 [2010, 4010]. Intermediate Macroeconomics. 3. A presentation and study of national income aggregates and accounting; equilibrium analysis of output, employment and the price level; general equilibrium analysis; and an introduction to economic dynamics. *Prerequisites:* ECON 1010 and 1020, QA and MATH 2200/2350 and sophomore standing.

3020 [2020, 4020]. Intermediate Microeconomics. 3. Key problems of environmental degradation and natural resource scarcity are identified. Main underlying causes of misuse and overuse are explained from an economics perspective. Policy options for improved management are presented. These economic concepts and tools are then applied to current real world environment and natural resource issues. *Prerequisite:* ECON 1010, ECON 1020, MATH 2200 or 2350 and sophomore standing.

3400. Energy Markets & Policy. 3. This course provides an economic analysis of recent developments in energy markets and policies. Cross listed with ERS 3400. *Prerequisite:* ECON 1000, ECON 1010, ECON 1020, ECON 1200, ECON 1300, ECON 1400, or ERS 1300.

3900. Economics Internship/Research. 1-3 (Max. 3). Students gain practical experience in economic applications and research. A contract with an Economics adviser and cooperating sponsor required before enrolling. Requires student paper and sponsor assessment. *Prerequisites:* ECON 1010 and ECON 1020, sophomore standing, or written consent of instructor.

4000. Conference. 1-4 (Max. 4). A tutorial-conference course intended to give economics majors an opportunity to engage in extensive research in some aspect of economics. Specific topics vary with students' needs and interests. *Prerequisites:* ECON 3010, 3020.

4030. Managerial Economics. 3. An advanced course on the theory of demand, production, cost, and supply; the theory of the firm, including market price under monopoly, monopolistic competition and oligopoly. Attention is given to the theory of factor prices and topics on welfare economics. *Prerequisite:* senior standing or above. Credit cannot be earned for this course and ECON 3020.

4115 [4110, 611]. Time Series Analysis and Forecasting. 3. Designed to have an applied orientation in a number of estimation procedures, such as exponential smoothing and forecasting with and without the presence of trends and seasonal repetitive patterns. The Box-Jenkins procedure will be covered in detail. Students become proficient in the application of statistical tools used in time series analysis of economic data. Cross listed with STAT 4115. *Prerequisites:* STAT 3050 or equivalent; STAT 4015/5015 recommended. (Offered based on sufficient demand and resources)

4230 [4340]. Intermediate Econometric Theory. 3. Covers simple and multiple regression models, problems of estimation, hypothesis and diagnostic testing, dummy variable, autoregressive and distributed lag models, and time-series analysis. The objective is to understand the underlying theory of econometric modeling and obtain operational ability to construct, estimate, and test econometric models. Dual listed with ECON 5230; cross listed with AGECE 4230. *Prerequisites:* ECON 3020, STAT 2050 or STAT 2070, and MATH 2350. (Normally offered spring semester)

4240. Evolution of Economic Ideas. 3. [WC♦COM3] Focuses on the most influential economists who have shaped the evolution of economic thinking throughout history. Emphasis is on tracing the evolution of economic

thought into the modern intellectual foundation of economics. Traces changing economic thought from mercantilism through modern paradigms. Restricted to Seniors in Economics, Business Economics, or a concurrent major with Economics. *Prerequisites:* Senior standing and ECON 3010 and 3020, or permission of instructor.

4350. Game Theory. 3. Discusses a variety of important concepts from game theory – the study of how individuals interact strategically. The course focuses on the development of students' ability to think strategically. To that end the course covers basic concepts in game theory; notions related to credibility; and notions related to forming and evaluating strategies. *Prerequisites:* ECON 3010 and 3020.

4360. Seminar in Economics. 1-3 (Max. 6). An analysis of selected problems of economics theory. Topics vary with student interest and with current stress in economics theory. *Prerequisites:* ECON 3010, 3020. (Offered based on sufficient demand and resources)

4390 [4320]. Mathematical Economics. 3. This course provides a broad set of practical tools that allow an analysis of important economic problems. The mathematical tools analyze human behavior and predict the response of economic systems to changes in circumstances and alternative policies, for applications such as investment project evaluation, capacity expansion, production decisions, or demand for various goods. Dual listed with ECON 5390. *Prerequisites:* ECON 3010, 3020, MATH 2205 or 2355.

4400. Environmental Economics. 3. The class explores how economics can help guide cost-effective environmental policy. We consider economic growth, the social costs of pollution (water and air), health risks, climate change, loss of biodiversity, and land development/conservation. We consider economic policies such as green taxes, cap-and-trade permit systems, and liability rules. We examine how to value environmental and ecosystem services in a market economy. *Prerequisites:* ECON 3020 and junior standing. (Offered based on sufficient demand and resources)

4410. Natural Resource Economics. 3. A study of the economics of the use and protection of renewable and nonrenewable resources. We focus on minerals, fossil fuels, fisheries, water, forestry resources, and ecosystem services. We explore optimal extraction and depletion, conservation, market structure, institutional design, and the role of time, space, and uncertainty. *Prerequisites:* ECON 3020 and junior standing. (Offered based on sufficient demand and resources)

4420. Seminar: Economics for ENR. 2-4. For students with little or no background in economics interested in economic perspectives on ENR. Emphasis is on integrated ecology-economics approach to investigate the economics environmental services, biological resources, and the ecosystems that contain them. CBEC and ECON majors cannot earn upper-division economics credit for this course. *Prerequisites:* successful completion of QB and senior standing.

4430. Energy Economics. 3. Economics of energy, particularly oil and gas. Includes a discussion of the history of the oil industry, as well as aspects of contemporary markets. Apply a variety of concepts from micro-economics, particularly related to industrial economics. *Prerequisites:* ECON 3020, MATH 2200 or 2350.

4450. Monetary Theory. 3. Topics in this course center on theories of the value of money and price levels; central banking theory and policy; international exchange; world monetary institutions. *Prerequisite:* ECON 3010, MATH 2200 or 2350. (Offered based on sufficient demand and resources)

4520. Public Economics. 3. Studies the role of government within a market economy. The focus is on how governments fund and provide non-market goods demanded by society, e.g., health care, military, education. Examines public goods, taxation, environmental challenges, affects on economic growth and stability, benefit-cost analysis, and state/local finance. *Prerequisites:* ECON 3010, 3020.

4530. Computational Economics. 3. An introduction to computational tools used to analyze economic data and policies. Provides operational knowledge of how to formulate numerical economic models to conduct analyses of consumer behavior, markets, trade, and state and local fiscal administration. Special emphasis on applications to Wyoming problems. Dual listed with ECON 5530. *Prerequisites:* ECON 3020, and one of STAT 2010, 2050, 2070, or 2110.

4700. Economic Development. 3. Encompasses the study of institutional and social, as well as economic, mechanisms for modernizing an economy while eliminating absolute poverty. Covers the economic concepts that help us explain why some countries are poor and how economic policies can assist those countries in becoming more developed. Case studies of specific country experiences are presented along with the economic theories in an integrated manner. *Prerequisite:* ECON 3010.

4710. Why Economies Succeed and Fail.

3. The study of the successes and failures of alternative economic systems; origins, similarities, and differences across capitalist, socialist, and communist systems, including the UW, Chinese, European, Russian, Latin American, and African economies. What does history teach us? Are there different tools to grow economy? Cross listed with INST 4710. *Prerequisites:* ECON 3010; QA. (Offered based on sufficient demand and resources)

4720. International Trade. 3. The gains from specialization and trade are studied, as are explanations of trade patterns among countries, policies affecting trade such as tariffs, quotas, tax breaks, subsidies, cartels and price stabilization plans. Topics on labor migration and multinational corporations are covered. *Prerequisites:* ECON 3020 and junior standing. (Normally offered fall semester)

4740. International Economics and Policy.

3. The focus is on foreign exchange markets, balance of payments analysis and effects of international trade and capital flows on the domestic economy. Policies to correct payment deficits, gold, international liquidity and international financial institutions are studied. *Prerequisites:* ECON 3010 and 3020; QA.

4800. Labor Economics. 3. The study of labor supply, labor demand, wage determination, resource allocation and income distribution. Emphasis is on public policy. *Prerequisites:* ECON 3010 and 3020; QA. (Offered based on sufficient demand and resources)

4820. Industrial Organization and Public Policy.

3. The conduct and performance of market structures is analyzed. Structures include perfect competition, monopolistic competition, oligopoly and monopoly. Special attention is given to the study of strategic behavior in industry. Game theory is introduced. Public policy against monopoly practices is reviewed. *Prerequisite:* ECON 3020 and QA/Q. (Offered based on sufficient demand and resources)

4840. Public Utility Economics. 3. The economic foundations of the public utility industries; the theory of public utility rate making; pricing and resource allocation; and the effectiveness of utility regulation. *Prerequisites:* ECON 1010 and 1020; QA. (Offered based on sufficient demand and resources)

4900. Problems in Economics. 1-4 (Max.

4). Students register as individuals or small groups to study any facet of economics not included in organized courses. Written report required. Limit 6 students per section. *Prerequisites:* ECON 3020 and senior standing, or written consent of instructor.

4910. Special Topics in Economics. 3 (Max.

6). Topics are extensive in-depth investigations in specialty areas of the instructor(s). Investigations are anticipated to be interdisciplinary and may be in cooperation with non-UW entities. Limit 6 students. *Prerequisites:* STAT 2050, ECON 3020, junior standing, or written consent of instructor.

5010. Advanced Macroeconomic Analysis.

3. An advanced application of economic theory to complex macroeconomics problems facing the economy of the state and nation, such as inflation, unemployment, and fiscal and monetary policies. *Prerequisite:* ECON 3010, 3020, or equivalent.

5020. Advanced Microeconomic Analysis.

3. A rigorous course in the analysis of demand and the theory of consumer behavior, supply and the theory of the firm, market equilibrium and stability, and income distribution. *Prerequisite:* ECON 3010, 3020, or equivalent.

5110. Advanced Topics in Economic Theory.

3. A study of selected topics in modern economic theory. Topics include growth theory, optimal control, dynamics, uncertainty, and game theory. *Prerequisites:* ECON 5010, 5020.

5115. Time Series Analysis and Forecasting.

3. An applied introduction to time series and forecasting. Brief coverage of time series regression, decomposition methods, and smoothing will lead into a more detailed coverage of Box-Jenkins (ARIMA) modeling. Computer analysis using MINITAB and SAS will be an important part of the course. Dual listed with ECON 4115; cross listed with STAT 5115. *Prerequisites:* STAT 3050 or equivalent, STAT 4015/5015 recommended.

5120. Advanced Analysis II-Microeconomics.

3. Part of a sequence with ECON 5020. It is advanced microeconomic analysis covering general equilibrium and welfare economics, and advanced topics in consumption and production theory. *Prerequisites:* ECON 5010, 5020.

5130. Dynamic Optimization. 3.

Covers methods for obtaining the optimal choice for economic variables that change over time, including calculus of variations and optimal control. These methods are applied to various dynamic economic problems, including optimal resource extraction, optimal capital allocation, and optimal growth. *Prerequisites:* ECON 5020, 5370.

5230. Intermediate Econometric Theory. 3.

Covers simple and multiple regression models, problems of estimation, hypothesis and diagnostic testing, dummy variable, autoregressive and distributed lag models, and time-series analysis. The objective is to understand the underlying theory of econometric modeling

and obtain operational ability to construct, estimate, and test econometric models. Dual listed with ECON 4230; cross listed with AGECE 5230. *Prerequisite:* admission to the Master's Program in Economics.

5300. Game Theory. 3.

Discusses a variety of important concepts in the application of game theory to modern microeconomics, including Nash equilibrium, subgame perfect equilibrium, and Bayesian Nash equilibrium. Time permitting, the class will also explore some relatively new uses of game theory, including evolutionary games and differential games. *Prerequisites:* admission to the graduate program in Economics and Finance.

5310. Research Methods. 3.

A variety of topics of importance to the advanced student who is preparing to write his or her dissertation are discussed. *Prerequisite:* admission to the graduate program in Economics and Finance.

5330. Advanced Mathematical Economics.

3. Study of the principal mathematic techniques used in economic theory and modeling. Taught jointly with ECON 5020. *Prerequisite:* graduate standing.

5340. Applied Econometrics. 3.

Presents a thorough coverage of the general and normal linear regression models. Then proceeds to deal with the standard methodologies for estimating variations of this model including autocorrelation and heteroskedasticity, extreme multicollinearity, disturbance-related sets of regression equations, simultaneous equation bias, and simultaneous equation models. *Prerequisites:* ECON 3010, 3020 and STAT 2010.

5350. Advanced Econometrics Theory I. 3.

Review topics in probability theory and mathematical statistics. Also provides an introduction to the classical linear regression model, estimation, hypothesis testing, and prediction. *Prerequisites:* Calculus and Basic Statistics.

5360. Advanced Econometrics Theory II. 3.

Continue the analysis in ECON 5350 and cover topics such as panel data, limited-dependent variables, simultaneous systems, nonlinear models, Bayesian analysis, and time series methods. *Prerequisites:* ECON 5350.

5370. Advanced Econometric Theory III. 1

- 3 (Max 9). More in-depth coverage of topics in ECON 5350 and 5360. Topics are selected based on current advancements in econometrics and students' research interests and may include generalized method of moments (GMM), nonparametric estimation, state-space models and the Kalman filter, mixed and nested logit models, multinomial discrete-choice models, and simulated maximum likelihood. *Prerequisite:* ECON 5360.

5380 [5320]. Experimental Methods in Economics. 3. Accepted experimental techniques in behavioral economics are studied. Critical review of previous experimental work is used to learn proper procedure. The value of subject control and creative construction is stressed. *Prerequisite:* graduate standing.

5390. Math Microeconomics. 3. This course provides a broad set of practical tools that allow an analysis of important economic problems. The mathematical tools analyze human behavior and predict the response of economic systems to changes in circumstances and alternative policies, for applications such as investment project evaluation, capacity expansion, production decisions, or demand for various goods. Dual listed with ECON 4390. *Prerequisites:* ECON 3010, 3020, MATH 2205 or 2355.

5400. Advanced Resource and Environmental Economics. 3. This course examines how we use economics to sharpen natural resource use and environmental policy. We focus on the behavioral and institutional underpinnings of market success and failures, choice under risk, time, space, conflict, cooperation, incentive design, non-market valuation, and prosperity. *Prerequisite:* ECON 3020, 4400 or consent of instructor.

5410. Seminar in Advanced Resource and Environmental Economics. 1-3 (Max. 6). This course explores the modern theory and empirics in environmental and natural resource economics. We focus on cost-benefit analysis, land use, energy, biodiversity protection, climate change, forestry, ecosystem services, fisheries, water, and sustainable development. *Prerequisites:* ECON 4400 and ECON 5020.

5520. Advanced Public Economics. 3. This course examines when and what policies maximize welfare, and their distributional impact. It addresses market failures and behavioral biases as potential justifications for government intervention. It also addresses preferences for redistributions, benefit-cost analysis, the economics of taxation, information and nudges. *Prerequisite:* ECON 5010, 5020 or equivalent.

5530. Computational Economics. 3. An introduction to computational tools used to analyze economic data and policies. Provides operational knowledge of how to formulate numerical economic models to conduct analyses of consumer behavior, markets, trade, and state and local fiscal administration. Special emphasis on applications to Wyoming problems. Dual listed with ECON 4530. *Prerequisite:* admission to the Master's program in Economics.

5640. Financial Economics I. 3. Focuses on theoretical topics. Covers optimal portfolio selection under uncertainty and differential information as well as fundamental theoretical issues in banking and financial intermediation. In the latter part of the semester, students have an opportunity to present one of the assigned articles in class and lead a discussion on it, with active participation by the entire class. *Prerequisites:* PhD-level microeconomics class (5020) and at least one 4000-level finance class.

5650. Financial Economics II. 1-3 (Max. 6). Topics include corporate finance, capital structure and the theoretical valuation of financial securities; also, asset pricing and financial econometrics. *Prerequisite:* ECON 5640.

5700. Advanced Economic Development. 3. Explores basic growth theory, "economic history" models of economic expansion, theories of natural resource based development and trade-resource models, the role of institutions and public policy in influencing development, and the effects of population, trade and finance on development. *Prerequisites:* ECON 5010, 5020.

5720. Advanced International Economics. 3. Studies the economics of trade between nations. Important trade theories are studied along with their empirical evaluation. Time is devoted to the importance of international trade growth. Government trade policies are given theoretical and empirical evaluation. *Prerequisite:* ECON 5020.

5730. Advanced Regional Analysis. 3. An advanced study of regional economic models. Included are structural and simulation models, regional growth models, and income estimation models. Emphasis is placed on quantitative analysis of regional growth and development. *Prerequisite:* ECON 3010, 3020 and 4600 or equivalents.

5820. Advanced Industrial Organization and Public Policy. 3. An application of market and price theory to concentration, size, competition; antitrust; close-knit and loose-knit combinations; business practices; price leadership and discrimination; delivered pricing; fair trade; unfair competition; and public policy. *Prerequisite:* ECON 5010, 5020, or equivalent.

5830. Empirical Industrial Organization. 3. Focuses on methods of analyzing data and testing hypotheses arising in the field of industrial organization. Much of the material builds on concepts introduced in ECON 5020 along with concepts presented in econometrics classes. Although many of the relevant concepts are primarily covered in ECON 5820, this course

can be taken before or without taking ECON 5820. *Prerequisite:* admission to the graduate program in Economics and Finance.

5890. Seminar in Advanced Economics. 1-3 (Max. 9). An advanced tutorial-conference course intended to give graduate students experience in research in economic problems. *Prerequisite:* consent of instructor.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrolled in a graduate degree program.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

Department of Management and Marketing

College of Business 354, (307) 766-3124

FAX: (307) 766-3488

Web site: business.uwyo.edu/mgmtmkt

Department Chairman: Ronn Smith

Professors:

MARK LEACH, B.S. University of Arizona 1991; Ph.D. Georgia State University 1998; Professor of Marketing 2016.

RICHARD C. MCGINITY, A.B. Princeton University 1966; M.B.A. Harvard Business School 1973; D.B.A. 1980; Bill Daniels Chair of Business Ethics 2007; Professor of Management and Marketing 2009.

C. MARK PETERSON, B.A. University of Virginia 1978; M.S. Georgia Institute of Technology 1989; Ph.D. 1994; Professor of Marketing 2014, 2007.

LINDA PRICE, B.A. University of Wyoming; M.B.A. University of Wyoming; Ph.D. University of Texas Austin; Professor of Marketing 2020.

ROBERT D. SPRAGUE, B.S.B.A. University of Denver 1980; J.D. 1985; M.B.A. University of Southern California 1999; Professor of Legal Studies in Business 2016, 2004.

Associate Professors:

ANDREW ARNETTE, B.S. Virginia Polytechnic Institute & State University 2000; M.B.A. Virginia Polytechnic Institute & State University 2002; Ph.D. Virginia Polytechnic Institute & State University 2010; Associate Professor of Decision Science 2018, 2012.

PATRICK M. KREISER, B.A. John Carroll University 1997; M.B.A. University of Alabama 1999; Ph.D. 2004; Associate Professor of Management and Rile Chair of Entrepreneurship and Leadership 2018.

GRANT L. LINDSTROM, B.S. Utah State University 1981; M.B.A. University of Utah 1986; Ph.D. 1989; Associate Professor of Management 1996, 1990.

ELIZABETH A. MINTON, B.S. University of Alaska Southeast 2008; M.B.A. Idaho State University 2010; Ph.D. University of Oregon 2014; Associate Professor of Marketing 2018, 2014.

STEPHANIE A. ONETO, B.S. University of Nebraska-Lincoln 1999; M.A. University of Houston 2001; Ph.D. 2007; Associate Professor of Marketing 2014, 2007.

RONN J. SMITH, B.S. Montana State University 1999; M.A. Montana State University 2000; Ph.D. Washington State University 2004; Associate Professor of Marketing 2020.

CHASE THIEL, B.S. Idaho State University 2009; M.S. University of Oklahoma 2009; Ph.D. 2012; Associate Professor of Management 2019, 2016.

Assistant Professors:

MOLLY R. BURCHETT, B.A. Transylvania University 2009; M.A. University of Kentucky 2014; Ph.D. University of Kentucky 2020.

MATTHEW FOX, B.A. Colorado College 2000; M.B.A. University of Nevada 2007; Ph.D. Duke University 2015; Assistant Professor of Entrepreneurship 2018.

SHAWN T. MCCLEAN, B.A. Washington State University 2012; M.B.A. Washington State University 2014; Ph.D. Texas A&M 2020.

NICHOLAS PRINCE, B.S. Kansas State University 2004; M.B.A. Brigham Young University 2009; Ph.D. University of Illinois Urbana-Champaign 2015; Assistant Professor of Management 2016.

Academic Professionals:

R. CLIFFORD ASAY, B.S. Brigham Young University 1991; M.B.A. Portland State University 1998; Senior Lecturer 2011, 2006.

COREY A. BILLINGTON, B.S. Stanford University 1981; M.S. 1981; Ph.D. 1987; Visiting Professor in Entrepreneurship and Innovation 2015.

CASEY FROME, B.S. University of Wyoming 2009; M.P.A. 2014; J.D. 2014; Assistant Lecturer 2018.

ERIC J. KRSZJZANIEK, B.A. University of Wisconsin-Stevens Point 2005; M.A. University of Wyoming 2014; Ph.D. 2018; Assistant Lecturer 2018.

GREG C. LIVINGSTON, B.A. University of Wyoming 1996; M.A. 2018; Assistant Lecturer 2018.

KENT NOBLE, B.S. University of Wyoming 1982; Bill Daniels Distinguished Professor of Business Ethics 2016.

Professors Emeriti:

Robert E. Allen, John H. Jackson, Anthony F. McGann, J. Brooks Mitchell, Terri L. Rittenburg, Robert G. Roe, Samuel G. Taylor, Philip E. Varca, Larry R. Weatherford

The Department of Management and Marketing offers programs of study leading to the Bachelor of Science in Business degrees in (1) Management of Human Resources, (2) Marketing, (3) Entrepreneurship, (4) Professional Sales, (5) Business Administration (online only starting Fall 2015). The departmental requirements for each of these degree programs are listed below.

All majors in the Department of Management and Marketing must meet requirements of the advanced business prerequisite for enrollment in upper-division courses, must complete the common body of knowledge courses as listed previously and require a minimum grade of C for courses in their major and MGT 4800.

Students outside the business major may take business courses, and are not held to advanced business standing requirements, but they should first check with the Academic Advising unit of the GJSSC to see if they meet other prerequisites. They oversee the formal petition process that provides non-majors permission to take business courses, and COB/AAC should be the next step in getting permission after getting consent of the instructor.

Business and accounting 3000- and 4000-level courses are reserved for those with junior or senior level standing whether majors or non-majors unless otherwise noted.

Graduate Study

The Department of Management and Marketing staffs most of the MBA classes (on-campus and eMBA) although the degree is a college-wide degree. Further, the department offers a Ph.D. in Marketing with an emphasis in Sustainable Business Practices. Some 4000- and 5000-level classes may be counted as graduate classes in other programs.

Business Administration

Business Administration major only available online starting Fall 2015. Students who elect to major in the business administration curriculum acquire a comprehensive understanding of business as a whole. Through exposure to all functional areas in business, students will develop broad skills and knowledge. The business administration degree prepares students for a wide variety of career opportunities in business and government.

The Online BSAD degree is a completion-program designed to be enrolled in after you have successfully completed general education and prerequisite business coursework for the first two years of this degree elsewhere. The program allows you to complete the last two years of the degree online at the University of Wyoming. Therefore, the BSAD online degree requires students to have completed Advanced Business Standing (ABS) prerequisite coursework, which can be taken from an accredited Wyoming community college or other university, before completing upper division coursework from the University of Wyoming.

All business administration majors must comply with requirements of the advanced business prerequisites for enrollment in upper-division courses and must complete the common body of knowledge courses as listed previously. All business administration courses for the major require a minimum grade of C (not C-).

In addition to university and college requirements cited previously, requirements for business administration majors include:

Business Administration Core	21
ACCT 3240, FIN 3520, DSCI 4240, MGT 3110, 3410, 4340, MKT 4430	
Restricted Electives	6
3000-4000-level business	
Free Electives from any college.....	24

A complete curriculum sheet is available from the Academic Advising unit of the GJSSC in Room 60 West of the College of Business Building.

Decision Sciences

The decision sciences curriculum is designed to serve students with a variety of majors. A minor in decision sciences is available for students wishing to augment their major with quantitative and computer-based decision-making tools. Decision sciences courses emphasize applications to supply chain operations management.

Decision Sciences (DSCI)

3210 [OM 3210]. Introduction to Operations and Supply Chain Management. 3. An introductory course in production and operations management. Typical topics include operations strategy, quality management, facilities location, facilities layout, forecasting, inventory management, production planning, scheduling and project management. *Prerequisites:* IMGT 1400 or equivalent, STAT 2050 or equivalent, MATH 2355 or equivalent, sophomore standing. (EN majors: MATH 2205 and sophomore class standing.)

4230. Purchasing and Supply Management. 3. Examines how to manage supply function. Topics include organization, planning procedures, category management, supplier selection, quality, inventory decisions, ethical and profession standards, costing, and price determination. *Prerequisites:* DSCI 3210, junior standing, advanced business standing.

4240. Computer Applications in Decision Sciences. 3. A study of decision science topics such as mathematical programming, Monte Carlo simulation, forecasting, project management and decision theory. The applications of computer techniques is emphasized. *Prerequisites:* IMGT 1400 or equivalent, STAT 2010 or equivalent, and junior class standing.

4250. Revenue Management. 3. Examines the tools used by many industries in the service sector to maximize revenue, including forecasting demand, overbooking customers, group decision making, how to allocate fixed assets, and control of the overall network. *Prerequisites:* DSCI 3210, advanced business standing, junior class standing.

4260. Project Management. 3. Examines the coordination project management activities. This includes the initiation, planning, implementation, control and evaluation of projects. *Prerequisites:* ACCT 2010, MATH 2350 and

STAT 2050 or equivalents in each, grade of C or better in each, junior class standing (EN majors: MATH 2200, ES 1060 or equivalent, junior class standing).

4270. Logistics. 3. Presents a synthesis of the principles in logistics activities resident in the supply chain. The course emphasizes how to manage the operation and integration of transportation (inbound and outbound), inventory, warehousing, facility location, customer service, packaging and materials handling. *Prerequisites:* DSCI 3210, junior standing, advanced business standing.

4280. Supply Chain Management. 3. Examines the coordination of material flows and information through networks of suppliers, producers, warehouses, and customers that are linked by transportation modes. *Prerequisites:* DSCI 3210, junior standing, advanced business standing.

4900 [OM 4900]. Problems in Decision Sciences. 1-4 (Max. 4). Studies, on an individual basis, any decision science topic not included in currently offered courses. *Prerequisites:* DSCI 3210, advanced business standing, senior standing and written consent of instructor.

5890. Advanced Problems in Decision Science. 1-8 (Max. 8). An arrangement whereby a student is permitted to develop some advanced phase of decision sciences not offered in the formally structured courses or to investigate a particular decision sciences problem. A written report is required. *Prerequisite:* consent of instructor and acceptance into a graduate program.

Entrepreneurship major

Entrepreneurship Core..... 12
(ENTR 2700, ENTR 3700, ENTR 4700, ENTR 4750)

ENTR Elective.....3
(MKT 4590, MGT 3110, ENTR 4910)

Advanced Business Electives {3000+} ...6
Free electives from any college..... 27

Entrepreneurship (ENTR)

2700. Entrepreneurial Mindset. 3. This course introduces students to entrepreneurial mindsets and concepts essential to success in startups or within established firms. Provides a basic overview of creativity and innovation, and students experience the process of identifying and evaluating ideas and developing them into business opportunities. *Prerequisites:* COM1, sophomore standing.

3020. Comparison of Entrepreneurial Ecosystems. 3. The goal of this course is to expose students to different entrepreneurial ecosystems and let them think about how the environment, legal, technical, cultural, and economic, could impact their entrepreneurial endeavors. The class will accomplish this by visiting a developed country and a developing country to learn about the ecosystems and talk with entrepreneurs to see how the forces impacted their startups. Cross listed with ES 3020.

3700. Innovation, Ideation, and Value Proposition. 3. This course explores opportunity recognition, innovation, and building value propositions based on customer discovery through interviews, surveys, and other methods. Students learn to develop a lean start-up and build customer focused value propositions. The focus is on rapid hypothesis testing and developing minimum viable products. *Prerequisite:* ENTR 2700.

4700. Business Model Creation and Launch. 3. Students build on previous learning to develop a complete business model including sales and marketing strategies, operations, financial forecasts, and partners. Deliverables include a pitch to start-up investors as part of a real-world entrepreneurship experience (for example, an entrepreneurship competition). Students learn primarily through hands-on application of concepts. *Prerequisite:* ENTR 3700.

4750. Theories of Entrepreneurship. 3. A broad examination of historical, literary, and business perspectives on entrepreneurship. Students explore the role of individuals, new ventures, and established organizations in the discovery, evaluation, and exploitation of opportunities. Emphasis is on the evolution of entrepreneurship theories over time, and current trends related to the application of these theories. *Prerequisite:* ENTR 3700.

International Business

The international business curriculum is designed to serve students with a variety of majors. A cross-disciplinary minor in international business is offered to students who want to augment their majors with learning about global management, finance, economics, accounting and/or a study abroad experience.

A curriculum sheet with the international business minor requirements is available from the College of Business Peter M. & Paula Green Johnson Student Success Center in the College of Business building.

International Business

(INBU)

1040 [BUSN 2000]. Introduction to International Business. 3. A broad survey of the field of international business which introduces basic concepts of international business activity and theory and reviews major foreign environmental forces--financial, economic and socioeconomic, physical, sociocultural, political, legal, labor, competitive and distributive--within the context of strategic management issues. Cross listed with INST 1040.

3110. Global Business Ethics. 3. This course will provide students with fundamental grounding in business ethics and corporate social responsibility, including recent developments related to universal principles for ethical business practice. Students will gain tools for ethical decision making in the global context to maintain sustainable businesses for the 21st century. *Prerequisite:* sophomore standing.

4570 [BADM 4540; BUSN 4540]. Global Business Issues. 1-6 (Max. 6). Designed to give students a broad overview of current issues in international business. Includes classroom instruction and may include travel to a foreign country and visits to major foreign firms. A written assignment is required. Dual listed with INBU 5570. *Prerequisite:* consent of instructor.

4900 [BUSN 4900]. Problems in International Business. 1-4 (Max. 4). Individual projects of a research nature, under direct supervision of a professor. Written report required. *Prerequisite:* consent of instructor.

4910 [BUSN 4910]. Selected Topics in International Business. 3. For advanced students; consists of an in-depth study of a selected area of international business. Specific area(s) to be considered in any given semester are printed in the class schedule. Topics may include globalization and business, international accounting, international management and negotiation, or topics related to doing business in a particular country or region. *Prerequisites:* junior standing and other courses, as appropriate, for specific area/topic being covered.

4920 [BUSN 4920]. International Business: Study Abroad. 1-6 (Max. 6). Credit for course work related to international business undertaken at foreign institutions. Students are responsible for submitting course materials for evaluation for credit by College of Business faculty prior to enrolling. Students arrange for the foreign institutions to send performance evaluations to the Peter M & Paula Green Johnson Student Success Center. *Prerequisite:* consent of department head.

5570 [BADM 4540; BUSN 5540]. Global Business Issues. 1-6 (Max. 6). Designed to give students a broad overview of current issues in international business. Includes classroom instruction and may include travel to a foreign country and visits to major foreign firms. A written assignment is required. Dual listed with INBU 4570. *Prerequisite:* consent of instructor.

Management of Human Resources

The Management of Human Resources major is an experiential program designed to help students learn how to develop and manage the human capital of an organization. More organizations are moving toward an understanding that employees are a resource that can be developed into a distinct competitive advantage to ensure organizational success, sustainability, and reputation. Students will be prepared to create policies and practices for effective recruitment, socialization, training, development, compensation, performance management, career planning, and employee relations. Moreover, this major will help employees understand the core purposes of the area of human resource management, which are: (1) recognize the potential of individuals for and within an organization and (2) structure a positive, supportive, constructive work environment that will enable employees to work at their optimal capacity and achieve organizational goals. Students in this major will be prepared to work in a variety of human resource capacities and in other key positions related to employee management, and will understand principles for facilitating others success.

All management of Human Resources majors must comply with requirements of the advanced business prerequisites for enrollment in upper-division courses and must complete the common body of knowledge courses as listed previously. All management courses for the major require a minimum grade of C (not C-).

Management of Human Resources Requirements

In addition to university and college requirements cited previously, requirements for majors in Management of Human Resources include the following (21 credit hours.)

Management of Human Resources Requirement	
MGT 3410.....	3
MGT 3420.....	3

MGT 4220.....	3
MGT 4240.....	3
HR Approved Elective (3000-level or higher)*.....	3

Advanced Business Electives

Any Business Course (3000-level or higher)*.....	3
Any Business Course (3000-level or higher)*.....	3

Major Total Credits 21

*Approved Electives for the Management of Human Resources Major: MGT 4430; MGT 4260; MGT 4910.

A complete curriculum sheet is available from the College of Business Peter M. & Paula Green Johnson Student Success Center in Room 60 West of the College of Business Building.

Management (MGT)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

1040 [2010, BADM 1040]. Legal Environment of Business. 3. Provides a broad overview of business-related legal topics. Students are familiarized with courts and alternative dispute resolution, constitutional law, torts, contracts, intellectual law, criminal law, and cyber law.

2600 [BADM 2600]. Internship in Business. 1-4. Provides students with practical business knowledge and a perceptual basis for later coursework. Students work as interns in operating organizations. *Prerequisite:* Approved internship application through the Peter M. & Paula Green Johnson Student Success Center and a minimum GPA of 2.5.

3110 [BADM 3210]. Business Ethics. 3. Studies the cognitive, social, behavioral, and corporate processes affecting individual, group, and organizational judgments in morally questionable situations. Through analysis students understand what factors give rise to and influence ethical issues and how organization values precipitate ethical behavior among employees. *Prerequisites:* sophomore standing.

3210. Management and Organization. 3. An introduction to the theory and practice of management with emphasis on individual and small group behavior, design and structure of organizations, relationship between the organization and its environment and statistical and quantitative skills used in examination of management processes. Also covers interpersonal communications, ethics and international management. *Prerequisite:* sophomore standing and completion of COM1.

3410 [4410]. Human Resources Management. 3. A study of the formal systems used to manage people at work. Emphasis is on concepts and procedures of EEO, diversity, job analysis, job evaluation, wage and salary administration, performance evaluation, safety, employee services and fringe benefits. *Prerequisites:* MGT 3210 and advanced business standing.

3420 [4420]. Organizational Behavior and Leadership. 3. An interdisciplinary study of individual, group, and organizational processes that affect employee behavior at work. Prepares students for various managerial roles by synthesizing successful leadership practices in both domestic and international settings and by examining critical areas such as individual differences, organizational politics and culture. *Prerequisites:* MGT 3210 and advanced business standing.

3460. International Management. 3. This course examines the environmental, cultural, political, legal, and operational challenges facing managers in doing business across international borders. *Prerequisites:* INBU 1040 or junior standing.

4220. Talent Acquisition. 3. In Human Resource Management one core function is recruiting and selecting the best talent to drive organizational success. Students will learn how to analyze jobs and develop recruitment plans to find qualified individuals, how to conduct professional and valid interviews, and how to successfully onboard employees into the organization. *Prerequisites:* MGT 3410 and junior class standing.

4240. Performance and Compensation. 3. In Human Resource Management the management of employee performance and compensation are key functions that drive organizational success. This course helps students become familiar with total compensation systems, including intrinsic and extrinsic rewards, base and variable pay, and benefits, and their relationship with employee performance and satisfaction. *Prerequisite:* MGT 3410 and junior class standing.

4260. Training and Development. 3. In Human Resource Management training employees in the latest technical and managerial skills and helping them gain developmental experiences helps drive organizational success. Students will learn how to recognize training and developmental needs, how to develop employee training systems, and how to implement these training systems. Additionally, students will learn about career and leader development. *Prerequisite:* MGT 3410 and junior class standing.

4340 [BADM 4340]. Law for Managers. 3. Provides an overview of laws and legal issues associated with managing a business, incorporating aspects of sustainable business practices. Topics include agency and employment, business organizations, including securities laws and corporate governance standards, government regulation of businesses, including environmental/sustainability regulations, and an introduction to international law and global economy. *Prerequisite:* MGT 1040 or equivalent and junior class standing.

4350 [BADM 4350]. Commercial Law. 3. A study of the basic principles of commercial law, including property, sales, negotiable instruments, secured transactions, creditors' rights and bankruptcy. *Prerequisites:* MGT 1040 or equivalent and junior class standing.

4360. Business Law for Entrepreneurs. 3. A survey of the various legal issues confronted by entrepreneurs, particularly related to new ventures. *Prerequisite:* MGT 1040 and junior class standing.

4370. Employment Law. 3. Provides a comprehensive foundation for understanding the law as it relates to the employer-employee relationship. This course will provide students the legal background necessary to make better decisions both as a worker as well as a manager of other. *Prerequisites:* MGT 1040 or equivalent, junior standing.

4430. Organization Design and Change. 3. Examines organizations, what they are, how they operate and are structured and how they can be changed. Focus is on macro managerial issues in the design and change of work organizations. *Prerequisites:* MGT 3210, MGT 3410, MGT 3420; advanced business standing.

4455. Systems Analysis and Design. 3. Concerned with the analysis, management, and conceptual design of information systems. Specific topics include systems planning, requirements analysis, business process modeling and redesign, flexibility analysis, alternative analysis, and architectural selection and design focused on supporting an organization's business requirements through various system design methodologies. Cross listed with IMGT 4455. *Prerequisite:* IMGT 1400, ABS and junior class standing.

4470. Negotiations and Conflict Resolution. 3. [(none)◀▶] Focuses on all aspects of formal managerial negotiation including dealings with suppliers, buyers, unions and etc. Also examined are the theory and practice of interpersonal negotiation. Conflict resolution is approached by identifying types and sources of conflict, organizational parameters of conflict,

as well as resolution skills and behavior. *Prerequisites:* MGT 3210, MGT 3410, MGT 3420; advanced business standing.

4500 [BADM 4500]. Employee to Entrepreneur. 3. Investigates considerations relating to leaving current employment, ethical dilemmas, skills needed to launch a new business, importance of cash flow and financing start-up, personal rewards and costs of entrepreneurship, and an overview of business plan context. *Prerequisite:* Sophomore standing.

4510 [BADM 4510]. New Entrepreneurial Venture. 3. Focus is on creating a successful business concept and determining its feasibility in the context of a rapidly changing global business environment. Students research, analyze and present a new business concept, which may evolve into a comprehensive business plan. *Prerequisites:* MGT 3210, ACCT 2010, junior standing.

4550. Family Business and Corporate Venturing. 3. Investigates the organizational life cycle using a dual focus of family business and new ventures within established organizations. Topics include start-up considerations, organizational form, cash flow and financing, family dynamics, and identifying appropriate ventures for enhanced organizational growth. Ownership succession and exit strategies are also discussed. *Prerequisites:* advanced business standing and junior standing.

4560. Entrepreneurial Accounting and Finance. 3. Expand business knowledge by focusing attention on accounting and finance concerns that are vital to new ventures. Focuses on issues that must be addressed to assist these businesses in meeting their objectives of growth, preparation for a public offering, and exit strategies. *Prerequisites:* ACCT 2010, FIN 3250, MGT 3210.

4600. Advanced Internship in Business. 1-4. Provides students with practical business knowledge, policy, procedure, and decision making. Students work as interns in operating organizations. *Prerequisites:* MKT 3210, MGT 3210, FIN 3250, Advanced Business standing, approved internship through the Peter M. & Paula Green Johnson Student Success Center.

4800. Business Strategy and Policy. 3. [(none)◀▶COM3] A capstone course designed to integrate prior courses into a general manager's overall organization perspective. Coverage will emphasize strategic management models which provide frameworks that assist in this task and integrate those internal organization factors with the firm's environment. *Prerequisites:* ACCT 2010, 2020, MGT 1040, DSCI 3210, FIN 3250, MGT 3210, MKT 3210,

STAT 2010 or equivalent, advanced business standing, and senior standing. To be taken graduating semester of senior year.

4900. Problems in Management. 1-4 (Max. 4). Studies, on an individual basis, any phase of management not included in the organized course. Written report required. *Prerequisites:* senior standing, advanced business standing, and written consent of instructor.

4910. Selected Topics in Management. 3 (Max. 6 seniors; M.S. and Ph.D. 9). A course for advanced students treating contemporary problems in management and administration. Specific area(s) to be considered in a given semester will be printed in the class schedule. *Prerequisites:* junior standing and other courses, as appropriate, for specific area/topic being covered. Obtain permission and specific listing of prerequisites for enrollment from the GJSSC before registering.

5600. Graduate Internship in Business. 1-4 (Max. 6). Provides student with practical business knowledge, policy, procedure and decision making. Student works as intern in operating organization. *Prerequisite:* 12 hours of graduate preparatory courses and consent of instructor; accepted in a graduate program.

5890. Advanced Problems in Management. 1-8 (Max. 8). An arrangement whereby a student is permitted to develop some advanced phase of management not offered in the formally structured courses, or to investigate a management problem. A written report is required. *Prerequisite:* 9 hours in management including one 5000-level course, accepted in a graduate program and consent of instructor.

Marketing

Marketing is a societal process and a set of organizational functions for creating, communicating, and delivering value to customers and for managing relationships in ways to benefit local and global stakeholders. Marketing majors are employed in a wide variety of industries and governmental agencies where understanding and managing customer relationships are critical. Students find jobs in market research, advertising, public relations, professional selling, non-profit marketing, product management, retailing, digital marketing and brand management.

Marketing

In a addition to university and college requirements cited previously, requirements for marketing majors include the following (21 credits).

Marketing Major	
MKT 4240.....	3
MKT 4520.....	3
MKT 4450.....	3

Marketing Approved Elective Courses	
(3000-level or higher)*.....	3
(3000-level or higher)*.....	3

Advanced Business Electives	
Any Business Course	
(3000-level or higher).....	3
Any Business Course	
(3000-level or higher).....	3

Major Total Credits 21

*Approved Electives for the Marketing Major: MKT 4230, MKT 4440, MKT 4540, MKT 4590, MKT 4910, SELL 3310

A complete curriculum sheet is available from the College of Business Peter M. & Paula Green Johnson Student Success Center in Room 60 West of the College of Business Building.

Doctoral Program

Doctor of Philosophy in Marketing

The Department of Management and Marketing offers a program leading to a Doctor of Philosophy in Marketing, with an emphasis in sustainable business practices. The program of study draws from extant marketing theory, primarily in consumer behavior, combined with studies in the basic sciences (e.g., anthropology, psychology, sociology) and other applied sciences (e.g., environmental sciences) to create a base of knowledge acceptable for marketing scholarship in higher education, and a depth of knowledge conducive to a stream of publishable research in a specific topic area. Theoretical development is supplemented with course work in the gathering and analysis of qualitative and quantitative data, which prepares the student for rigorous exploration of marketing phenomena related to sustainable business practices. Students are required to complete 72 semester hours and a scholarly dissertation that contributes to the knowledge foundations in marketing and contributes to the basic sciences that informed the inquiry. Semester hours will include core marketing classes, outside elective courses in statistics, basic social sciences, and/or interdisciplinary studies in environmental and natural resources, and dissertation work. First and second year research projects are also required, aimed at the student having published articles in respected marketing and social science journals before program completion. Comprehensive exam is completed at the end of the second semester.

All doctoral students are expected to teach while enrolled in the program. The program is designed to give students a strong research background and intensive teaching experience.

We begin accepting applications in October for the following fall semester. All completed applications must be submitted by February 1st. Admission requirements include:

- A Bachelor's Degree and (be working toward or have completed) a Master's Degree from an accredited institution, preferably in business or a core social science discipline
- Completed application (i.e., all required materials submitted) on the UW Graduate Programs Applications system
- Copies of all undergraduate and graduate program transcripts scanned and uploaded to the UW system, and official transcripts from each post-secondary institution attended submitted to the UW admissions office
- A valid GRE or GMAT score. A scanned copy of the unofficial results must be uploaded to the UW system, and official scores must be requested from the testing organization and sent to UW
- Three strong letters of recommendation from research-active academicians. The letters must be uploaded by the recommenders to the UW system in MS Word or .pdf format. Please use this form
- A personal statement summarizing your interest in pursuing doctoral studies and speaking to questions or issues you wish to research. This document must be uploaded to the UW system as an MS Word or .pdf document
- For international students, Test of Foreign Language (TOEFL) scores are required. A scanned copy of the unofficial results must be uploaded to the UW system, and official scores must be submitted to UW from the testing organization. A minimum TOEFL score of 76 (online) or 540 (paper) is required for admission
- \$50 application fee paid to University Admissions

Marketing (MKT)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

1101. First-Year Seminar. 3. [(none)♦FYS]

3110 [4610]. Marketing Ethics. 3. This course examines ethics and social responsibility in marketing. With some grounding in moral reasoning, students explore application of ethical frameworks to various aspects of marketing, including marketing research, target market selection, and marketing mix decisions. Integrative models for incorporating ethics into marketing decision making are applied. *Prerequisite:* MKT 3210, sophomore standing.

3210. Introduction to Marketing. 3. An investigation of the marketing discipline with emphasis on vocabulary; principles; functional interrelationships; marketing strategies, practices and problems in national and international environments. *Prerequisite:* sophomore standing and completion of COM1.

3310 [4210]. [(none)♦COM2] Professional and Technical Selling. 3. This Professional Selling class focuses on business-to-business selling. It examines Organizational Buying Behavior to develop students' understanding of customers. It also investigates the process salespeople go through when presenting solutions to customers. This course is for students from various disciplines wanting to explore sales-focused opportunities within their field of study. Cross listed with SELL 3310. *Prerequisite:* COM1 and sophomore class standing.

4230. Integrated Marketing Communication. 3. Introduction to integrated marketing communication, the coordination of an organization's advertising and promotional efforts. Emphasis on how marketing communication is used by organizations to further their marketing objectives. Among the tools available to the integration process are advertising, sales promotion, personal selling, sponsorship marketing, and public relations. *Prerequisites:* MKT 3210, advanced business standing.

4240. Consumer Behavior. 3. A study of the dimensions of the consumer market and decision-making processes of consumers through analyzing economic, personal, social and situational influences on the consumer market and on buying behavior. *Prerequisites:* MKT 3210, junior class standing.

4250. Digital Marketing. 3. This is an investigation of the digital marketing discipline with an emphasis on e-commerce models, online advertising, digital consumer behav-

ior, privacy considerations, website structure, search engine optimization and social media marketing. *Prerequisite:* MKT 3210 and junior class standing.

4310. Advanced Selling. 3. This course provides students in-depth study of advanced sales concepts including relationship management, problem solving, negotiation, and proposal writing. It also explores the use of data-based decision making and the use of selling technologies. Students will learn how to use data to sell to both resellers and manufacturers. Cross listed with SELL 4310. *Prerequisites:* MKT/SELL 3310 and junior class standing.

4320. Sales Force Strategies. 3. This class will examine the linkages among management of the sales function, personal selling activities, and the marketing area. Students will gain an understanding of the role of the sales force in achieving of the firm's marketing, customer relationship, and revenue objectives. Cross listed with SELL 4320. *Prerequisites:* MKT/SELL 3310 and junior class standing.

4330. Sales Seminar. 3. This course provides students in-depth study of advanced, and cutting edge sales and sales management concepts presenting by top talent in industry. While topic can vary, this seminar teams students with industry experts to explore state-of-the-art thinking in technical sales, sales management, sales training, compensation, and team selling. Cross listed with SELL 4330. *Prerequisites:* MKT/SELL 3310 and junior class standing.

4430. Marketing Management. 3. Analysis of policy-making and operating decisions of the marketing manager and the tools available to aid in solving marketing problems. *Prerequisites:* MKT 3210, MGT 3210, STAT 2010 or equivalent.

4440. Services Marketing. 3. This course is designed for students who may be interested in working in service industries and will address the distinct needs and problems of service firms in the area of marketing. *Prerequisites:* HOSP 2000 or MKT 3130.

4450. Advanced Marketing Management. 3. [(none)♦] Capstone course for marketing majors and minors designed to integrate prior marketing courses. Primary focus is on utilizing marketing concepts and tools in a strategic marketing decision-making context. *Prerequisites:* MKT 3130, MKT 4520, junior class standing.

4520. Marketing Research and Analysis. 3. Investigation of the systematic procedures and tools of research available to the marketing researcher, including a survey of contemporary practices. *Prerequisites:* MKT 3210, junior class standing.

4540. International Marketing. 3. Approaches the topic of international marketing from a managerial perspective. Exposure to world environmental characteristics and interdependencies, as well as objectives, strategies and tactics of marketing goods and services to various countries and cultures. Cross listed with INST 4540. *Prerequisite:* MKT 3210 and junior standing.

4590. Sustainable Business Practices. 3. A close look at what is happening in business practice today through the 'lens' of sustainability. Business models and systems will be discussed and a framework proposed for assessing the ways in which principles of sustainability may be embedded within corporate strategy. Cross listed with INST 4590; dual listed with MKT 5590. *Prerequisites:* advanced business standing.

4600. Campus Sustainability. 3. Uses campus as a setting to explore long-term environmental, economic, and social sustainability theory and practice. Students design and implement a semester-long project to improve sustainability of the UW campus. Interdisciplinary and appropriate for students of all disciplines. Dual listed with MKT 5600; cross listed with ENR 4600. *Prerequisite:* advanced business standing for COB majors, junior standing for non-COB majors.

4900 Problems in Marketing. 1-4 (Max. 4). Studies, on an individual basis, any phase of marketing not included in the organized courses. A written report is required. *Prerequisites:* advanced marketing courses as appropriate, advanced business standing; requires written consent of instructor.

4910. Selected Topics in Marketing. 3 (Max. 6). A course for advanced students treating contemporary problems in marketing related areas. Specific area(s) to be considered in a given semester will be printed in class schedule. *Prerequisites:* junior standing and other courses, as appropriate, for specific area/topic being covered. Obtain permission and specific listing of prerequisites for enrollment from the Academic Advising unit of the GJSSC before registering.

5250. Behavioral Theory I. 3. Expose doctoral students to prospective outcomes on consumer behavior that draw from a variety of disciplines, including marketing, psychology, decision theory, sociology, and cultural anthropology. Students also learn about the different methods researchers employ to study consumers.

5280. Behavioral Theory II. 3. This seminar provides a sampling of consumer research rooted in psychological theories and frameworks. The historical development of consumer behavior in marketing cognitive and related contributions to marketing though development will be explored.

5350. Marketing Models. 3. Familiarizes students with quantitative modeling approaches to address a variety of marketing problems. The focus is on the nature, relevance, and properties of mathematical models and analytical methods that are employed to address various types of marketing decisions. Students must be accepted into the graduate program.

5450. Marketing Theory I. 3. The purpose of this class is to provide students with an in-depth understanding of the role and development of theory in marketing and related disciplines. Students must be accepted into the graduate program.

5590. Sustainable Business Practices. 3. A close look at what is happening in business practice today through the lens of sustainability. Business models and systems will be discussed and a framework proposed for assessing the ways in which principles of sustainability may be embedded within corporate strategy. Cross listed with INST 5590; dual listed with MKT 4590. *Prerequisite:* advanced business standing.

5600. Campus Sustainability. 3. Uses campus as a setting to explore long-term environmental, economic, and social sustainability theory and practice. Students design and implement a semester-long project to improve sustainability of the UW campus. Interdisciplinary and appropriate for students of all disciplines. Dual listed with MKT 4600; cross listed with ENR 5600. *Prerequisite:* advanced business standing for COB majors, junior standing for non-COB majors.

5890. Advanced Problems in Marketing. 1-8 (Max. 8). An arrangement whereby a student is permitted to develop some advanced phase of marketing not offered in formally structured courses, or to investigate a marketing problem. A written report is required. *Prerequisite:* 9 hours in marketing including one 5000-level course, written consent of instructor, accepted in a graduate program.

5940. Continuing Registration: Off Campus. 1-2 (Max. 12).

5980. Dissertation Research. 1-12 (Max. 42). Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisites:* enrolled in a graduate degree program.

Professional Sales Major

The Professional Sales major prepares students to manage business clients of for-profit and nonprofit organizations. Specifically, this major provides business students with coursework and opportunities to equip themselves with essential knowledge and skills required to begin professional careers in sales. Careers in sales offer independence, ample financial reward, personal growth and opportunities for rapid advancement within organizations. Students that pursue a degree in professional sales will be challenged with industry engagement opportunities such as internships, and sales competitions. Students experience rigorous classroom experiences designed to develop the knowledge and practical skills needed to succeed during the first years of their sales careers including: oral and written communication skills, selling techniques and networking, the use of sales technology and customer information, and sales pipeline management.

All professional sales majors must comply with requirements of the advanced business prerequisites for enrollment in upper-division courses and must complete the common body of knowledge courses as listed previously. All professional selling courses for the major require a minimum grade of C.

In addition to university and college requirements cited previously, requirements for majors in professional sales include the following. (21 credit hours):

Professional Sales Requirement	
SELL 3310	3
SELL 4310	3
SELL 4320	3
SELL 4330	3

Advanced Business Electives	
Professional Selling Approved Course (3000-level or higher)*	3
Any Business Course (3000-level or higher)	3
Any Business Course (3000-level or higher)	3

Major Total Credits 21

*Approved Electives for the Professional Sales Major: MGT 4470, DSCI 4230, DSCI 4280, DSCI 4260, FIN 4250, SELL 4910.

Professional Sales (SELL)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

3310. [(none)♦COM2] Professional and Technical Selling. 3. This Professional Selling class focuses on business-to-business selling. It examines Organizational Buying Behavior to develop students' understanding of customers. It also investigates the process salespeople go through when presenting solutions to customers. This course is for students from various disciplines wanting to explore sales-focused opportunities within their field of study. Cross listed with MKT 3310. *Prerequisite:* COM1 and sophomore class standing.

4310. Advanced Selling. 3. This course provides students in-depth study of advanced sales concepts including relationship management, problem solving, negotiation, and proposal writing. It also explores the use of data-based decision making and the use of selling technologies. Students will learn how to use data to sell to both resellers and manufacturers. Cross listed with MKT 4310. *Prerequisites:* MKT/SELL 3310 and junior class standing.

4320. Sales Force Strategies. 3. This class will examine the linkages among management of the sales function, personal selling activities, and the marketing area. Students will gain an understanding of the role of the sales force in achieving of the firm's marketing, customer relationship, and revenue objectives. Cross listed with MKT 4320. *Prerequisites:* MKT/SELL 3310 and junior class standing.

4330. Sales Seminar. 3. This course provides students in-depth study of advanced, and cutting edge sales and sales management concepts presenting by top talent in industry. While topic can vary, this seminar teams students with industry experts to explore state-of-the-art thinking in technical sales, sales management, sales training, compensation, and team selling. Cross listed with MKT 4330. *Prerequisites:* MKT/SELL 3310 and junior class standing.

Master of Business Administration (MBAM)

MBA Programs Office

1000 E. University Ave., Dept. 3275

Laramie, WY 82071

(307) 766-2449

Email: mba@uwyo.edu

Web site: www.business.uwyo.edu/mba

MBA - General

MBAE - Energy Management

MBAF - Finance

Program Overview

The UW MBA Program delivers professional management education that connects principles, concepts, and intense case analysis with real world experience as tools for making business decisions. Students will develop leadership and managerial skills. UW MBAs will possess the education and training to compete in today's rapidly changing global business world.

Class sizes are small and diverse. Courses are taught by a select group of business faculty members. The total program experience (both inside and outside the classroom) is designed to provide experiential learning along with access to powerful networks.

Admission Requirements

A Faculty Admissions Committee, chaired by the Director of the MBA Program, will review all applications. Application to the program is open to students who have a baccalaureate degree from an accredited university or college. Students with a baccalaureate degree in a business discipline or business administration are eligible for the program, but will not be allowed to waive any of the core course requirements.

Applicants must provide official academic transcripts, GMAT or GRE test results, two letters of recommendation, and a current resume.

Students whose native language is not English must submit TOEFL results. There are no exceptions for students from other UW colleges and schools seeking dual degrees. If an international applicant wishes to be considered for GA funding, the applicant should also submit the results of an Oral Proficiency Interview (OPI). Please contact the UW English Language Center (<http://www.uwyo.edu/elc/>) if you have questions regarding the English proficiency requirements.

Please be advised that our program includes significant class discussion, substantial daily reading, many written assignments, and presentations.

Attainment of minimum requirements does not guarantee admission

- Completed UW Graduate Application and nonrefundable application fee: www.uwyo.edu/admissions/apply.html
- Bachelor's degree from a regionally accredited university or college
- A cumulative undergraduate GPA of 3.000, preferred. Based on a 4.000 scale.
- GMAT or GRE exam scores
- Two (2) letters of recommendation
- Professional resume
- An interview will be requested upon completion of the application. On-campus preferred, but interviews can also be arranged via telephone or video conference.
- Official transcripts from each institution attended. Transcripts should be sent directly to UW Admissions.

Applications for each Fall term are accepted until June 30th the year of planned enrollment.

Additional International Student Admission Requirements:

- Sufficient financial resources as established by the University of Wyoming.
- A minimum TOEFL score of 100 on the Internet-based exam. TOEFL scores are valid for two years. IELTS scores can be submitted in place of the TOEFL with a minimum score requirement of 7. An applicant whose native language is English and is a citizen of one of the following countries or has earned a university level degree from a school in one of the following countries *may* be exempt from providing additional proof of English proficiency. Antigua & Barbuda, Bahamas, Belize, Grenada, Guyana, Jamaica, St. Kitts & Nevis, St. Lucia, Dominica, St. Vincent & the Grenadines, Trinidad & Tobago, Australia, Bermuda, Canada (all provinces except Quebec), Ireland, New Zealand, and the United Kingdom.

*Note: Prerequisite coursework and the GMAT/GRE may be waived based on a case-by-case basis. Please refer to www.uwyo.edu/

[mba/degree-programs/campus-programs/admission-requirements.html](#) or contact the MBA Program Office for more information.

*Important: Attainment of minimum requirements does not guarantee admission.

Degree Requirements

- 47 to 59 credit hours of graduate credit (38 hours of required Core MBA courses plus 9 to 21 hours of track courses), including participation in all MBA Program activities (orientation, the MBA Executive Leadership Program, Professional Development, Experiential Leadership Program, etc.) Please note: students enrolled in any dual degree MBA program are required to complete all MBA participation activities and the core 38 credit hours of coursework.
- This is a cohort based program. The course sequence is highly-structured and all course requirements must be completed in their prescribed manner. Course sequence is subject to change, in extremely rare circumstances, at the discretion of the MBA Director.
- Maintain good academic standing at the program and university level and receive no letter grade of D or F. If a letter grade of D or F is received student will be immediately dismissed from the program.

Course of Study

(sequence subject to change only at the direction of the MBA Program Director)

Pre-Term 1

Students participate in an orientation, an experiential leadership program, and the Jackson Leadership Conference. Students may also receive pre-term assignments for the Fall 1 core courses as well as pre-term prep course material.

Fall 1: MBA Core (16 credit hours)

- MBAM 5108 MBA Financial Accounting. 3.
- MBAM 5103 Business Research Methods. 3.
- MBAM 5107 Decision Making I. 1.
- MBAM 5202 #304 Data and Modeling. 3.
- MBAM 5106 Professional Development I. 0.
- MBAM 5309 Managerial Economics I. 3.
- MBAM 5104 Org. Behavior & HRM. 3.

Spring 1: MBA Core (16 credit hours)

- MBAM 5208 Managerial Accounting. 3.
- MBAM 5204 Financial Management. 3.
- MBAM 5207 Marketing Management. 3.
- MBAM 5203 Entrepreneurial Management. 3.
- MBAM 5102 Operations Management. 3.
- MBAM 5206 Professional Development II. 0.
- MBAM 5209 Decision Making II. 1.

Summer: MBA Core (3 credit hours)

- MBAM 5301 MBA Summer Project. 3. (estimated May – July)

Pre-Term 2

Students will participate in the Jackson Leadership Conference for a second time and may receive pre-term coursework for Fall 2 courses.

Fall 2: Core (3 credits)

- MBAM 5305 Strategic Management #304. 3. *includes international travel

Fall 2: Track Specific Courses (9 credits)**Spring 2: Track Specific Courses (12 credits)****MBA-MBA Track Courses (Fall Only)**

- Any 9 credit hours of MBAM coursework. Other graduate elective courses can be considered, but must be approved by the MBA Program Director.

MBA-MBAE Track Courses (Fall or Spring)

- MBAM 5503 Fund Accounting Energy Industry. 3.
- MBAM 5502 Energy Finance: Project Evaluation. 3.
- MBAM 5504 Supply Chain Mgmt in the Energy Ind. 3.
- MBAM 5501 Energy Econ. and Public Policy. 3.
- MBAM 5800:Topic:Oil and Gas Law. 3.
- MBAM 5506 Energy Finance: Energy Trading, Hedging and Securities. 3.
- MBAM 5508 Marketing and Sustainable Consumption. 3.

MBA-MBAF Track Courses (Fall or Spring)

- MBAM 5303 International Business. 3.
- MBAM 5401 Investment Management and Analysis. 3.
- MBAM 5402 Corporate Finance & Governance. 3.
- MBAM 5502 Energy Finance: Project Evaluation. 3.

- MBAM 5506 Energy Finance: Energy Trading, Hedging and Securities. 3.
- MBAM 5800: Topics: Valuation. 3.
- MBAM 5800 Topics: Risk Management. 3.

Dual Degree Programs

The following dual degree programs are available:

- MS in Engineering / MBA
- Pharm. D. /MBA
- J.D. / MBA
- International MBA (Pforzheim University)

Students will need to be admitted to both degree programs. The MBA Core courses are required of all students, including the Capstone course in the second fall term. At the completion of all graduate studies, students will receive two degrees.

Students interested in a dual degree must meet all MBA admission requirements and respective college/department requirements.

Dual Degree Requirements

MBA Core (38 credit hours - Fall 1, Spring 1, MBAM 5301, and Fall 2 capstone MBAM 5305). The 9 additional credit hours required to reach a total of 47 MBA degree credit hours are shared electives between dual degree programs for JD/MBA, MS/MBA and PharmD/MBA.

Additional Information**Tuition & Fees**

Tuition and fee charges will include required program events/activities. Textbooks are not included.

MBA Executive Leadership Program

Students participate in weekly meetings (primarily on Fridays) with business leaders from a wide variety of industries (business, government, and non-profit entities). The program takes place mostly on campus, but does include some travel. This program supplements the class work, provides discussion and learnings of business challenges, opens the students' horizons on career opportunities, and provides long-term networking opportunities.

Experiential Learning Project

The required Summer Experiential Learning project will give students the opportunity to address real-world strategic issues for business, government, and non-profit entities. The project will be administered from the UW campus and students will have access to COB

facilities to perform analyses, develop recommendations, and prepare a written and oral presentation to senior management. Students will travel to company sites and other locations for data collection and interviews, as appropriate. College faculty will participate in these projects as mentors. Students cannot take any other courses during the summer experiential learning project.

Experiential Leadership Program

Students focus on improving leadership competence and focus on teamwork outside of the typical business element. This experience has been tailored to represent an experiential case study on effective leaders and effective teams.

Jackson Leadership Conference

Exclusive leadership development event for MBA students to network with an astute panel of individuals with proven business success. Topics usually focus on the global economy and strategic planning.

Track Courses

9 to 21 credit hours of coursework determined by the student's track. Courses for dual degree students will be determined by both colleges and/or departments.

Online MBA Program

Students enrolled in the campus MBA programs may, on a case-by-case basis, apply credits from the Online MBA Program (courses with a MBAX prefix) to their degree, and vice versa. Must be approved by the Program Director.

Academic Requirements

Students must maintain a cumulative GPA of 3.000 in the MBA Program to remain in "good standing". If a student's GPA falls below 3.000, he or she is automatically placed on academic probation; the student must raise their cumulative GPA to 3.000 the following semester to avoid dismissal from the program. Other requirements involving program dismissal include:

- A student who earns a grade lower than a "C" in any course is dismissed from the program

Master of Business Administration (MBAM)

5102. Operations Management. 3. Production and operations management. Topics include operations strategy, quality management, facilities location, facilities layout, forecasting, inventory management, production planning, and scheduling. *Prerequisite:* Admission to the MBAM program.

5103. Business Research Methods. 3. An overview of the scientific research process applied in the context of business. Topics include problem definition, selection of a methodological approach, design and implementation of field work (qualitative and survey methods), analysis techniques (thematic analysis for qualitative research and statistical analysis for survey research, and communicating results. *Prerequisite:* Admission to the MBAM program.

5104. Organization Behavior and Human Resource Management. 3. Enables students to recognize psychological phenomena influencing individual, group & organizational behavior and helps them understand different HRM functions and how HRM fits within the overall organization's strategy. *Prerequisite:* Admission to the MBAM program.

5106. Professional Development I. 0. First course is a sequence of courses focused on professional development. This course will provide "a real world" format where students must express their ideas in every class through verbal presentations, as well as developing written products such as handouts, Power-Point presentations, white papers and email correspondence. *Prerequisite:* Admission to the MBAM program.

5107. Decision Making I. 1. This course develops a systematic process for making decisions in complex business situations, by integrating six dimensions of business risk: competitive, financial, organizational, legal, social, and ethical. The process combines analytical and ethical reasoning methods that compensate for the flawed decision making common in business organizations. *Prerequisite:* Admission to the MBAM program.

5108. Financial Accounting. 3. This course provides students with tools to use financial information from the accounting system. The course addresses how financial statement information is used to make business decisions and allows students to learn about how generally accepted accounting principles are applied to and account for and report on business transaction results. #304. *Prerequisite:* Admission to the MBAM program.

5202. Data and Decision Modeling. 3. This course will prepare students to use computer-based models for solving problems in the areas of operations, finance, supply chain, and marketing by using tools associated with predictive and prescriptive data analytics including, but not limited to forecasting, optimization modeling, and Monte Carlo simulation. #304. *Prerequisite:* Admission to the MBAM program.

5203. Entrepreneurial Management. 3. Explores organizations – theories and practical applications of those theories concerning how organizations operate strategically, i.e. in relation to the external environment. *Prerequisite:* Admission to the MBAM program.

5204. Financial Management. 3. Students taking this course should expect to learn the fundamentals principles of environmental influences on corporate financial decision-making and measurement devices useful in corporate financial management. Provides an in-depth understanding of the financial manager's role in a corporate setting and exposes students to other aspects of finance in the economy. #304. *Prerequisite:* Admission to the MBAM program.

5206. Professional Development II. 0. Second part of a sequence of courses designed to help students advance their professional skills (written, oral, and interpersonal) and achieve success in career planning, career preparation, and career development. *Prerequisite:* Admission to the MBAM program.

5207. Marketing Management. 3. Provide an in-depth understanding of marketing management. Marketing managers are responsible for co-creating customer value for a sustained competitive advantage. *Prerequisite:* Admission to the MBAM program.

5208. Managerial Accounting. 3. This course introduces concepts and methodologies of managerial accounting focusing on the use of accounting information for internal decision-making purposes. The primary objective is to learn how cost-based information is used to make informed business decisions for strategic planning and control as well as performance evaluation of business decisions. *Prerequisite:* Admission to the MBAM program.

5209. Decision Making II. 1. An experiential learning course that builds on MBAM 5107. Students apply systematic business decision making process to real-world business situations. Student teams work directly with owners and managers of Wyoming companies to address their strategic, competitive, operational, financial, and/or administrative challenges in real time. *Prerequisite:* MBAM 5107.

5301. MBA Summer Project. 3. Serves as an externship for individual MBA students or MBA teams to work with a client on a business issue under the supervision of a qualified faculty member in the College of Business. *Prerequisite:* Completion of the first-year (Fall & Spring semester) on campus MBA courses.

5303. International Business. 3. Focus on the topics of culture, effects of the macro-environment on business, and regional economic integration, with predominant themes of leadership and sustainability in business. *Prerequisite:* Admission to the MBAM program.

5304. Business Law. 3. Broad perspective of the various legal issues associated with managing a business enterprise. *Prerequisite:* Admission to the MBAM program.

5305. Strategic Management. 3. Business strategy is a core function of executive leadership. Students learn methods, models and frameworks for formulating business and corporate level strategies for assessing and sustaining competitive advantage in dynamic and global business environments. Students master these tools through in-depth application and analysis of business programs resulting in strategic recommendations. *Prerequisite:* Admission to the MBAM program. #304.

5309. Managerial Economics. 3. Discuss a variety of tools and concepts intended to give you the background in economics and decision-making you will need to be an effective manager in a world where economic circumstances are uncertain and changing constantly. *Prerequisite:* Admission to the MBAM program.

5311. MBA Managerial Economics II. 1. Continue discussion of a variety of tools and concepts intended to give you the background in economics and decision-making you will need to be an effective manager in a world where economic circumstances are uncertain and changing constantly. *Prerequisite:* Admission to the MBAM program, completion of MBAM 5309.

5401. Investment Management and Analysis. 3. The theory of investment management and security values, portfolio management including the analysis of investment policies and objectives, the analysis and use of investment information, and the development and application of the tools for determining values. *Prerequisite:* Admission to the MBA Program or permission of the MBA Program Director or the MBA Program Coordinator.

5402. Corporate Finance and Governance. 3. Designed to provide a framework to analyze issues in corporate finance and governance. The firm is viewed as a nexus of contracts designed to reduce the costs of trade - and

corporate finance is regarded as an investigation of the incomplete contracts that involve the providers of capital. *Prerequisite:* Admission to the MBA Program or permission of the MBA Program Director or the MBA Program Coordinator.

5403. Financial Modeling. 3. Involves the application of basic econometric methods to the analysis of financial data. Focus is on utilizing spreadsheets and other softwares to facilitate financial decision making. Dual listed with FIN 5400. *Prerequisite:* Admission to the MBA Program or permission of the MBA Program Director or the MBA Program Coordinator.

5404. Seminar on Management Fraud. 3. An in-depth study and analysis of the causes, methods, and consequences of financial statements fraud committed by top management in the organization. The course covers psychological and criminological theories of management fraud, as well as detailed analysis of high-profile managements frauds. Seminar format. Cross listed with ACCT 5066. *Prerequisite:* Permission of the MBA Program Director or the MBA Program Coordinator.

5501. Energy Economics and Policy. 3. Applies the tools of economic analysis to attain and understanding of energy markets and energy policy analysis. Sec. 1 Overviews the major energy and environmental policy issues facing the United States and the world. Sec 2 Determinants of energy demand. Sec. 3 Technologies and costs to produce and deliver energy. Sec. 4 Determinants of energy price. *Prerequisite:* Permission of MBA Program Director, or student's graduate program coordinator in consultation with MBA Program Director.

5502. Energy Finance: Project Evaluation. 3. Introduction (i) to traditional engineering cost methods to evaluate investments in energy and mineral projects and (ii) to modern techniques to make these decisions under uncertainty given the technical and economic risk facing minerals industries. *Prerequisite:* Permission of MBA Program Director.

5503. Fundamentals of Accounting in the Energy Industry. 3. Introduces students to basic financial accounting and reporting issues related to energy producing activities. Specifically, the course will investigate current accounting practices of energy producing companies related to exploration, acquisition, development, and delivery of energy products. The course will also cover financial requirements of the Financial Accounting Standards Board (FASB), the International Accounting Standards Board (IASB), and the Securities

and Exchange Commission (SEC). Cross listed with ACCT 5503. *Prerequisite:* Permission of MBA Program Director, or student's graduate program coordinator in consultation with MBA Program Director.

5504. Supply Chain Management in the Energy Industry. 3. Examines the field of supply chain management in an energy context. Study procurement and distribution strategies, concepts, tools and techniques that support energy operations. Course activities and case studies will address effective execution of these strategies and the appropriate supporting activities. *Prerequisite:* Permission of MBA Program Director, or student's graduate program coordinator in consultation with MBA Program Director.

5506. Energy Finance: Securities, Hedging, and Trading. 3. Overview of security analysis applied to energy firms, hedging strategies, and trading activities in energy markets. Trading activities covered include the use of forward and futures contracts, swaps, options, and related derivatives. *Prerequisite:* Permission of MBA Program Director.

5507. Energy Business Strategy (Capstone). 3. Improving an organization's competitiveness in changing global energy environments. Includes an overview of the geopolitics of global energy, and the risks involved. Emphasizes skill-development for formulating and implementing business-level, corporate, and global strategies in dynamic environments. *Prerequisite:* Permission of MBA Program Director, or student's graduate program coordinator in consultation with MBA Program Director.

5508. Marketing and Sustainable Consumption. 3. Focuses on understanding household and business energy consumption. Emphasizes the environmental, economic, social and psychological influences on consumer decision making and sustainable consumption. Course deals with developing customer value propositions, and for marketing strategy development in branding, product-line offerings, pricing, retailing and distribution, and public policy. *Prerequisite:* Permission of MBA Program Director, or student's graduate program coordinator in consultation with MBA Program Director.

5800. MBA Topics. 1-3. A course for MBA students treating contemporary problems in business related areas. Specific area(s) to be considered in a given semester will be printed in class schedule. *Prerequisite:* Admission to the MBAM program.

Online Master of Business Administration (MBAX)

MBA Programs Office

1000 E. University Ave., Dept. 3275

Laramie, WY 82071

Phone: (307)766-2449

Email: mba@uwyo.edu

Web site: www.business.uwyo.edu/mba

The University of Wyoming offers a part-time Online MBA (EMBA). The EMBA Program is specifically designed for experienced business professionals interested in an AACSB accredited, 100% online program that fits their busy schedules. This two-year program is for professionals interested in enhancing their understanding of business disciplines and applying them to making decisions. Beginning each fall, the cohort-based program consists of 30 credit hours of coursework.

Program Admission Requirements

A Faculty Admissions Committee, chaired by the Director of the MBA Program, will review all applications. Admission to the Online MBA program is competitive, and only top candidates will be considered. (These requirements represent minimum applicant qualifications.) The committee will review all admission documents to determine if the applicant can successfully complete the program. The EMBA admission requirements include:

- Completed UW Graduate Application and nonrefundable application fee: www.uwyo.edu/admissions/apply.html.
- Bachelor's degree from a regionally accredited university or college
- A cumulative undergraduate GPA of 3.000, preferred. Based on a 4.000 scale.
- Two (2) letters of recommendation
- Professional resume
- Five or more years progressive, full-time professional work experience, preferred.
- Official transcripts from each institution attended. Transcripts should be sent directly to UW Admissions.
- An interview is not required, but encouraged and may be conducted after submission of a completed application. To request an interview, please contact the MBA Program office at mba@uwyo.edu or (307) 766-2449.

*Note: Prerequisite coursework and the GMAT/GRE may be waived on a case-by-case basis. Please refer to www.uwyo.edu/mba/degree-programs/online-programs/admission-requirements.html or contact the MBA Program Office for more information.

*Important: Attainment of minimum requirements does not guarantee admission.

Application Deadlines

Fall Admission: All required application materials are due by June 30 the year of planned enrollment.

Spring Admission: All required application materials are due by December 1 the year prior to planned enrollment.

Summer Admission: All required application materials are due by March 1 the year of planned enrollment.

www.uwyo.edu/mba/degree-programs/online-programs/admission-requirements.html

Degree Requirements

- 30 credit hours of graduate credit as outlined in the Course of Study.
- Concentration Available: Energy (EMN)
- This is a cohort based program. The course sequence is highly-structured and all course requirements must be completed in their prescribed manner. Course sequence is subject to change, in extremely rare circumstances, at the discretion of the MBA Director.
- Maintain good academic standing at the program and university level and receive no letter grade of D or F. If a letter grade of D or F is received, student will be immediately dismissed from the program.

Prerequisite Courses

Prerequisite coursework may be requested based on experience and undergraduate coursework at the discretion of the MBA Program Director. Please contact the MBA Program office for transcript analysis and resume evaluation prior to beginning any prerequisite course work.

Academic Requirements

Students must maintain a cumulative GPA of 3.000 in the MBA Program to remain in “good standing”. If a student’s GPA falls below 3.000, he or she is automatically placed on academic probation; the student must raise their cumulative GPA to 3.000 the following

semester to avoid dismissal from the program. Other requirements involving program dismissal include:

- A student who earns a grade lower than a “C” in any course is dismissed from the program

Course of Study

30 credit hours (Core)

- MBAX 5108 Financial Accounting. 3. #304
- MBAX 5103 #304 Business Research Methods. 3.
- MBAX 5204 #304 Financial Management. 3.
- MBAX 5235 Marketing Analysis & Strategy. 3.
- MBAX 5205 Data and Decision Modeling #304. 3.
- MBAX 5104 #304 Organizational Behavior & Human Resource Management. 3.
- MBAX 5151 New Ventures. 3.
- MBAX 5330 The Global Business Environment. 3.
- MBAX 5208 MBA Managerial Accounting. 3.
- MBAX 5305 #304 Strategic Management. 3.

Energy Concentration Courses (9 credit hours)

- MBAX 5503 Fundamentals of Accounting in the Energy Industry. 3.
- MBAX 5504 Supply Chain Management in the Energy Industry. 3.
- MBAX 5502 Energy Finance: Project Evaluation. 3.

Online Master of Business Administration (MBAX)

5108. Financial Accounting. 3. This course provides students with tools to use financial information from the accounting system. This course addresses how financial statement information is used to make business decisions and allows students to learn about how generally accepted accounting principles are applied to and account for and report on business transaction results. #304. *Prerequisite:* Admission to the MBA online program, or permission from the MBA Program Director.

5151. New Ventures. 3. Explores and evaluates various intrapreneurial and entrepreneurial opportunities, including business plans. Also considers the dynamic business environment characterized by technology diversity and global enterprise. Students analyze a business oppor-

tunity and make a presentation to potential investors. *Prerequisites:* Admission to the MBA online program, or permission from the MBA Program Director.

5103. #304 Business Research Methods. 3. An overview of the scientific research process applied in the context of business. Topics include problem definition, selection of a methodological approach, design and implementation of field work (qualitative and survey methods), analysis techniques (thematic analysis for qualitative research and statistical analysis for survey research, and communicating results. *Prerequisite:* Admission to the MBA online program, or permission from the MBA Program Director.

5208. Managerial Accounting. 3. This course introduces concepts and methodologies of managerial accounting focusing on the use of accounting information for internal decision-making purposes. The primary objective is to learn how cost-based information is used to make informed business decisions for strategic planning and control as well as performance evaluation of business decisions. #304. *Prerequisite:* Admission to the MBA online program, or permission from the MBA Program Director.

5202. Data and Decision Modeling. 3. This course will prepare students to use computer-based models for solving problems in the areas of operation, finance, supply chain, and marketing by using tools associated with predictive and prescriptive data analysis including, but not limited to forecasting, optimization modeling, and Monte Carlo simulation. #304. *Prerequisite:* Admission to the MBA online program, or permission from the MBA Program Director.

5235. Marketing Analysis and Strategy. 3. Understanding market orientation and the strategic marketing process is the goal of this course. Uses various tools and secondary data sources to assess current market opportunities/threats. Discusses customer targeting and relationship development, as well as strategic issues of branding, integrated marketing communications, product management, pricing, and distribution in various business exchanges. *Prerequisite:* Admission to the MBA online program, or permission from the MBA Program Director.

5104. #304 Organizational Behavior & Human Resource Management. 3. Enables students to recognize psychological phenomena influencing individual, group & organizational behavior and helps them understand different HRM functions and how HRM fits within

the overall organization's strategy. *Prerequisite:* Admission to the MBA online program, or permission from the MBA Program Director.

5330. The Global Business Environment. 3. Introduction to international business through theoretical and applied macroeconomics and the environment in which global business occurs. Focuses on interest/exchange rates; effects of culture on consumers and organizational environments; product/information flows; budget/trade balances; organizations central to a functioning global economy; demand/fulfillment; and legal/ethical issues. *Prerequisite:* Admission to the MBA online program, or permission from the MBA Program Director.

5305. Strategic Management. 3. Business strategy is a core function of executive leadership. Students learn methods, models and frameworks for formulating business and corporate level strategies for assessing and sustaining competitive advantage in dynamic and global business environments. Students master these tools through in-depth application and analysis of business programs resulting in strategic recommendations. #304. *Prerequisite:* Admission to the MBA online program, or permission from the MBA Program Director.

5350. Marketing, Markets, and Society. 3. Introduction to the interplay between marketing, markets and society. Issues and controversies for business persons are discussed in an online environment; these are analyzed and synthesized. Developing a wide, long, and integrative viewpoint for forming plans and actions are a principle objective. *Prerequisite:* admission to EMBA program.

5400. Enterprise Information Systems. 3. Employs various formats to examine the relationship between an organization's resources, events, and agents to create databases that form the centerpiece of ERP systems. Topics include enterprise system integration, representation, and patterns, value system and value chain modeling, information retrieval implementation, and controls. *Prerequisite:* admission into MBAX Program.

5502. Energy Finance: Project Evaluation. 3. Introduction to traditional engineering cost methods to evaluate investments in energy and mineral projects, and to modern techniques to make these decisions under uncertainty given the technical and economic risks facing minerals industries. *Prerequisite:* Admission to the MBA program, or permission of the MBA Program Director or the MBA Program Coordinator. #304.

5503. Fundamentals of Accounting in the Energy Industry. 3. Introduction to basic financial accounting and reporting issues related to energy producing activities. Investigate current accounting practices of energy producing companies related to exploration, acquisition, development, and delivery of energy products. Cover financial requirements of the Financial Accounting Standards Board (FASB), the International Accounting Standards Board (IASB), and the Securities and Exchange Commission (SEC). *Prerequisite:* Admission to the MBA program, or permission of the MBA Program Director or the MBA Program Coordinator. #304.

5504. Supply Chain Management in the Energy Industry. 3. Examines the field of supply chain management in an energy context. Study procurement and distribution strategies, concepts, tools and techniques that support energy operations. Course activities and case studies will address effective execution of these strategies and the appropriate supporting activities. *Prerequisite:* Admission to the MBA program, or permission of the MBA Program Director or the MBA Program Coordinator. #304.

5204. Financial Management. 3. Students taking this course should expect to learn the fundamental principles of environmental influences on corporate financial decision-making and measurement devices useful in corporate financial management. Provides an in-depth understanding of the financial manager's role in a corporate setting and exposes students to other aspects of finance in the economy. #304. *Prerequisites:* Admission to the MBA program, or permission from the MBA Program Director. #304.

The College of Education prepares teachers, counselors, administrators and other service personnel for positions in public education in Wyoming, throughout the nation, and the world. The teacher education program incorporates content area courses from the various colleges on campus with experiences in educational methodology. Programs are designed to provide students with a maximum amount of experience in the classroom.

Graduates of the College of Education are prepared to deal with youth growing up in a rapidly changing world. Programs are experiential, collaborative, outcomes based, and technologically supported. Emphasis is placed on professional ethics, a commitment to lifelong learning, and respect for all individuals in our culturally diverse society.

Programs of Study

Undergraduate Degrees

Bachelor of Science

Agricultural education
Technical Education

Bachelor of Arts

Elementary education
Secondary education
Elementary/special education

Graduate Degrees

Master of Science

Master of Science in Counseling

Master of Arts

Doctor of Philosophy

Doctor of Education

Doctor of Counselor Education and Supervision

Accreditation

The College of Education, a member of the American Association of Colleges of Teacher Education, is accredited by the National Council for Accreditation of Teacher Education. The Wyoming Professional Teaching Standards Board and the North Central Association of Colleges and Schools approve the college as an accredited teacher-preparing institution.

The Counseling programs are fully accredited by the Council for Accreditation of Counseling and Related Educational Programs Board.

Organization of the College

The College of Education includes undergraduate teacher education and graduate studies in education. Schools offering undergraduate and graduate programs in the college include Teacher Education and Counseling, Leadership, Advocacy, and Design.

Undergraduate and graduate education are supported by several units. The Teacher Preparation and Advising Office, McWhinnie Hall room 100, coordinates activities dealing with academic advising, field experiences, and teacher licensure.

The Wellspring Counseling Clinic provides counseling services to students, staff, faculty of the university, as well as the community at-large.

The College of Education, College of Arts and Sciences, Wyoming community colleges, many Wyoming districts, the Wyoming Professional Teaching Standards Board, and the Wyoming Department of Education are part of the Wyoming School-University Partnership, which grounds collaborative efforts across the state related to K-12 preservice and inservice education.

The Laboratory School, an Albany County School District entity, serves the college, the university, the school district, and the state as an educational center for research, development, instructional advancement, and inservice education. The school enrolls students in pre-school through eighth grade.

Computer laboratories in the college feature a wide range of capabilities including Internet access. The laboratory equipment is frequently updated to serve the needs of students, faculty and staff.

The Learning Resource Center is a branch of the university library system. Educational materials are available to serve the needs of K-12 students, university students, university faculty and public school faculty in Wyoming

B.A. and B.S. degrees in the College of Education are housed in the School of Teacher Education and consist of increasingly demanding phases of professional preparation. Competencies based on professional standards, including those mandated by the Wyoming Professional Teaching Standards Board (PTSB), are addressed developmentally. A teacher candidate graduating from this program will have mastered competencies required by the PTSB and the education profession.

Freshman year (Preprofessional): Students concentrate on the University Studies Program requirements. EDST 2450, Foundations of Development and Learning, must be completed prior to moving into Phase I.

Phase I: Sophomore students are introduced to teaching and learning through EDST 2480, Diversity and the Politics of Schooling. This course includes a field experience in a public school setting.

Phase II: A junior-level experience extends student competence through EDST 3000, Teacher as Practitioner. The practicum experience is in a public school guided by practicing K-12 faculty.

Phase IIIa/b: A two-semester sequence in the final year consists of pedagogy course work and fieldwork in the first semester. The second semester consists of a 16-week, full-time classroom experience. Field experiences are completed in districts that are members of the Wyoming School-University Partnership.

Graduate certificate teacher licensure program students must have a cumulative GPA of 2.750 or higher from UW or from another accredited college or university, in order to declare a major in Education. A valid Wyoming Substitute Teaching Permit will be required, which will also serve as an approved background check.

Teacher education programs in Music, Art, Physical Education and Health are offered in other colleges at UW.

Faculty in the College of Education

School of Counseling, Leadership, Advocacy, and Design

School Director: Peter Moran

Associate Professors:

KARA L. CARNES-HOLT, B.A. East Texas Baptist University 2000; M.S. Ed. Baylor University 2003; Ph.D. University of North Texas 2010; Associate Professor of Counselor Education 2016, 2010.

MICHAEL M. MORGAN, B.S. Brigham Young University 1993; M.S. Auburn University 1995; Ph.D. Purdue University 2003; Associate Professor of Counselor Education 2011, 2003.

W. REED SCULL, B.S. St. Louis University 1983; M.A. University of Nevada-Reno 1989; Ed.D. University of Arizona 1994; Associate Professor 2019.

DOROTHY JEAN YOCOM, B.A. Whitworth College 1978; M.S. University of Oregon 1980; Ph.D. Oregon State University 1991; Associate Professor of Special Education 1997, 1991.

Assistant Professors:

RICHARD CARTER, B.S. Western Carolina University 2010; M.S.E. 2012; Ph.D. University of Kansas 2016; Assistant Professor of Special Education 2017.

AMANDA DeDIEGO, B.S. University of North Georgia 2009; M.S. 2012; Ph.D. University of Tennessee 2016; Assistant Professor of Counselor Education 2016.

BARBARA HICKMAN, B.A. University of Minnesota 1985; B.S. University of Minnesota 1986; M.A. Saint Mary's College 1997; Ed.D. Northern Arizona University 2017; Assistant Professor 2019.

JIHYUN LEE, B.A. Daegu University 2006; M.Ed. Korea National University 2012; M.S. University of Wisconsin-Madison 2014; Ph.D. University of Texas-Austin 2018; Assistant Professor 2019.

COURTNEY McKIM, B.S. Boise State University 2006; Ph.D. University of Nebraska 2011; Assistant Professor of Educational Research 2011.

LAY-NAH BLUE MORRIS-HOWE, B.S. University of Wyoming 2004; M.S. 2007; Ph.D. 2011; Assistant Professor of Counselor Education 2015.

Associate Professional Lecturer:

TIFFANY HUNT, B.S. University of Wyoming 2001; M.S. University of Northern Colorado 2006; Assistant Professional Lecturer of Special Education 2014.

Professors Emeritus

Martin Agran, Mary Alice Bruce, John Cochennour, Ace Cossairt, Kay Cowie, Michael Day, Deborah McGriff, Alan Moore, Kay Persichitte, Suzanne Young.

School of Teacher Education

School Director: Alan Buss

Professors:

STEVEN M. BIALOSTOK, B.A. University of the Pacific 1975; M.S.W. California State University - Sacramento 1986; Ph.D. University of Arizona 1999; Professor of Elementary and Early Childhood Education 2015, 2000.

CYNTHIA BROCK, B.S. Oregon State University 1981; MEd Washington State University 1985; Ph.D. Michigan State University 1997; Wyoming Excellence in Education Literacy Chair 2015.

ANDREA C. BURROWS, B.S. University of Central Florida 1992; M.S. Florida State University 1994; Ed.D. University of Cincinnati 2011; Associate Professor of Secondary Education 2017, 2011.

ALAN R. BUSS, B.A. Brigham Young University 1989; M.A. 1993; Ph.D. University of Wyoming 1998; Associate Professor of Elementary and Early Childhood Education 2003, 1997.

SCOTT A. CHAMBERLIN, B.A. Purdue University 1989 and 1993; M.Ed. University of Utah 1998; Ph.D. Purdue University 2002; Professor of Elementary and Early Childhood Education 2015, 2003.

LEIGH HALL, B.S. University of South Florida 1996; M.Ed. Peabody College of Vanderbilt University 1997; Ph.D. Michigan State University 2005; Professor of Secondary Education 2017.

JOHN KAMUTU, B. A. University of Wyoming 1991; M. A. 1992; Ph.D. 1998; Professor of Educational Studies 2015, 1999.

RICHARD KITCHEN, B.A. University of Colorado-Denver 1984; M.A. University of Montana 1990; Ph.D. University of Wisconsin-Madison 1996; Professor of Secondary Education 2017.

JACQUELINE LEONARD, B.A. Saint Louis University 1981; M.A.T. University of Texas, Dallas 1991; M.T.S. Southern Methodist University 1994; Ph.D. University of Maryland at College Park 1997. Professor of Elementary and Early Childhood Education 2012.

PETER WILLIAM MORAN, B.A. University of Wyoming 1987; M.A. Kansas State University 1993; Ph.D. 2000; Professor of Elementary and Early Childhood Education 2017, 2001.

LESLIE S. RUSH, B.S. Texas A&M—Commerce 1984; M.Ed. 1996; Ph.D. University of Georgia, 2002; Professor of Secondary Education 2014, 2002. Associate Dean of Undergraduate Programs 2013.

TIMOTHY F. SLATER, B.S. Kansas State University 1989; B.S. Ed. 1989; M.S. Clemson University 1991; Ph.D. University of South Carolina 1993; Professor of Secondary Education 2008.

ALLEN TRENT, B.A. Eastern Kentucky University 1986; M.S. University of Dayton 1992; Ph.D. The Ohio State University 2000; Professor of Elementary and Early Childhood Education 2012.

Associate Professors:

TAO HAN, B.A. Sungshin Women's University, Korea 1984; M.A. University of Arizona 1993; M.A. University of Nevada-Reno 2002; Ph.D. 2006; Associate Professor of Elementary and Early Childhood Education 2016, 2010.

ANA HOUSEAL, B.A. University of Iowa 1985; M.A. University of Northern Iowa 1998; Ph.D. University of Illinois 2010; Associate Professor of Elementary and Early Childhood Education 2017, 2011.

LINDA HUTCHISON, B.A. Humboldt State University 1978; M.A. Stanford University 1986; Ph.D. University of Washington 1992; Associate Professor of Secondary Education 2000, 1993.

TRICIA JOHNSON, B.S. Lehigh University 1991; M.Ed. 1993; Ed.S. George Washington University 1997; Ed.D. Columbia University 2004; Associate Professor of Elementary and Early Childhood Education 2012.

STEVEN LOCKE, B.A. Indiana University 1985; M.S. Portland State University 1991; Ph.D. Indiana University 1997; Associate Professor of Elementary and Early Childhood Education 2005, 2001.

PATRICK MANYAK, B.A. Pepperdine University 1988; M.S. 1990; Ph.D. University of Southern California-Los Angeles 2001; Associate Professor of Elementary and Early Childhood Education 2007, 2001.

LYDIAH NGANGA, B.S. University of Wyoming 1998; M.S. 2000; Ph.D. 2005; Associate Professor of Elementary and Early Childhood Education 2011, 2005.

AMY ROBERTS, B.S. Indiana University 1986; M.A. Portland State University 1991; Ph.D. Indiana University 1996; Associate Professor of Elementary and Early Childhood Education 2004, 1998.

DANA ROBERTSON, B.A. Berklee College of Music 1996; M.Ed. University of Massachusetts 2001; Ed.D. Boston University 2012; Associate Professor of Elementary and Early Childhood Education 2019, 2012.

JENNA SHIM, B.A. California State University - Los Angeles 1994; M.M. Manhattan School of Music - New York 1996; M.S. State University of New York - Albany 2006; Ph.D. 2009; Associate Professor of Educational Studies 2016, 2010.

KATHERINE MUIR WELSH, B.A. University of California—Berkeley 1986; Single Subject Teaching Credential (Life Sciences) University of California—Santa Barbara 1990; Ph.D. University of California—Los Angeles 2002; Associate Professor of Elementary and Early Childhood Education 2008, 2002.

Assistant Professors:

ALI BICER, B.S. Celal Bayar University 2006; M.S. Texas A&M University 2012; Ph.D. 2016; Assistant Professor of Elementary and Early Childhood Education 2019.

JASON KATZMANN, B.S. Texas Women’s University 1994; M.A. Colorado College 2000; Ph.D. University of Northern Colorado 2007; Assistant Professor of Educational Studies 2016, 2007.

TODD REYNOLDS, B.A. University of Northern Colorado 1998; M.A. 2004; Ed.S. 2008; Ph.D. University of Wyoming 2015; Assistant Professor of Secondary Education 2019.

Senior Lecturers:

KIMBERLY GUSTAFSON, B.A. University of Wyoming 1998; M.A. 2003; Ed.D. 2010; Senior Lecturer of Elementary and Early Childhood Education 2019, 2007.

AMY SPIKER, B.A. University of Wyoming 1989; M.A. 2004; Senior Lecturer of Elementary and Early Childhood Education 2016, 2007.

Senior Lecturers:

NIKKI BALDWIN, B.A. University of Wyoming 1994; M.A. 2005; Associate Lecturer of Elementary and Early Childhood Education 2015, 2009.

ROD THOMPSON, B.A. University of Nebraska at Kearney 1991; M.A. University of Northern Iowa 1998; Associate Lecturer of Educational Studies 2019.

Assistant Lecturers:

LINDSEY FREEMAN, B.S. University of Wyoming 2011; M.A. 2018; Assistant Lecturer of Educational Studies 2019.

JENNIFER GERINGER, B.A. University of Texas - San Antonio 1991; M.S. University of Wyoming 1997; Ph.D. 2001; Assistant Lecturer of Elementary and Early Childhood Education 2015.

JANET LEAR, B.S. University of Wisconsin-Madison 1990; M.A. University of California, Berkeley 1998; Ph.D. University of Denver 2017; Assistant Lecturer of Educational Studies 2019.

ROCHELLE MCCOY, B.A. Western Governors University 2006; M.A. 2012; Assistant Lecturer of Elementary and Early Childhood Education 2019.

JOSEPH SCHROER, B.A. University of Cincinnati 2002; B.S. 2005; M.A. 2001; Ph.D. 2007; Assistant Lecturer of Educational Studies 2019.

Professors Emeritus:

Michelle Buchanan, Barbara A. Chatton, Margaret Cooney, Lydia Dambekalns, Judith Z. Ellsworth, Patricia McClurg, R. Timothy Rush

Admission to the B.A. and B.S. Programs in the College of Education

New first-time students who meet the University of Wyoming’s standards for admission may declare their major in Elementary Education, Secondary Education in a specific content area, or Education Undecided (EDUD), provided that they have a minimum ACT Composite score of 21 and an ACT Math score of 21 or a minimum new SAT combined score of 1060 with a minimum SAT Math score of 530. A lower ACT/SAT Math score can be replaced by a Math Placement Examination (MPE) score of 2 or higher. Education Undecided majors should decide on a specific content area no later than the first semester of their sophomore year.

All incoming students pursuing teacher certification and/or teacher endorsement programs must undergo an initial criminal background check prior to full admission to the College of Education. A second background check is included as part of the state application process for the Wyoming Substitute Teaching Permit, which is required for admission to Phase II and Phase III of the B.A. and B.S. programs.

For those students who do not meet the above admissions requirements, it is suggested that they major in exploratory studies (EXPL) so that they will receive more appropriate advising and access to support services through Advising, Career and Exploratory Studies until they have attained a minimum 2.750 UW grade point average (with at least 15 UW credits), and successfully complete an approved background check.

Current UW students who wish to change their major to Education but do not yet have a UW grade point average must wait until they meet the requirement of a minimum 2.750 UW grade point average, with at least 15 UW credits posted to their transcript. It is recommended that they complete a Program Change form and contact the Teacher Preparation and Advising Office in McWhinnie Hall, room 100 to initiate the background check process. Students’ progression through the Education curriculum could be delayed until all requirements are fulfilled and their major officially changed to Education.

Transfer students from out of state institutions, as well as from Wyoming community colleges wishing to declare a major in Education must have completed a minimum of 15 transferable credits, including the USP 2015 “Q” requirement (as determined by the UW Registrar), with a final grade higher than a C- to do so. Transfer students must have a minimum Transfer GPA of at least 2.750 and successfully complete an approved background check.

For transfer students not meeting these requirements, it is suggested that they major in exploratory studies (EXPL) so that they will receive more appropriate advising and access to support services through Advising, Career and Exploratory Studies until they meet requirement of a minimum 2.750 UW grade point average (with at least 15 UW credits), and successfully complete an approved background check.

Re-admitted students who return to UW after two or more semesters away, and wish to (re-)declare a major in Education, must have a minimum 2.750 UW GPA (with at least 15 UW credits) to do so and successfully complete an approved background check.

Academic Advising

Students are assigned an academic adviser who will assist in planning a program combining University Studies requirements, core content requirements, and professional education courses. Students are expected to consult with their adviser regularly. The Teacher Preparation and Advising Office coordinates advising and provides students and faculty with assistance in areas related to academic advising.

Degree Program Curricula

The following curricula summarize the programs offered by the College of Education. Students complete content courses in their major as well as professional education courses, some of which can also be counted toward their University Studies Program requirements. The University Studies Program requirements include:

Communication I (COM1).....	3
Communication II (COM2)	3
Communication III (COM3).....	3
First-Year Seminar (FYS).....	3
Human Culture (H)	6
Physical and Natural World (PN).....	6
Quantitative Reasoning (Q)	3
U.S. & Wyoming Constitutions (V).....	3

The minimum total credit hours required to complete a degree in Education is 120. Of the minimum credit hours required to complete a program, 42 credit hours must be completed at the upper division level (3000-level or higher), with 30 of those credits being completed at UW. Additional College of Education requirements are:

1. 2.750 UW Total Institution grade point average
2. 2.500 grade point average in the content courses required for each specific major
3. A valid Wyoming substitute teaching certificate

Further information on each program is available in:

Teacher Preparation and Advising Office
McWhinnie Hall room 100
Dept. 3374, 1000 E. University Ave.
Laramie, WY 82071
(307) 766-2230

Acceptability of Coursework

Courses taken to satisfy professional education requirements and major content requirements must be taken for a conventional grade (A-F) unless offered for S/U grading only.

Professional education courses taken prior to the last 10 years will not be accepted in a degree and/or teacher certification program.

The College of Education does not accept transfer credits for Professional Education or content area courses with equivalents at UW when the grade earned was less than a C. Please note that grades of C- will not satisfy this requirement. The College of Education does not accept either teaching methodology or student teaching coursework or credits completed at other colleges or universities.

Student Responsibility

College of Education students are responsible for knowing and meeting graduation requirements. Students are expected to maintain a 2.750 UW Total Institution grade point average to enter Phases II and III and continue in the professional education sequence and to graduate. Prior to enrolling in professional education courses, students are expected to have met the specific program and course prerequisites as listed in this publication. Students are expected to make reasonable academic progress toward completion of a degree.

Teaching Endorsements

A teaching endorsement is not a stand-alone teacher certification program. Endorsements are issued by the Wyoming Professional Teaching Standards Board (PTSB) to state-licensed Elementary (K-6) and Secondary (6-12) teachers qualified to teach in specific subject areas, in addition to their initial certification(s).

Agricultural Education Curriculum

The agricultural education program consists of a minimum of 120 credit hours and prepares students for grades 6-12 licensure to teach agriculture. Students must earn one of the concurrent majors below. A minimum GPA of 2.500 in major content courses is required, with no course having a grade below C.

Professional Education Requirements

EDST	2450	.....3
ITEC	2360	.....3
EDEX	2484	.....3
EDST	2480	.....4
EDST	3000	.....6
EDST	3550	.....2
EDSE	3278	.....3
EDSE	4278	.....4
EDSE	4500	.....15

Agricultural Education with Concurrent Major in Animal and Veterinary Science, or Agricultural Business, or Agricultural Communications

This program consists of a minimum of 120 total hours. Minimum of 2.750 cumulative GPA and minimum of 2.500 content GPA required.

Agricultural Education Core Requirements: 47 hours

AGEC/ECON	1010 or 1020	.....3
AECL	1000	.....4
SOIL	2010	.....4
PLNT	2025	.....3
PLNT	2026	.....1
REWM	2000	.....3
ANSC	1010	.....4
ANSC	2020	.....4
LIFE	1010	.....4
LIFE	2122 or 2023	.....4
CHEM	1000 or 1020	.....4
EDAG	3160	.....3
EDAG	4170	.....3
EDAG	4180	.....3

Animal and Veterinary Science

Concurrent Major Content: 25 hours

ANSC	2010	.....3
ANSC	3010	.....4
15 credits from the following:		
ANSC	3100	.....3
ANSC	4120	.....3
ANSC	4540	.....3
FDSC	2040	.....3
FDSC	3060	.....3
PATB	4110	.....3
Plus:		
ANSC	4220 or 4230 or 4250	.....3

Agricultural Business Concurrent Major Content: 26 hours

AGEC	2020	.....4
AGEC	4050	.....3
ACEG	4060	.....3
AGEC	4500	.....3
ECON	3020	.....3
MATH	2350	.....4
AGEC upper division electives.....6		

Agricultural Communications

Concurrent Major Content: 28 hrs.

COJO	1000	.....3
COJO	1040	.....3
COJO	2010	.....3
COJO	2100	.....3
AGRI	4975	.....1
COJO upper division Journalism electives 9		
AG upper division Leadership electives.....6		

To add an endorsement in secondary Biology Education, these courses are required:

MICR/MOLB	2021	.....4
LIFE	3050 (preferred)	.....4
Or LIFE 3500 .....3		
LIFE	3400	.....3
EDSE	4279 or 3275	.....3
Upper division Biology related elective.....3		

Computer Science Endorsement

The College of Education offers courses that lead to an endorsement (grades 6-12) from the Wyoming Professional Teaching Standards Board in computer science. Students can also receive a minor in computer science; see information in the College of Engineering and Applied Science section of this catalog for more information about the computer science minor.

The endorsement consists of 20 credit hours including 5 upper division credits. It is recommended that students interested in obtaining the computer science minor apply to the program by their freshman year or the beginning of sophomore year. Students are encouraged to examine course prerequisites.

Required Courses (20 credits):

COSC 1010.....	4
COSC 1030.....	4
COSC 2030.....	4
COSC 2150.....	3
COSC 3050.....	1
COSC 3100.....	2
EDSE 4280.....	2

Elementary Education Curriculum

The elementary education program requires a minimum of 120 credit hours and prepares students to teach in grades K-6.

Professional Education Requirements

68 credits of specific courses are included under the Professional Education Requirements. Specific Professional Education coursework requirements for this degree program are in the process of being approved and will be added to the Elementary Education program sheet, available from the Teacher Preparation and Advising Office.

Major Content

36 credit hours of specific under Major Content must be completed prior to enrollment in EDEL 4109, 4309, 4409.

EDEL 2140.....	3
EDEL 2280.....	3
MATH 1100.....	3
MATH 1105.....	3
MATH 2120.....	3
ASTR/GEOL 1070.....	4
LIFE 1020.....	4
CHEM/PHYS1090.....	4
GEOG 1000 or GEOG 1020.....	3
Social studies elective, from HIST or POLS.....	3
EDEL 2170.....	3

Electives

10 credit hours of elective courses are required. Students are strongly encouraged to apply elective hours toward a minor. Available minors in the College of Education include Early Childhood Education; minors from outside the College of Education are also possible. Advisor assistance is strongly recommended when choosing a minor.

Elementary Education/Special Education Curriculum

This program consists of a minimum of 120 total hours.

Professional Education Requirements

EDST 2450.....	3
EDST 2480.....	4
EDEX 2484.....	3
ITEC 2360.....	3
EDST 3000.....	3
Special Education Assessment.....	3
EDEL 4109.....	5
EDEL 4309.....	5
EDEL 4409.....	5
EDEL 4500.....	8
EDEX 4500.....	8

Elementary Education Content

LIFE 1020.....	4
GEOL/ASTR 1070.....	4
PHYS 1090.....	4
MATH 1100.....	3
MATH 1105.....	3
MATH 2120.....	3
EDEL 2280.....	3
EDEL 4320.....	3
GEOG 1000 or 1020.....	3
EDEL 3170.....	3

Special Education Content: 36 (minimum) credit hours

The specific Special Education coursework requirements for this degree program are in the process of being approved, and will be added to the Elementary Education (K-6)/Special Education (K-12) program sheet. When complete, it will be available from the Teacher Preparation and Advising Office.

All major content courses must be taken prior to enrollment in EDEL 4109, 4309, 4409. EDST 3550 must also be completed before EDEL 4109, 4309, 4409.

English Education with Concurrent Major in English Curriculum

This program consists of a minimum of 120 total hours. All English courses must be passed with a grade of C or better. A minimum GPA of 2.500 in major content courses is required. A minimum of 21 credits in English must be upper-division.

Professional Education Requirements

EDST 2450.....	3
EDST 2480.....	4
EDEX 2484.....	3
ITEC 2360.....	3
EDST 3000.....	6
EDST 3550.....	2
EDSE 3270.....	3
EDSE 4270.....	4
EDSE 4500.....	15

Major Content

ENGL 2025.....	3
Choose one:	
ENGL 2340; ENGL 2350; ENGL 2360, ENGL 2425, ENGL 2430, ENGL 2435.....	3
Choose three:	
ENGL 3200.....	3
ENGL 3300.....	3
ENGL 3400.....	3
ENGL 3500.....	3
ENGL 3600.....	3
Literature credits examining diversity-related issues, 2000-level or above.....	6
ENGL 3010.....	3
EDCI 4761 or EDCI 4762 or ANTH 2000..	3
Elective credits from the approved Rhetoric/Composition/Professional Writing list.....	6
ENGL 4999.....	3
EDCI 4120.....	3
Credits in a single World Language, or in American Sign Language.....	12

Mathematics Education with Concurrent Major in Mathematics Curriculum

The mathematics education program requires a minimum of 120 credit hours and prepares students to teach mathematics in grades 6-12.

Professional Education Requirements

EDST 2450.....	3
EDST 2480.....	4
EDEX 2484.....	3
ITEC 2360.....	3
EDST 3000.....	6
EDST 3550.....	2
EDSE 3271.....	3
EDSE 4271.....	4
EDSE 4500.....	15

Major Content

It is necessary to complete a minimum of 50 hours in math coursework. Work must include 27 credit hours of upper-division mathematics. The grade in each course of this 50-hour requirement must be C or better. A minimum GPA of 2.500 in major content courses is required.

MATH 2200.....	4
MATH 2205.....	4
MATH 2210.....	4
MATH 2310.....	3
MATH 2250.....	3
MATH 2800.....	2
MATH 3500.....	3
MATH 3340.....	3
MATH 3205.....	3

MATH 46003
 MATH 40003
 MATH 4510 and 4520 or
 MATH 4340 and 4440 or
 MATH 4200 and 4205.....6

Two of the following:

MATH 3700.....3
 MATH 4130.....3
 MATH 4230.....3
 MATH 4255.....3
 MATH 4265.....3
 MATH 4300.....3
 MATH 4500.....3
 Statistics Requirement3-4

Choose one:

STAT 20003
 STAT 2050.....4
 STAT 2070.....4
 STAT 3050.....3

Modern Languages Education

Secondary education programs are offered in French, German, and Spanish. Total minimum hours required for the modern languages education curriculum is 120 credits.

Modern Language Secondary Education programs require that all candidates score at the *Advanced Low* level or higher on the American Council of Teachers of Foreign Language Oral Proficiency Interview (OPI), as well as on the Writing Proficiency Test (WPT) in their target language. In order to be admitted to the Methods II course, students must demonstrate having attained a rating of at least the *Advanced Low* proficiency level on the OPI and the WPT. Given these requirements, it is important that students take advantage of study abroad experiences that will assist them in reaching high levels of second language proficiency. For information on UW study abroad opportunities, contact the International Programs office at 766-3677, or consult their web site at www.uwyo.edu/geo.

Professional Education Requirements

EDST 2450.....3
 EDST 2480.....4
 EDEX 2484.....3
 ITEC 2360.....3
 EDST 3000.....6
 EDST 3550.....2
 EDSE 3276.....3
 EDSE 4276.....4
 EDSE 4500.....15

With Concurrent Major in French

The major consists of at least 42 hours beyond FREN 2030. Students who have taken French in high school should consult the Department of Modern and Classical Languages about proper placement. FREN 1010, 1020, and 2030 do not count toward the major; however, these courses may need to be taken as prerequisites.

French Major Content

FREN 2040.....3
 FREN 2140.....3
 FREN 3005.....3
 FREN 3050.....3
 FREN 3060.....3
 FREN elective (above 2030)15

Other Required Courses

COJO 2010 or THEA 11003
 EDCI 4761 or EDCI 47623
 EDCI 4350.....3
 EDCI 4450.....3

and
 French (FREN) or courses related to the history, art and political science of the francophone world, in consultation with your academic adviser. [In addition to other required course work.] For those who wish to complete the ESL Endorsement, six of these hours can be earned by taking EDCI 5430 and EDCI 5440, or through study abroad in a French-speaking country 12

With Concurrent Major in German

The major consists of at least 42 hours beyond GERM 2030. Students who have taken German in high school should consult the Department of Modern and Classical Languages about proper placement. GERM 1010, 1020, and 2030 do not count toward the major; however, these courses may need to be taken as prerequisites.

GERM 2040.....3
 GERM 3050.....3
 GERM 3060.....3
 GERM elective (above 2030) 21

Other Required Courses

COJO 2010 or THEA 11003
 EDCI 4761 or EDCI 47623
 EDCI 4350.....3
 EDCI 4450.....3

and
 German (GERM) or courses related to the

history, art and political science of the German-speaking world, in consultation with your academic adviser. [In addition to other required course work.] For those who wish to complete the ESL Endorsement, six of these hours can be earned by taking EDCI 5430 and EDCI 5440, or through study abroad in a German-speaking country..... 12

With Concurrent Major in Spanish

The major consists of at least 42 hours beyond SPAN 2030. Students who have taken Spanish in high school should consult the Department of Modern and Classical Languages about proper placement. SPAN 1010, 1020, and 2030 do not count toward the major; however, these courses may need to be taken as prerequisites.

SPAN 2040.....3
 SPAN 3050 or 3030.....3
 SPAN 3060.....3
 SPAN 3140.....3
 SPAN 4080.....3
 SPAN 3300.....3
 SPAN electives (above 3000)..... 12

Other Required Courses

COJO 2010 or THEA 11003
 EDCI 4761 or EDCI 47623
 EDCI 4350.....3
 EDCI 4450.....3

and
 Spanish (SPAN) or courses related to the history, art and political science of the Spanish-speaking world, in consultation with your academic adviser. [In addition to other required course work.] For those who wish to complete the ESL Endorsement, six of these hours can be earned by taking EDCI 5430 and EDCI 5440, or through study abroad in a Spanish-speaking country..... 12

Science Education Curriculum

Concurrent majors in Science Education are offered in Biology, Chemistry, Environmental System Science, Geology, and Physics.

A grade of C or better must be earned in each course included in the major content. A minimum GPA of 2.500 in major content courses is required.

Professional Education Requirements

EDST 2450.....	3
EDST 2480.....	4
EDEX 2484.....	3
ITEC 2360.....	3
EDST 3000.....	6
EDST 3550.....	2
EDSE 3275.....	3
EDSE 4275.....	4
EDSE 4500.....	15

Biological Science Education with Concurrent Major in Biology

Total minimum program hours: 120

In addition to the professional education requirements, a minimum of 70 semester hours, including the major content courses (26 hours), biology electives (9 hours) and required electives (35 hours minimum).

Science Electives

At least one course from each of the following areas is required: chemistry, physics, environmental science, earth and space sciences.

Major Content

Required Courses

LIFE 1010.....	4
LIFE 3400.....	3
LIFE 3050.....	4
LIFE 3500.....	3
LIFE 3600.....	4

Plus choose two:

LIFE 2022.....	4
LIFE 2023.....	4
MICR/MOLB 2021.....	4

Elective Courses

9 hours in the Biological Sciences. Electives may be from one or more of these areas of emphasis: Microbial Emphasis; Plant and Fungal Emphasis; Animal Emphasis; Ecology Emphasis; Genetics and Evolution Emphasis (choices available from the Teacher Preparation and Advising Office or the college web site). A minimum of 6 hours must be upper division.

Other Required Electives (20 hours minimum)

CHEM 1020.....	4
CHEM 2300.....	4
MICR/MOLB 3610.....	4
PHYS 1110.....	4
PHYS 1120.....	4
MATH 2200.....	4
STAT 2050 OR LIFE 2100.....	4
COSC 1010 or COSC 1030 or LIFE 2100.....	4
Earth/Space Science.....	3-4

Chemistry Education with Concurrent Major in Chemistry

Total minimum program hours: 120

In addition to the professional education requirements, a minimum of 65 semester hours, including the major content courses (31 hours), science electives (6 hours), and required electives (28 hours minimum).

Required Content Courses

CHEM 1020 or 1050.....	4
CHEM 1030 or 1060.....	4
CHEM 2230 or 4230.....	5
CHEM 2420.....	4
CHEM 2440.....	4
CHEM 4110.....	3
CHEM 4100.....	4
CHEM 4440 or MOLB 3610.....	3-4
CHEM 4507 or 3550.....	3
LIFE 1010.....	4
MATH 2200.....	4
MATH 2205.....	4
MOLB/MICR 2021.....	4
PHYS 1110 or 1210.....	4
PHYS 1120 or 1220.....	4
STAT 2050.....	4

Minimum 6 Additional Credits from:

Any upper division (3000-level or higher)
CHEM, LIFE, MOLB course.....6

Earth Science Education with Concurrent Major in Environmental Systems Science

Total minimum program hours: 120

In addition to the professional education requirements, a minimum of 56 semester hours, including the major content courses, additional courses, and elective courses are required.

Foundations

ESS 1000.....	2
ENR 1200 or LIFE 1010.....	4
ENR/GEOL 1500 or GEOG 1010 or GEOL 1100.....	4

Foundations of Physical Science

PHYS 1110.....	4
CHEM 1020.....	4
CHEM 1030.....	4
ESS/GEOL 2000.....	4

Spheres

ANTH/ENR 4310 or ENR/GEOG 4040.....	3
ATSC 2100 or GEOG 3450 or GEOL 3500.....	3-4
LIFE 2022 and/or LIFE 2023 and/or LIFE 3400 and/or MICR/MOLB 2021 and/or GEOG 4460.....	6-8

Lithosphere

GEOG 3480 or GEOL 3500.....	3-4
GEOL 2150 or GEOG 3010 or REWM/ENR 4285 or GEOG 4450.....	3-4

Skills & Tools

MATH 2200.....	4
ENR/GEOL 4525 or ENR 4500.....	3-4
GEOG 2150 or BOT/GEOG 3150 or BOT/GEOG 4111 or GEOG 4200.....	3-4
ESS 4970: Internship (met through successful completion of Residency in Teaching: EDSE 4500)	

Earth Science Education with Concurrent Major in Geology

Total minimum program hours: 120

In addition to the professional education requirements, a minimum of 64 semester hours, including the major content courses (30 hours), required electives (15 hours) and elective courses in one Emphasis Area (18 hours) are required.

Required Geology Courses

GEOL 1100 or 1500.....	4
GEOL 2000.....	4
GEOL 2010.....	3
GEOL 2020.....	2
GEOL 2100.....	4
GEOL 2080 or 4717.....	3-6
GEOL 4820.....	3

Required Electives

LIFE 1010.....	4
CHEM 1020.....	4
PHYS 1110.....	4
STAT 2050.....	4
MATH 1405 or 1450.....	3-5
ASTR 1050.....	4

Elective Courses: 6 courses from the following recommended list

ATSC 2000 or GEOG 3450.....	3-4
GEOL 2050.....	3
GEOL 2070.....	4
GEOL 2005 or 3005.....	4
GEOL 3400.....	4
GEOL 3500*.....	4
GEOL 3600.....	4
GEOL 4444.....	4
GEOL 4490.....	3
GEOL 4610.....	4
GEOL 4835.....	3
ECON 2400.....	3
GEOG 3010.....	3
POLS 4051.....	3
SOIL 4120.....	4
ECON 4400.....	3
ECON 4410.....	3

*Highly recommended.

Physics Education with Concurrent Major in Physics

Total minimum program hours: 120

In addition to the professional education requirements, a minimum of 63 semester hours, including the major content courses (32 hours), and science (16 hours), and mathematics (15 hours) courses are required.

Major Content

Required Courses

PHYS 1210 or 1310.....4
 PHYS 1220 or 1320.....4
 ASTR 2310 or 2320 or
 PHYS 2310 or 3640.....4
 PHYS 2320.....4
 PHYS 4210.....3
 PHYS 4310 or ASTR 4610.....3
 PHYS 4410.....3
 PHYS 4510.....3
 PHYS elective, 2000-level or higher**.....2
 Upper division PHYS elective.....3

Notes: Credit can only be earned with the following combinations as options for PHYS 2310: ASTR 1050 and ASTR 2320 or ASTR 1000 and ASTR 2310.

**We encourage students to apply to become Supplemental Instruction (SI) teachers to fulfill the PHYS 2000-level or higher elective. Students must have successfully completed the course for which they would like to lead the SI group, and they must contact the instructor of the course regarding this option in advance of contacting the SI program coordinator.

Required Science Courses

LIFE 1010.....4
 CHEM 1020.....4
 ASTR 1000 or 1050.....3-4
 COSC 1010 or 1030 or PHYS 3000.....4

Required Mathematics Courses

MATH 2200.....4
 MATH 2205.....4
 MATH 2210.....4
 MATH 2310.....3

Endorsements to Teach Additional Science Subjects

By state statute, the University of Wyoming's College of Education is allowed to provide institutional recommendations for add-on endorsements in Biology, Chemistry, Earth Science, and Physics to those who have completed programs leading to licensure in secondary-level Science content areas.

Biology Endorsement - 24 hrs. minimum

LIFE 1010.....4
 LIFE 2022.....4
 LIFE 2023 or LIFE 3600 or other BOT/
 ZOO at the 3000/4000 level.....3-4

LIFE 3400.....3
 LIFE 3050.....3
 MICR/MOLB 2021.....4
 BOT/LIFE/MOLB/MICR/SOIL/ZOO at
 3000/4000 level.....3
 EDSE 3275.....3
 EDSE 4275.....4

Chemistry Endorsement - 24 hrs. minimum

CHEM 1020.....4
 CHEM 2420.....4
 CHEM 4110.....3
 MOLB 3610 or MOLB 4100 or GEOL 4777
 or BOT 4780 or SOIL 4535.....3-4
 CHEM 3550 or 4507.....3
 CHEM 2230 or 4230.....5
 EDSE 3275.....3
 EDSE 4275.....4

Earth Science Endorsement - 24 hrs. minimum

LIFE 1010.....4
 CHEM 1020.....4
 GEOL 2000.....4
 PHYS 1110.....4
 LIFE 2022 or LIFE 2023.....4
 ESS/GEOG 3480 or GEOL 3500 or BOT
 4780 or SOIL 4353 or ESS/ATSC/BOT/
 GEOL 4001 or BOT/GEOG 4111.....3-4
 EDSE 3275.....3
 EDSE 4275.....4

Physics Endorsement - 24 hrs. minimum

PHYS 1310.....4
 PHYS 1320.....4
 PHYS 2310.....3
 PHYS 2320.....3
 PHYS 4410.....3
 PHYS 4510.....3
 EDSE 3275.....3
 EDSE 4275.....4

Social Studies Education Professional Education Requirements

EDST 2450.....3
 EDST 2480.....4
 EDEX 2484.....3
 ITEC 2360.....3
 EDST 3000.....6
 EDST 3550.....2
 EDSE 3273.....3
 EDSE 4273.....4
 EDSE 4500.....15

Major Content

Concurrent majors in social studies education are offered in History (120 minimum credits total), and Political Science (120 minimum credits total).

Majors must maintain a G.P.A. of 2.500 in major content courses and earn a grade of C or better in all content classes.

Social Studies Education with Concurrent Major in History History Core Requirements - 36 credit hours minimum

HIST 1211.....3
 HIST 1221.....3
 HIST 1251.....3
 HIST 1110 or 1320.....3
 HIST 1120 or 1330.....3
 HIST 2000 level and above elective.....3
 HIST 3020.....3
 Native American content course
 (NAIS/HIST).....3
 3000 or 4000-level HIST electives..... 12
 MUST include a minimum: 6 hours of non-
 U.S. history and 6 hours of U.S. history

Required Additional Content - 27 credit hours minimum

GEOG 1010.....4
 GEOG 1000 or 1020.....3
 POLS 1000.....3
 ECON elective.....3
 PSYC elective.....3
 SOC or ANTH elective.....3
 Single foreign language.....8

Social Studies Education with Concurrent Major in Political Science Political Science Core Requirements - 33 credit hours minimum

POLS 1000.....3
 POLS 1200 or 1250.....3
 POLS 2310.....3
 POLS 2460 or 3600.....3
 POLS 48XX.....3
 POLS electives.....18
 At least 9 hours of the 18 total must be 3000
 or 4000-level
 At least 6 hours of the 18 total must be
 related to the U.S. Constitution
 STAT 2070.....4

Required Additional Content - 36 credit hours minimum

HIST 1211.....3
 HIST 1221.....3
 HIST 1110 or 1320.....3
 HIST 1120 or 1330.....3
 GEOG 1010.....4
 GEOG 1000 or 1020.....3
 ECON elective.....3
 PSYC elective.....3
 SOC or ANTH elective.....3
 Single foreign language.....8

Technical Education

This program consists of a minimum of 120 total hours. Minimum of 2.750 cumulative GPA and minimum of 2.500 content GPA required. This major will be advised at UW-Casper in the University Union building on the Casper College campus. Refer to UW-Casper or UW College of Education for specific curriculum requirements.

Professional Education Requirements

EDST 2450.....	3
EDST 2480.....	4
EDEX 2484.....	3
ITEC 2360.....	3
EDST 3000.....	6
EDSE 3010.....	3
EDST 3550.....	2
EDSE 3277.....	3
EDSE 4277.....	3
EDSE 3020.....	3
EDSE 4500.....	15

Major Content

Communications	10.5
ENTK 1510.....	3.5
ENTK 2510.....	4
EDSE 3050.....	3

Manufacturing	13
WELD 1700.....	2.5
WELD 1820.....	2.5
MCHT 2780 or 2790.....	4
EDSE 3610.....	4

Power/Energy & Transportation	13
ELTR 1570.....	4
ELTR 1620.....	1.5
ELTR 1760.....	4.5
EDSE 3040.....	3

Construction	7
CNTK 1860.....	3
EDSE 3030.....	3

Additional Content	8
STAT 2050 or 2070.....	4
PHYS 1050, 1110 or 1210.....	4

Areas of Concentration

Automotive	8-10
AUTO 1510.....	5
AUTO 1680 or 1690.....	3
AUTO 2610.....	5

Communications	12
ART 2100.....	3
CO/M 1505.....	3
CO/M 2190.....	3
CO/M 2410.....	3

Drafting **8**

ENTK 1650.....	4
ENTK 1710.....	4

Electronics **8.5-9.5**

ELTR 1700.....	5
ELTR 1710 or 2920.....	4.5 or 3.5

Manufacturing **6 or more**

MCHT 1610.....	2
MCHT 1620.....	2
ENTK 2800.....	4

Welding **8.5**

WELD 1910.....	3
WELD 2670.....	2.5
WELD 2680.....	3

Woodworking **3**

CNTK 1630.....	2
CNTK 1640.....	1

Minors

Early Childhood Minor

The minor consists of 22 credit hours including 9 hours of upper division credit. It is recommended that students interested in obtaining the early childhood minor apply to the program by the freshman year or the beginning of the sophomore year by completing the Program Change form, which may be found at http://www.uwyo.edu/registrar/students/forms_and_petitions.html.

Required courses (22 credits):

- EDEC 1020: Introduction to Early Childhood Education (3 credits)
- FCSC 2121: Child Development (4 credits) or PSYC 2300 and FCSC 2122 (4 credits)
- EDEC 2000: Engaging Families in Early Childhood Settings (3 credits)
- EDEL 2275: Literature for Young Children (3 credits) or EDEL 2280: Literature for Children (3 credits)
- EDEC 3000: Observing Young Children (3 credits)
- EDEC 3220: School Programs for Young Children (3 credits)
- EDEC 4320: Oral and Written Language Acquisition (3 credits)

Early Childhood Endorsement Programs

There are three early childhood endorsement programs available for students:

- The B-8 endorsement program for elementary education majors;
- The B-5 endorsement program for Family and Consumer Sciences/ Child Development option majors (or majors in other fields related to early childhood);
- The B-5 early childhood special education program for post-baccalaureate students with a degree in education or a field related to early childhood.

In addition, undergraduate education majors may choose early childhood education as an 18 credit hour area of concentration. Specific advising in each of the early childhood program options support students in their program development.

Graduate Study

The two schools of the College of Education provide support for master's and doctoral degree programs as well as graduate certificates. Faculty and staff work to deliver these programs by providing campus-based courses, courses taught through video conferencing, courses taught on-site at different locations in Wyoming, courses taught online, and courses taught in hybrid formats.

The College of Education is dedicated to offering high quality graduate programs that will provide students with the necessary skills to become educational leaders within their areas of specialization and expertise. All graduate students in the College of Education are expected to become scholars, researchers, and practitioners. They must, therefore, be knowledgeable about the ever-changing literature and research in education, the characteristics and needs of learners, and methods for facilitating learning. They must also understand the process of change and how to facilitate changes in learning settings that reflect what is known about the teaching/learning process. These skills are important to all graduate students, regardless of their areas of specialization or major emphasis.

Degree Programs

College of Education programs fall under one of the following university approved graduate certificate titles:

Master of Arts
 Master of Science
 Master of Science in Counseling
 Doctor of Education (Ed.D)
 Ph.D. in Education
 Ph.D. in Counselor Education
 and Supervision
 Ph.D. in Curriculum and Instruction

The schools in the college are approved to offer one or more of the above listed degrees with specialization in their particular areas. The specializations available are:

Counselor Education (Counselor
 Education and Supervision,
 Mental Health Counseling,
 and School Counseling)
 Curriculum Studies
 Curriculum and Instruction
 Higher Education Administration
 Educational Leadership
 Learning, Design, and Technology
 Literacy Education
 Mathematics Education
 Science Education
 Special Education

Master's Programs

There are three master's programs in the College of Education and two of the three have additional specialization areas. They are designed to provide advanced study for educational professionals. Consult each school (School of Teacher Education and School of Counseling, Leadership, Advocacy, and Design) for program requirements and expectations.

Doctoral Programs

Doctor of Education (Ed.D.)

The College of Education Ed.D. program prepares students for scholarly inquiry and professional leadership in education. The program consists of (1) applied research, (2) courses and professional experiences in education and related fields designed to develop a comprehensive academic basis for leadership roles in education, and (3) applied professional experiences tailored to individual needs and career goals. Each student works closely with an adviser and a supervisory faculty committee to select courses, topics of research, and professional opportunities.

Preparation in the above areas combine to:

Convey deep scholarly knowledge of education and foster its application in practice;
 Promote a broad understanding of various methods of inquiry in education and foster its application in practice settings;
 Advocate practices that demonstrate a commitment to diversity in education;
 Foster ethical and professional research and practice in education;
 Promote excellence in applied professional practice.

The degree of Doctor of Education (Ed.D.) is offered to competent students who wish to pursue a program of study and to participate in appropriate activities in preparation for professional service and leadership in education. The program is designed to meet the needs of those for whom intensive research is not a practical prerequisite to professional goals. Doctoral students are expected to participate not only in organized coursework but also in other activities that will ensure breadth of outlook and technical competence.

Options in the Ed.D. are:
 Curriculum and Instruction
 Higher Education Administration
 Educational Leadership
 Learning, Design, and Technology

Ph.D. in Education and Ph.D. in Curriculum and Instruction

The College of Education Ph.D. program prepares students for careers of scholarly inquiry and teaching in higher education. The program consists of (1) continuous research or inquiry, (2) courses and professional experiences in education and related fields designed to develop a comprehensive academic basis for future work in research and teaching, and (3) teaching and other related experiences tailored to individual needs and career goals. Each student works closely with an adviser and a supervisory faculty committee to select courses, topics of research and inquiry, and teaching experiences.

All coursework in the Ph.D. in Education program addresses the following goals:

To convey deep scholarly knowledge of education and related fields
 To promote a broad understanding of various methods of inquiry in education and develop competency in several of those methods
 To advocate practices that demonstrate a commitment to diversity in education
 To foster ethical and professional research and practice in education

To promote excellence as a college teacher

Effective preparation for the Ph.D. stems from collaborative research and inquiry into topics of mutual interest by students and faculty scholars/researchers. A major portion of the program consists of the individual student and selected faculty members(s) jointly engaged in research and inquiry. Successful Ph.D. applicants tend to have high aptitude for research and inquiry and express interest in general topics which the faculty of the college are actively inquiring and researching.

Options in the Ph.D. in Education are:
 Educational Leadership
 Higher Education Administration
 Learning, Design, and Technology

Options in the Ph.D. in Curriculum and Instruction are:
 Curriculum Studies
 Literacy Education
 Mathematics Education
 Science Education

Ph.D. in Counselor Education and Supervision

The PhD program in Counselor Education and Supervision is CACREP accredited and prepares professionals for positions as faculty in Counselor Education departments through personalized, developmentally oriented coursework emphasizing the integration of theory and experiential learning. This doctoral program is ideal for self-initiating persons who thrive in an atmosphere supportive of faculty/student interactions, small class environments, intensive class discussions and opportunities for self-direction and scholarly activity. The doctoral program is built upon the basis of a strong Master's program and upholds the philosophical orientations, coherent principles, and applied knowledge and skills as counselors and supervisors.

The doctoral degree program is 60 credit hours for individuals who have completed a 60-hour CACREP master's program. Students with a 48-hour CACREP master's degree are required to complete an additional 12 semester credits. Students, through coursework, practica and faculty guidance, develop competencies in the areas of counseling, supervision, teaching, leadership, advocacy, research and scholarship.

Learner Outcomes

Doctoral Students in the Counselor Education and Supervision will demonstrate the following learner outcomes.

1. **Academic and Professional Goals:** Students will demonstrate a clear vision of their professional and academic goals and academic preparation by developing and completing an approved program of study that meets the standards set forth by the Council for Accreditation of Counseling and Related Educational Programs (CACREP).
2. **Professional Licensure:** Students will obtain professional licensure as a Licensed Professional Counselor (LPC) in the state of Wyoming and/or develop a plan to obtain licensure for the state in which they intend to relocate upon graduation.
3. **Democratic Perspectives:** Students will demonstrate development as a culturally competent, creative, skilled & ethical counselor, supervisor and educator including the areas of advocacy, leadership, social justice, and promotion of caring communities.
4. **Research and Scholarship:** Students will develop a professional identity as an academic researcher by demonstrating a clear and active research agenda that includes a plan of action for professional presentations and manuscripts.
5. **Professional Development:** Students will develop a clear and diligent plan to becoming a skilled, ethically competent counselor educator.

Curriculum and Instruction Graduate Programs

The Program

The M.A. and Ed.D. in education with an option in curriculum and instruction are offered by the School of Teacher Education in the College of Education. A Ph.D. in curriculum and instruction is also being offered through the School of Teacher Education. These degree programs consist of required courses in curriculum and in research with a choice of electives chosen for their curricular emphasis. A graduate student in curriculum and instruction may choose a curricular emphasis in any of the following areas: early childhood education, early childhood special education, and English as a Second Language (ESL). Other content areas of emphasis are available through the College of Arts and Sciences.

Educators wishing to broaden their theoretical understanding of curriculum and instruction, to increase their knowledge and skills in their content specializations, to pursue additional endorsements, and to develop new strategies and materials for their classrooms should consider the Master of Arts in Education, with a concentration in Curriculum and Instruction. Educators wishing to pursue advanced graduate level study with a school-based, practitioner-oriented focus should consider the Doctorate of Education, with a concentration in Curriculum and Instruction. Educators interested in engaging more intently on educational research and in pursuing a career in higher education should consider the Doctorate of Philosophy in Curriculum and Instruction, with a concentration in Curriculum Studies, Literacy, Mathematics, or Science Education. Successful completion of any of these programs contributes to the professional development of educators and prepares them for roles of leadership within their subject areas, schools and/or higher education institutions.

The website for Curriculum and Instruction can be found at: www.uwyo.edu/ste/curriculum-instruction/

For more information about any of the Curriculum and Instruction program offerings, please contact a School of Teacher Education Office Associate at: (307) 766-6371 or curriculum@uwyo.edu.

Program Specific Degree Requirements Master of Arts in Education, Option: Curriculum and Instruction

- Minimum of 32 hours of graduate credit
- Many courses delivered using distance technologies
- Core Courses: 16 hours of program area core graduate credits
- Concentration: 15+ hours in either a certificate or endorsement program, academic content area, or general curriculum and instruction area of interest (with direction and consent of faculty adviser)
- Capstone consisting of one of the following:
 - o Plan A (thesis) – EDCI 5960: Thesis Research (4 graduate credits)
 - o Plan B (non-thesis) - EDCI 5090: Plan B Research (2 graduate credits)
 - o National Board Certificate – EDCI 5890: Directed Professional Study (1 graduate credit) and/or EDCI 5515 NBC Seminar

C&I Program Core:

- Classroom Assessment (EDCI 5500, 3 credits)
- Principles of Curriculum (EDCI 5000, 3 credits)
- Issues in Multicultural Education (EDCI 5450, 3 credits)
- Learning Theories and Instructional Principles (EDCI 5790, 3 credits)
- Action Research (EDRE 5550, 3 credits) OR Intro to Research (EDRE 5530, 3 credits)
- Midpoint Portfolio (EDCI 5400, 1 credit)

Areas of Concentration

- Certificates or Endorsements
 - o Early Childhood Special Education (see www.uwyo.edu/ste/early-childhood-education/early-childhood-special-education.html)
 - o English as a Second Language (see www.uwyo.edu/ste/curriculum-instruction/english-second-language/)
 - o Literacy (see www.uwyo.edu/ste/elementary-education/endorsements/certificate-of-literacy.html)
- Content Studies – Math, History, Art, Music, Science, Teachers of American Indian Children
- Curriculum and Instruction Studies – focus on special education, educational leadership, diversity studies, counseling, instructional technology, etc.

Program Specific Admission Requirements

Applications for the Master of Arts degree in Education with an Area of Concentration in Curriculum and Instruction are reviewed for admission two times each year. To be considered for admission, applications must be completed and submitted by September 1st for spring semester admission, and February 1st for summer/fall admission. Incomplete applications will not be considered. International students are encouraged to apply a semester earlier to allow sufficient time for paperwork. All applications will be completed through the UW Admissions website: <http://www.uwyo.edu/admissions/apply.html>.

Applicants are required to submit the following materials:

- letter of intent;
- academic resume, including information about teaching experience;
- contact information for three references;
- TOEFL or IELTS scores (for international, non-native English speaking applicants); and
- college transcripts.

In order to be considered for admission, applicants must meet the following minimum requirements:

- Score of 3 or 4 on a letter of intent. This letter serves as a writing sample, and takes the place of GRE scores in the admission process;
- One year of P-12 teaching experience or its equivalent. This requirement may be waived for applicants who have been admitted to the Teaching Elementary School or the Teaching Secondary Content Graduate Certificate program. Such applicants will be considered for admission on a conditional basis, pending successful completion of the Teaching Elementary School or Teaching Secondary Content Graduate Certificate program;
- Minimum 3.000 GPA on a 4.000 scale on the applicant's most recent bachelor's degree from an accredited institution;
- International, non-native English speaking applicants must have a TOEFL score of 525 (paper-based), 197 (computer exam) or above or an IELTS score of at least 6.5.

Please see the Graduate Admissions and Graduate Student Regulations and Policies entries in the front section of the UW Catalog for more information.

Program Specific Degree Requirements Master of Arts in Education, Option: Curriculum and Instruction with an Emphasis in Teacher Certification

This program provides a student who has completed the TES or TSC Graduate Certificate the opportunity to earn a teaching licensure while taking hours that lead to a master's degree. Acceptance to the master's degree program is via application and contingent upon successful completion of the TES or TSC Graduate Certificate. Meeting requirements for the master's does not guarantee acceptance.

C&I Master's Core Requirements:

- Principles of Curriculum (EDCI 5000, 3 credits)
- Issues in Multicultural Education (EDCI 5450, 3 credits)
- Learning Theories and Instructional Principles (EDCI 5790, 3 credits)
- Action Research (EDRE 5550, 3 credits) OR Intro to Research (EDRE 5530, 3 credits)
- Midpoint Portfolio (EDCI 5400, 1 credit)
- Capstone consisting of one of the following:
 - o Plan A (thesis) - EDCI 5960: Thesis Research (4 credits)
 - o Plan B (non-thesis) - EDCI 5090: Plan B Research (2 credits) and EDCI 5XXX (elective, in consultation with adviser)
 - o National Board Certificate - EDCI 5890: Directed Professional Study (1-4 credits)

For more information, contact the Teacher Preparation and Advising Office or visit the web page (<http://www.uwyo.edu/st/post-baccalaureate/>)

Program Specific Degree Requirements Doctor of Education (Ed.D.) in Education, Option: Curriculum and Instruction

- 30 credits transferable (as part of master's) from UW or other accredited university
- EDRE 5530 Introduction to Research (or equivalent; required)
- Minimum of 80 graduate credit hours in the following:
 - o Core Courses (15 graduate credit hours)
 - o Cognate (Area of Interest) (18 graduate credit hours)
 - o Research (9-12 graduate credit hours)
 - o Practicum/Internship (2 graduate credit hours)
 - o Dissertation (6 graduate credit hours)

Core courses

- EDCI 5600 - Diversity in Education
- EDCI 5730 - Learning and Cognition
- EDAD 5720 Educational Leader as Change Agent
- EDAD 5650 - Educational Leader as Communicator
- EDRE 5660- Proposal Writing

Cognate courses and advanced courses (minimum of 18 credits)

- EDCI 5800 – Curriculum Development
- EDCI 5790 – Learning Theories and Instructional Principles
- An additional 12 credits (elective, in consultation with adviser and/or committee)

Advanced research courses (minimum of 9-12 credits)

- EDRE 5530 Introduction to Research
- Some combination of Educational Research courses (in consultation with adviser and/or committee)

Practicum/Internship

- EDCI 5580 - Internship (2 credits)

Dissertation Hours

- The required number of dissertation credits is a minimum of 6.
- Preliminary exam (after coursework is completed): Guidelines determined by program, school, or committee
- Problem-Based Dissertation or project (after preliminary exam): Guidelines determined by program, school, or committee

Notes:

These requirements for an Ed.D. in Education are minimum requirements only.

Program Specific Admission Requirements

Applications for the Doctor of Education (EdD) program with a concentration in Curriculum and Instruction are reviewed for admission in fall and spring semesters. All applications will be completed through the UW Admissions website: <http://www.uwyo.edu/admissions/apply.html>.

Applicants are required to submit the following supplemental material:

- Letter of intent describing academic goals, teaching experiences, and reasons for pursuing a doctoral degree at the University of Wyoming. This letter serves as a writing sample.
- Recent GRE scores.
- Three letters of recommendation, completed by an individual familiar with the applicant's academic performance, a current or recent supervisor, and/or a selected colleague and/or community member.
- Academic Resume/Curriculum Vitae
- Transcripts

- TOEFL/IELTS scores (for international, non-native English speaking applicants).

In order to be considered for admission, applicants must meet the following minimum requirements:

- Hold a Master's degree from an accredited institute of higher education.
- Score of "Proficient" or higher on a letter of intent describing academic goals, teaching experiences, and reasons for pursuing a doctoral degree at the University of Wyoming.
- Three (3) years of P-12 teaching experience or its equivalent.
- Minimum 3.000 GPA on a 4.000 scale on the applicant's bachelor's degree from an accredited institution, plus transcripts from all other schools attended.
- GRE minimum score of Verbal:153, Quantitative:144.
- TOEFL score of 540 (paper-based), 76 (internet exam) or IELTS score of 6.5 or above are required for international, non-native English speaking applicants.

Please see the Graduate Admissions and Graduate Student Regulations and Policies entries in the front section of the UW Catalog for more information.

Program Specific Graduate Assistantships

Applicants interested in a Graduate Assistantship must submit a graduate assistantship application to the College of Education Dean's Office.

Program Specific Degree Requirements Doctor of Philosophy (Ph.D.) in Curriculum and Instruction, Options in Curriculum Studies, Literacy Education, Mathematics Education, and Science Education

- Bachelor and master's degree required for admission
- 30 credits transferable (as part of master's) from UW or other accredited university
- Residency requirement: 1-2 consecutive full-time semesters on campus
- Minimum of 81 total credits required in the following areas:
 - Core Courses (9 graduate credit hours)
 - Cognate (Area of Interest) (18 graduate credit hours)

- Research (12-15 graduate credit hours)
- Dissertation (12 graduate credit hours)

Core courses (minimum of 9 credits)

All PhD option areas require PRST 5610, Intro to Doctoral Studies. In addition, doctoral students, with direction from their committees, will choose a minimum of two additional courses from the remaining five core courses:

- EDCI 5900 (Practicum in College Teaching)
- EDCI 5810 (Writing for Professional Publication)
- EDCI 5730 (Learning and Cognition)
- EDRE 5660 (Dissertation/Thesis Prospectus Writing)

We also understand that students may meet the requirements for the core content in other ways, such as a master's degree in an area that emphasizes coursework in diversity or multi-cultural education. Committees may determine that the requirements for additional course(s) have been met. However, Introduction to Doctoral Studies may not be waived.

Cognate courses and advanced courses (minimum of 18 credits)

- EDCI 5600 (Diversity in Education)
- EDCI 5730 (Learning and Cognition)
- EDCI XXXX (Elective, in consultation with adviser and/or committee)
- 9 additional hours in some area of advanced area of study

Advanced research courses (minimum of 15 credits)

- EDRE 5530 (Introduction to Research) (may have been met in master's program)
- Some Combination of Educational Research courses (in consultation with adviser and/or committee)

Dissertation Hours

- The required number of dissertation credits is a minimum of 12.
- Preliminary exam (after coursework is completed): Guidelines determined by program, school, or committee
- Dissertation (after preliminary exam): Guidelines determined by program, school, or committee

Notes:

These requirements for a PhD in Curriculum and Instruction are minimum requirements only.

Program Specific Admission Requirements

Applications for the Doctor of Philosophy (PhD) program in Curriculum and Instruction with a concentration in Curriculum Studies are reviewed for admission in fall and spring semesters. All applications will be completed through the UW Admissions website: <http://www.uwyo.edu/admissions/apply.html>.

Applicants are required to submit the following materials:

- Letter of intent;
- Recent GRE scores, current within the last five years;
- Three letters of recommendation;
- Academic Resume/Curriculum Vitae, including information about teaching experience;
- Transcripts;
- TOEFL scores (for international, non-native English speaking applicants).

In order to be considered for admission, applicants must meet the following minimum requirements:

- Hold a Master's degree from an accredited institute of higher education.
- Score of "Proficient" or higher on a letter of intent describing academic goals, teaching experiences, and reasons for pursuing a doctoral degree at the University of Wyoming. This letter serves as a writing sample.
- Three (3) years of P-12 teaching experience or its equivalent.
- Minimum 3.000 GPA on a 4.000 scale on the applicant's most recent degree from an accredited institution, plus transcripts from all other schools attended.
- GRE minimum score of Verbal:153, Quantitative:144.
- TOEFL score of 540 (paper-based), 76 (internet exam) or IELTS score of 6.5 or above are required for international, non-native English speaking applicants.

Please see the Graduate Admissions and Graduate Student Regulations and Policies entries in the front section of the UW Catalog for more information.

Applications for the Doctor of Philosophy (PhD) program in Curriculum and Instruction with a concentration in Literacy Education are reviewed for admission in fall and spring semesters. All applications will be completed through the UW Admissions website: <http://www.uwyo.edu/admissions/apply.html>.

Applicants are required to submit the following materials:

- Current resume or vita;
- A detailed letter that expresses why the applicant wishes to pursue a PhD in Literacy Education, including the applicant's career goals; the applicant's prior experiences in literacy or literacy education (e.g., relevant teaching or other educational experiences); previous university degrees, programs, certificates, or emphases related to literacy; potential areas of focus in a literacy doctoral program; potential research interests; and any other information the applicant considers to be relevant to her or his admission;
- Three Letters of Recommendation from those who can speak to the applicant's intellect, scholarly abilities, teaching ability, or other qualifications for doctoral study. These letters typically would be former professors, supervisors, or administrators;
- An official report of the Graduate Record Examination (GRE) that was taken within the preceding 5 years;
- An academic writing sample is not required, but is preferred.
- Transcripts;
- TOEFL or IELTS score is required for international, non-native English speaking applicants.

In order to be considered for admission, applicants must meet the following minimum requirements:

- Minimum 3.000 GPA on a 4.000 scale on the applicant's bachelor's from an accredited institution, plus transcripts from all other schools attended.
- Interview with Literacy Education Program faculty, either in person or via telephone
- Master's degree is preferred.
- GRE minimum score of Verbal:153, Quantitative:144.
- TOEFL scores of 540 (paper-based test), 76 (internet-based test), 197 (computer based test) or IELTS scores of 6.5 higher are required for international, non-native English speaking applicants. Minimum scores do not guarantee admission.

Please see the Graduate Admissions and Graduate Student Regulations and Policies entries in the front section of the UW Catalog for more information.

Applications for the Doctor of Philosophy (PhD) program in Curriculum and Instruction with a concentration in Mathematics Education are reviewed for admission in fall and spring semesters. All applications will be completed through the UW Admissions website: <http://www.uwyo.edu/admissions/apply.html>.

Applicants are required to submit the following materials:

- Writing sample (an article, master's thesis, or well-done project/course paper);
- An application letter, which discusses yourself, your experience, and your potential research interests;
- A resume or curriculum vita;
- Three letters of reference;
- Transcripts from all universities attended. Unofficial transcripts can be loaded to the online application system, but if admitted to the University, official transcripts will need to be sent prior to beginning the program
- Copy of GRE scores
- International, non-native English speaking students must submit scores for a language proficiency exam, such as TOEFL or IELTS

In order to be considered for admission, applicants must meet the following minimum requirements:

- Master's degree in mathematics, mathematics education, or a related area is required, with a 3.000 minimum GPA.
- A minimum of three years of teaching experience is required.
- GRE minimum score of Verbal:153, Quantitative:144.
- TOEFL scores of 540 (paper-based test), 76 (internet-based test), 197 (computer based test) or IELTS scores of 6.5 higher are required for international, non-native English speaking applicants. Minimum scores do not guarantee admission.

Please see the Graduate Admissions and Graduate Student Regulations and Policies entries in the front section of the UW Catalog for more information.

Applications for the Doctor of Philosophy (PhD) program in Curriculum and Instruction with a concentration in Science Education are reviewed for admission in fall and spring semesters. All applications will be completed through the UW Admissions website: <http://www.uwyo.edu/admissions/apply.html>.

Applicants are required to submit the following materials:

- Letter of intent. In this letter, describe why you wish to pursue a PhD in Science Education, including your career goals; your prior experiences in science or science education (e.g., relevant teaching or other educational experiences); previous university degrees, programs, certificates, or emphases related to science; potential areas of focus in a science doctoral program; potential research interests; and any other information you consider to be relevant to your admission.
- GRE scores.
- Transcripts.
- TOEFL or IELTS scores (for international, non-native English speaking applicants).
- Applicants need to contact a member of the Science Education PhD Program faculty, either in person or via telephone, to discuss career and research goals. This assists us in assigning a graduate advisor upon admission.
- Recommended: sample of professional writing.

In order to be considered for admission, applicants must meet the following minimum requirements:

- GRE Scores: The admissions committee will consider the Verbal Reasoning and Quantitative Reasoning scores in its determination. Effective July 1, 2016 applicants must have GRE scores of 153 Verbal and 144 Quantitative Reasoning or higher to be considered for admission. Minimum scores do not guarantee admission. Other criteria, as well as faculty capacity, will be considered in the admission process.
- TOEFL scores of 540 (paper-based test), 76 (internet-based test), 197 (computer based test) or IELTS scores of 6.5 higher are required for international, non-native English speaking applicants. Minimum scores do not guarantee admission.
- Minimum GPA of 3.000 on bachelor's degree.

Applicants are evaluated on alignment of research interests with those of existing faculty, clarity of application letter and goals, prior teaching or work experience, letters of recommendation, transcripts (including GPA)

and previous research experience with an accompanying sample of professional writing if available, according to the Science Education PhD Admissions Rubric.

Following the application review, the program faculty will make a recommendation regarding admission for Graduate Study at UW. Applicants will be notified of the decision by email. Applications will be considered at any time, but students who apply by January 15 will receive full consideration for graduate assistantships for the following academic year.

Please see the Graduate Admissions and Graduate Student Regulations and Policies entries in the front section of the UW Catalog for more information.

Program Specific Graduate Assistantships

Applicants interested in a Graduate Assistantship must submit a graduate assistantship application to the College of Education Dean's Office.

Graduate Certificates

Graduate Certificate programs in Teaching Elementary School (TES), and in Teaching Secondary Content (TSC) with an option to earn a master's degree in Curriculum and Instruction have been established to provide an alternative licensure route through Wyoming's Professional Teaching Standards Board for individuals who have already completed a bachelor's degree. This on-campus program does not result in another degree; rather, it is an alternative avenue toward initial Wyoming teacher licensure, with the bonus that it provides up to 12 hours of graduate credit that can be applied to a master's degree in Curriculum and Instruction. Admission to both the Graduate Certificate in Teaching and the master's degree programs require separate applications. The actual licensure courses encompass three full-time semesters: one summer and the following fall and spring semesters, including student teaching. However, there are prerequisite professional education courses, as well as possible content courses that must be completed prior to beginning the summer-fall-spring sequence.

The Teaching Elementary School (TES) Graduate Certificate leads to initial teacher licensure in grades K-6. The Teaching Secondary Content (TSC) Graduate Certificate leads to initial teacher licensure in grades 6-8 in each of the following licensure areas: Agriculture, English, Mathematics, Modern Languages

(French, German, Spanish), Science (Biology, Chemistry, Physics, Earth System Science, Geology), and Social Studies.

Literacy Certificate Leading to a Wyoming Reading Endorsement

The University of Wyoming offers the required courses in the graduate literacy program. The program is designed to serve graduate level K-12 teachers in Wyoming who wish to obtain the Wyoming Reading Endorsement, and those who choose to apply the course work toward a master's or doctoral degree in Curriculum & Instruction.

Required Courses:

- EDCI 5580: Internship (3 credits)
- EDCI 5710 [5070]: Genre-Based, Discipline-Based Literacies (3 credits)
- EDCI 5720: Literacy Difficulties: Assessment and Instruction (3 credits)
- EDCI 5750: Research in Literacy Learning, Teaching, and Assessment in Classrooms, Part 1 (K-6) (3 credits)
- EDCI 5760 [5870]: Social Literacies (3 credits)
- EDCI 5755 Research in Literacy Learning, Teaching, and Assessment in Classrooms, Part 2 (K-6)
- EDCI 5770 Research in Literacy Learning, Teaching, and Assessment in Classrooms, Part 1 (6-12)
- EDCI 5775 Research in Literacy Learning, Teaching, and Assessment in Classrooms, Part 2 (6-12)

Endorsement K-6: 18 hours - EDCI 5760,

5710, 5720, 5750, 5755 plus one elective

Endorsement 6-12: 18 hours - EDCI 5760,

5710, 5720, 5770, 5775 plus one elective

Endorsement K-12: 21 hours - EDCI 5580,

5760, 5710, 5720, 5750, 5755, 5770, 5775

Electives

EDCI 5120 Young Adult Literature.....3

EDCI 5160 Recent Trends in Children's and Young Adult Literature3

For more information, visit the web page (www.uwyo.edu/ste/elementary-education/endorsements/certificate-of-literacy)

English as a Second Language Certificate leading to a Wyoming English as a Second Language Endorsement

The English as a Second Language (ESL) certificate leading to endorsement is designed to meet the ten state of Wyoming standards for teaching second language learners. It is offered in conjunction with departments in the College of Arts and Sciences. The need to address the specific educational issues and challenges English language learner students

face by way of culturally and linguistically responsive professional practices is of critical importance to the vitality of our classrooms, schools, and communities

Required Courses:

- EDCI 4762: Essential Sociolinguistics for English as a Second Language Learning and Teaching (3 credits)
- EDCI 4350/5350: Introduction to Second Language Acquisition(3 credits)
- EDCI 5430: Theory and Methods of ESL I (3 credits)
- EDCI 5440: Theory and Methods of ESL II (3 credits)
- EDCI 5580: Internship in English as a Second Language (3 credits)

For more information, visit the web page (www.uwyo.edu/ste/curriculum-instruction/english-second-language/)

The Early Childhood Special Education Program (Birth to Five) Leading to Wyoming Certification

Post-baccalaureate students who have earned a BA/BS in Elementary Education, Family and Consumer Sciences/Child Development Option, or a related field in early childhood development are eligible for this program. This is a pre-k program and does not prepare candidates to work in kindergarten or primary grade classrooms.

Required courses:

- EDEC 5220: Children with Disabilities: Birth to Five (3 credits)
- EDEC 5230: Curriculum and Materials for the Young Child with Disabilities (3 credits)
- EDEC 5240: Evaluation of Young Children with Disabilities (3 credits)
- EDEC 5250: Legal Issues in Early Childhood Special Education (3 credits)
- FCSC 4124: Families of Young Children with Special Needs (3 credits)
- EDEC 4350: Health Management Issues in Early Childhood Special Education (3 credits)
- EDEC 4320: Oral and Written Language Acquisition (3 credits)
- EDCI 5580: Internship in Early Childhood Special Education (6 credits)

For more information, visit the web page (www.uwyo.edu/ste/early-childhood-education/early-childhood-special-education.html)

Curriculum and Instruction (EDCI)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

4050. Minority Sexual/Gender Identity Issues in Education. 3. How youth of minority sexual and gender identities have been educated: the challenges they experience in U.S. K-16 schools, the risk factors related to academic success (health, safety, and emotional well being), and strategies to create safe, caring, and inclusive learning environments for all youth. Dual listed with EDCI 5050; cross listed with WMST 4050. *Prerequisites:* completion of WA and WMST 2000 with C or better.

4120 [LIBS 4120]. Literature for Young Adults. 3. Designed for prospective and working library media specialists and teachers who wish to strengthen their backgrounds in the utilization of literature with young adults in classrooms and libraries. The course involves the reading and critique of literature. Dual listed with EDCI 5120. *Prerequisite:* senior level or graduate standing. (Offered based on sufficient demand and resources)

4140 [LIBS 4140]. Storytelling. 3. An investigation of storytelling as an art and as an aid to instruction. Emphasis is on literature for pre-school and elementary age children. Dual listed with EDCI 5140. *Prerequisite:* junior standing or EDCI 4120 is recommended. (Offered based on sufficient demand and resources)

4160 [LIBS 4160]. Recent Trends in Children's and Young Adult Literature. 3. Important new developments in the subject matter, settings and style of children's and young adult books are identified and studied. Students in this course are expected to have a strong basic knowledge of children's and young adult literature. Dual listed with EDCI 5160. *Prerequisite:* EDCI 4120.

4300. Clinical Assessment and Instruction. 3 (Max. 3). Provides students with opportunities to work with school-aged students experiencing literacy difficulties. Students in this class tutor school-aged children for an entire semester under the direct guidance of the course instructor and director of the LRCC. *Prerequisite:* Completion of COM1; background check on file.

4330. Advanced Diagnosis, Corrective Reading Instruction. 3-4 (Max. 4). Designed to provide students with opportunities to work with children who have reading problems. Students in this class tutor under the direct guidance of the course instructor. *Prerequisites:* EDCI 3100, 4300 and consent of instructor.

4350. Introduction to Second Language Acquisition. 3. Addresses theoretical and conceptual foundations of working with second language learners. Focus is on the classroom applications of this theoretical base to interactions with English language learners, curriculum, instruction, assessment and evaluation, classroom organization, and school-community relations. Native American language revitalization issues are featured. Dual listed with EDCI 5350.

4390. Literature and Reading/Writing Instruction. 3. Links the use of literature for children with instruction and practice in reading, writing, spoken language, and critical thinking skills. Students are expected to have a strong background knowledge of literature for children before taking this course. Dual listed with EDCI 5390. *Prerequisite:* EDEL 2280, or basic children's literature course work.

4450 [4250]. Issues In Multicultural Education. 3. Provides the future teacher and other interested students with a better understanding of current issues and social foundations of multicultural America. Enables more accurate educational decisions related to utilizing strengths and diversity of each cultural group. Dual listed with EDCI 5450. *Prerequisite:* students must have at least 12 credit hours in education classes.

4665. History and Philosophy of American Education. 3. Provides cultural, philosophical, and historical perspectives drawn from the American experience and centered in the American ideology of equality of educational opportunity. Major trends and philosophies that have developed, and are developing, in American education will be shared through discussion, presentations, and written projects. Dual Listed with EDCI 5665. *Prerequisites:* Completion of WA with C or better.

4761. Linguistics, Sociolinguistics, and Social Literacies for Teachers. 3. Introduces key concepts in linguistics, sociolinguistics, and social literacies that are necessary for understanding and working with children from diverse linguistic and cultural backgrounds. As such, the course was designed to redirect students' attention from a sole focus on schooled language and literacy to an understanding of the diverse language and literacy knowledges and skills that children bring to school from their own sociocultural contexts. *Prerequisite:* EDST 2480.

4762. Essential Sociolinguistics for English as a Second Language Learning and Teaching. 3. This course is designed for the candidates in the ESL endorsement and graduate certificate program to focus on English as a second language teaching and learning. The

issues addressed will include: (a) social and cultural approach to language and literacy; (b) second language learning and identity; (c) culture, ethnicity, race, and language variations; (d) bilingualism, and (e) language attitudes. *Prerequisite:* admission to the English as a Second Language Endorsement Program.

5000. Principles of Curriculum. 3. Provides an overview of general understandings fundamental to the study of all aspects of curriculum to include pre-school, kindergarten thru high school. Consideration is given to the various factors, institutions and societal issues that impinge on and affect the decision making processes of curriculum developers. *Prerequisite:* graduate standing in education.

5010. Supervision of the School Music Program. 2-4 (Max. 4). Two sections: vocal; instrumental. Designed for graduate students who have a background in music education and for other interested graduate students in education. *Prerequisite:* 12 hours of education and graduate standing.

5020. Curriculum Workshop. 1-4 (Max. 4). Two sections: vocal; instrumental. Designed for graduate students who have a background in music education and for other interested graduate students in education. *Prerequisite:* 12 hours of education and graduate standing.

5050. Minority Sexual/Gender Identity Issues in Education. 3. How youth of minority sexual and gender identities have been educated: the challenges they experience in U.S. K-16 schools, the risk factors related to academic success (health, safety, and emotional well being), and strategies to create safe, caring, and inclusive learning environments for all youth. Dual listed with EDCI 4050; cross listed with WMST 5050. *Prerequisites:* completion of WA and WMST 2000 with C or better; graduate standing; completion/concurrent enrollment in ADED 5260.

5070. Educational Trends. 1-6 (Max. 6). Provides reading, discussion, research, and appraisal of new methods, materials, equipment, and experimental programs concerned with the improvement of education as it pertains to curriculum and instruction. The maximum allowable credit applies to the total offerings under this number. *Prerequisite:* 12 hours of education courses.

5090. Plan B Research. 1-3 (Max. 9). Under the guidance of a committee chair, the enrolled graduate student will complete a scholarly Plan B project. Plan B projects emerge from practice, typically involving a problem of interest within a student's school, classroom, or work site. Admission in the Curriculum and In-

struction graduate program required. Offered satisfactory/unsatisfactory only. *Prerequisite:* graduate standing.

5110. Foundations of American Indian Education. 3. Examines cultural, geographical, linguistic, spiritual, political and societal factors before, during and after colonization of the Americas. Definitions and day-to-day realities of terms like ethnocentrism, cultural relativism, assimilation, acculturation, and institutional racism. Development of insights into positive teacher-pupil-community relationships that honor culture and language differences and enhance achievement. Cross listed with NAIS 5110. *Prerequisites:* NAIS 1001 and 15 credit hours of NAIS or EDST.

5120. Literature For Young Adults. 3. Designed for prospective and working library media specialists and teachers who wish to strengthen their backgrounds in the utilization of literature with young adults in classrooms and libraries. Involves reading and critiquing literature. Dual listed with EDCI 4120. *Prerequisite:* senior level or graduate standing.

5121. History and Philosophy of American Indian Education. 3. Addresses the history of Indian education in the U.S. and Canada, examination of missionary initiatives, government programs, and tribal efforts. Review of documentary accounts of Native education, review autobiographical accounts of Native teachers and children. We will develop insight necessary for development of appropriate teaching methods and materials. Cross listed with NAIS 5121. *Prerequisites:* Post-Baccalaureate standing.

5130. Cultural Foundations of American Indian Education. 3. In-depth study and analysis of the educational experiences of American Indians, focusing on contemporary educational issues and experiences, examining the impacts of cultural orientations, stereotypes, bias and other issues on the educational attainment of American Indian students. Critique instructional practices and programs developed addressing the needs of American Indian students. Cross listed with NAIS 5130. *Prerequisites:* Post-Baccalaureate status.

5140. Storytelling. 3. An investigation of storytelling as an art and as an aid to instruction. Emphasis is on literature for preschool and elementary age children. Dual listed with EDCI 4140. *Prerequisite:* junior standing or EDCI 4120 is recommended.

5141. Instructional Methods in American Indian Education. 3. Addresses culturally responsive methodologies for teaching American Indian students, review of documentary accounts of Native education and autobiographical accounts of Native teachers

and children as students develop appreciation of the complexity and difficulties of Native education. Students acquire insight necessary for development of appropriate teaching methods and materials. Cross listed with NAIS 5141. *Prerequisites:* Post-Baccalaureate status.

5160. Recent Trends in Children's and Young Adult Literature. 3. Important new developments in the subject matter, settings and style of children's and young adult books are identified and studied. Students in this course are expected to have a strong basic knowledge of children's and young adult literature. Dual listed with EDCI 4160. *Prerequisite:* EDCI 4120. (Offered based on sufficient demand and resources)

5205. Methods of Teaching Middle-Level Mathematics. 3. Research based pedagogy and pedagogical content knowledge for teaching middle-level mathematics. Designed for practicing teachers of middle-grades mathematics. Cross Listed with NASC 5205. *Prerequisites:* admission to the SMTC program.

5215. Using Instructional Technology for Middle-Level Mathematics. 3. Covers the use of technology appropriate to middle-level mathematics teaching, such as microworlds, geographic information systems, spreadsheets, and other content appropriate technologies. Cross listed with NASC 5215. *Prerequisites:* admission to the SMTC Program.

5225. Assessment for Middle-Level Mathematics. 3. Middle-level Mathematics Initiative teacher participants examine, analyze, and implement a variety of assessments that are aligned with standards and instruction appropriate to the middle level math learner. Cross listed with NASC 5225. *Prerequisites:* admission to the SMTC program.

5250. Advanced Topics in Pedagogy. 3. A graduate level seminar to be taken concurrently with undergraduate methods courses in specific content areas (EDSE 425X-4260, EDEL 4309) EDCI 5250 is restricted to students pursuing teacher certification leading to a Master of Arts in Curriculum and Instruction. *Prerequisite:* Successful completion of EDCI 5550, EDST 3500, EDCI 5870, Seminar in Assessment, earned Bachelor's degree from an accredited institution.

5310. Reading Comprehension Processes and Instruction. 3. Designed to acquaint the student with recent developments, research findings, and newer practices. Viewpoints expressed by experts are compared, and an emphasis is given to the objectives of knowledge and to an understanding of attitude and skills. *Prerequisite:* graduate standing.

5320. The Writing Process in the Classroom. 3. Designed to acquaint the student with recent developments, research findings, and newer practices in the area of composition. Viewpoints expressed by experts are compared and an emphasis is given to the objectives of knowledge and to an understanding of attitudes and skills. *Prerequisite:* graduate standing.

5350. Introduction to Second Language Acquisition. 3. Addresses theoretical and conceptual foundations of working with second language learners. Classroom applications of this theoretical base to interactions with English language learners, curriculum, instruction, assessment and evaluation, classroom organization, and school-community relations. Native American language revitalization issues are featured. Dual Listed with EDCI 4350. *Prerequisite:* graduate standing.

5390. Literature and Reading/Writing Instruction. 3. Links the use of literature for children with instruction and practice in reading, writing, spoken language, and critical thinking skills. Students are expected to have a strong background knowledge of literature for children before taking this course. Dual listed with EDCI 4390. *Prerequisite:* EDEL 2280, or basic children's literature course work.

5400. Midpoint Portfolio Reflection. 1. Allows students to reflect, self-assess, and receive guidance related to their progress in the C&I Master's Program. Requirements include: self assessment of progress toward the C&I program outcomes, completion of a series of research abstracts, formation of the students' graduate committees and approval of programs of study. *Prerequisites:* admission to the Curriculum and Instruction Master's Program and completion of at least 12 hours of EDCI coursework.

5430. Theory and Methods of ESL I. 3. Provides an overview of theoretical and practical considerations in the teaching of English as a second/foreign language; acquaints students with different approaches, methods and procedures in TESL/TEFL; examines issues in the profession; requires a teaching/tutoring component. *Prerequisite:* EDCI 5350.

5440. Theory and Methods of ESL II. 3. Continues the theoretical and practical considerations in the teaching of ESL. Emphasis on Specifically Designed Academic Instruction in English (SDAIE) and literacy development for intermediate and advanced English language learners. Application of different approaches, methods, and procedures in TESL/TEFL. Development of curriculum. Issues in the profession. Requires teaching/tutoring component. *Prerequisites:* EDCI 5430.

5450. Issues in Multicultural Education.

3. Provides future and inservice teachers and other interested students with a better understanding of current issues and social foundations of multicultural America. Enables more accurate educational decisions related to utilizing strengths and diversity of each cultural group. Additional assignments are required of students completing this course for graduate credit. Dual listed with EDCI 4450. *Prerequisite:* 12 credit hours of education classes.

5480. Short Course. 1-6 (Max. 6). Provides offerings in special topics in curriculum and instruction on the basis of need. The maximum allowable credit is six semester hours. *Prerequisite:* 6 hours of education courses.

5490. Individual Problems. 1-6 (Max. 6). Provides flexible credit for seniors who may need the credit for graduation, or for students who wish to undertake intensive study of a special problem identified in a regular class. *Prerequisite:* 12 hours of education courses and consent of instructor.

5500. Classroom Assessment. 3. Provides reading, discussion, and research examining a variety of classroom-based assessments with a focus on the alignment of teaching, learning, and classroom assessment at the P-12 level. *Prerequisite:* graduate status.

5515. National Board Certification Seminar. 1-3 (Max. 12). Provides information and support for teachers in the National Board Certification process. Content includes: reviewing, understanding, and applying best practice research; development of differentiated instruction; integration of formative assessment and reflective practice; understanding problem solving across the curriculum; and focuses on writing strategies for National Board Certification success. *Prerequisites:* graduate student standing.

5550. The Art and Science of Teaching. 4. Students will engage in a variety of experiences related to teacher decision making. Students research a variety of curriculum and instruction topics to discern the range of theories and associated models and develop personal theories and methods they plan to employ in their classrooms. *Prerequisite:* successful completion of EDST 4000 and earned Bachelor's degree from an accredited institution.

5560. Seminar in Assessment. 1. One credit hour course is designed for students in the (post baccalaureate) teaching credential program with master's option. Covers important concepts of assessment such as teachers as graders, self-and peer-assessment techniques, standardized assessment instruments, challenges facing new teachers, using assessment for planning/modifying instruction to im-

prove learning experiences, and differentiated assessment in diverse classrooms. *Prerequisites:* successful completion of (grade C or higher) or concurrent registration in EDST 3550 or EDST 3500.

5580. Internship. 1 - 8. (Max 12). An internship experience may be required as part of the planned program in curriculum and instruction. A maximum of eight hours may be counted in meeting the minimum requirements of a graduate degree, but additional credit may be taken beyond this limit for the recording of appropriate supervised experience. *Prerequisite:* 15 hours of education, consent of department head, and graduate standing.

5600. Diversity in Education. 3. Provides practicing teachers and graduate level students with an understanding of the macrolevel influences on diversity in education. Includes an examination of competing models of diversity in education as well as reviews critical scholarly work in the field (including alternative methodological frameworks for engaging in this research). Includes competencies for developing advocacy-oriented skills and dispositions. *Prerequisite:* graduate level students only.

5665. History and Philosophy of American Education. 3. Provides cultural, philosophical, and historical perspectives drawn from the American experience and centered in the American ideology of equality of educational opportunity. Major trends and philosophies that have developed, and are developing, in American education will be shared through discussion, presentations, and written projects. Dual Listed with EDCI 4665. *Prerequisites:* Graduate student status; priority enrollment given to students registered in the C&I/Curriculum Studies area.

5710. Genre-based, Discipline-based Literacies. 3. Designed to provide educators with knowledge of reading factors as they relate to various genres and disciplines. Includes new literacies, assessment and development of comprehension, writing and oral language as learning tools, techniques for the development of vocabulary, questioning and study strategies appropriate to various disciplines and genres. *Prerequisite:* at least one year of successful classroom teaching experience in a recognized K-12 school setting.

5720. Literacy Difficulties: Assessment and Instruction. 3. Examines contemporary research and practice related to 1) literacy difficulties, 2) classroom assessment, and 3) RTI & school literacy reform. Students will read and discussion research addressing these issues and also engage in projects focused on intervention with struggling students and school wide-

systems for literacy intervention. *Prerequisite:* at least one year of successful teaching experience in a recognized K-12 school setting.

5730. Learning and Cognition. 3. The purpose of this course is to explore and critically analyze various learning theories from 1900 to present, including, but not limited to, behaviorism, constructivism, information processing, situated cognition, meaning learning, and cognitivism. Focus is on applying learning theories to impact K-12 student outcomes. *Prerequisite:* graduate standing or permission of instructor.

5750. Research in Literacy Learning, Teaching, and Assessment in Classrooms, Grades K-5, Part I. 3-6 (Max. 6). Examines contemporary research and practice in literacy instruction. Read about and discuss cutting-edge literacy methods related to 1) word recognition, 2) beginning and fluent text reading, 3) reading comprehension, and 4) vocabulary development. In addition, students will analyze their current literacy instruction and develop, implement, and evaluate lessons that involve new instructional approaches. *Prerequisites:* EDEC 4320 or EDCI 4330, 5310 or 5320 or graduate standing in education.

5755. Research in Literacy Learning, Teaching, and Assessment in Classrooms, Grades K-5, Part II. 3. Second of two related courses that address research in literacy instruction in elementary classrooms. The two-course sequence is required for students seeking the Wyoming K-5 Literacy Endorsement. Can also serve as a literacy content course in the Literacy Education Ph.D. option or as an elective in other graduate degree programs. *Prerequisite:* EDCI 5750.

5760. Social Linguistics Literacies. 3. Introduces key concepts in linguistics, sociolinguistics, and social literacies necessary for understanding and working with children from diverse linguistic and cultural backgrounds. Redirects focus from schooled language and literacy to an understanding of the diverse language and literacy knowledges and skills that children bring from their own sociocultural contexts. *Prerequisite:* at least one year of successful classroom teaching experience in a recognized K-12 school setting.

5770. Research in Literacy Learning, Teaching, and Assessment in Classrooms, Part I (6-12). 3. Critically examines reading-writing research for the express purpose of recognizing fundamentals of superior studies. Students are encouraged to select and pursue a topic in reading-writing research for intensive examination. Students may pursue areas of

emphasis in elementary, secondary, or higher education. *Prerequisite:* Graduate standing in education.

5775. Research in Literacy Learning, Teaching, and Assessment in Classrooms, Part II (6-12). 3. Designed to be the second in a two-course sequence that focuses on research and practice in adolescent literacy learning, teaching, and assessment. Will focus on applying research to practice. *Prerequisite:* Graduate standing in education.

5790. Learning Theories and Instructional Principles. 3. This course focuses on making connections between theoretical perspectives on teaching and learning, empirical work, and the actual practice of teaching. As a result, learners should expect to examine multiple learning theories, read research based on those theories, explore pedagogy that grows out of these theories, and integrate theory into practice in their own classrooms. *Prerequisite:* graduate standing.

5800. Curriculum Development. 3. The process of developing an early childhood through grade 12 curriculum are learned. Factors involved in initiating, developing, and evaluating curricula are studied. *Prerequisite:* EDCI 5000 and 5650.

5810. Writing for Professional Publications. 3. Designed to give students a structured experience with writing to publish in professional journals. Students will be expected to have written and submitted a publishable article by the end of the course. *Prerequisite:* 8 hours of graduate coursework completed.

5870. Seminar. 1-6 (Max. 8). Advanced students in curriculum and instruction work intensively on current issues and problems and participate in systematic, critical interpersonal evaluation. Students may pursue areas of emphasis in elementary, secondary, or higher education in the seminar. Only six hours may be allowed in the curriculum and instruction program on a student's program under this number. *Prerequisite:* consent of instructor and graduate standing.

5880. Special Problems. 1-6 (Max. 9). Provides a broad perspective through selected reading material and, wherever possible, the student collects and uses original information from a practical school situation. All work is done independently under the direction of a faculty member. As many conferences are held as necessary to assure successful completion of the project. *Prerequisite:* consent of instructor and school director, and graduate standing.

5890. Directed Professional Study. 1-6 (Max. 9). Provides additional opportunity for the student to pursue advanced graduate work

through independent research. Projects are done under the direction of a graduate faculty member offered in the areas of business education and distributive education. *Prerequisite:* consent of the instructor, the department head, and graduate standing.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5980. Dissertation Research. 1-12 (Max. 48). Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate level degree program.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

Literacy Education (LTED)

5800. Theoretical Perspectives on Literary Processes and Practices. 3. A doctoral seminar aimed at providing students with a broad introduction to theoretical perspectives on literacy processes and practices as well as the functions of theory in literacy research. Features reading and discussion of key works from cognitive, sociocultural, and critical research in literacy. *Prerequisite:* graduate student status.

5820. Research Methods in Literacy Education. 3. Doctoral seminar to examine the array of research methods (both quantitative and qualitative) employed in literacy research. *Prerequisite:* graduate student status.

5830. Review, Critique, and Synthesis of Literacy Research. 3. A doctoral seminar focused on a survey and analysis of historical and contemporary research in literacy. *Prerequisite:* Graduate standing.

5840. Research in Literacy Education with Diverse Populations. 3. Examines historical and current research on literacy practices with diverse students including African American, Latino, American Indian/Alaska Native, and English Language Learners of many cultures and linguistic groups. *Prerequisite:* graduate student status.

5860. History of Literacies. 3. Explores the nature of history and historical inquiry, the history of literacies from several perspectives, the history of global literacies across time, and the literacy histories of a diverse range of cultural groups. Also examines the history of literacy instruction in the United States. *Prerequisite:* Graduate standing.

5870. Special Topics in Literacy Education. 1-3 (Max 12). Advance students in literacy education work intensively on current issues and problems and participate in systematic, critical exploration of an identified issue or problem. Topics may include the following: New Literacy Studies, Adolescent, Adult, and Workplace Literacies; Disciplinary Literacy Research. May be repeated with different topics, up to 12 credit hours. *Prerequisite:* Permission of instructor and graduate standing.

Mathematics Education (EMAT)

5100. Theory and Research for Mathematical Learning. 3 (Max. 6). Advanced study of theory and research related to learning of mathematics, with attention to significant human mental development factors. Critically examines the scholarly basis for mathematical learning, including reviews of epistemological foundations, research-based factors, core issues, and advocacies for educational practices. *Prerequisite:* enrollment in Mathematics Education Ph.D. specialization or permission of the instructor.

5200. Advanced Study of Mathematics Curriculum, Assessment, and Evaluation. 3 (Max. 6). Advanced study of theory, research and practices related to curriculum, assessment and evaluation in mathematics education. Critically examines the historical and contemporary influences on these, including mathematical, philosophical, psychological, pedagogical, social and political forces and

factors. *Prerequisites:* enrollment in Mathematics Education Ph.D. program or permission of the instructor.

5300. Theory and Practice for Mathematics Teaching and Teacher Education. 3. Advanced study of theory and research of mathematics teaching teacher education. Examines the scholarly basis for current rationales and practices, including a critical review of evidential effectiveness, core issues, and advocacies for reform. A major emphasis will include analysis and critique of significant theoretical and research literature. *Prerequisites:* enrollment in Mathematics Education Ph.D. program or permission of the instructor.

5400. Analysis and Critique of Research in Mathematics Education. 3. Both theoretical and empirical research and scholarship in the field of mathematics education are critically analyzed. Students develop a deep understanding of pivotal historical and contemporary literature that helped shape the field of mathematics education and begin a formative development of their research interests. *Prerequisites:* at least two from EMAT 5100, EMAT 5200, or EMAT 5300.

5500. Colloquium in Mathematics Education. 1-3. (Max. 12). Provides for a broad perspective on mathematics education through selected reading materials. Students present and discuss ideas and summaries of the assigned reading and, wherever possible, the student collects and uses original information from practical situations. Students participate with the selected materials (journal articles, research, manuscripts, conference presentations) for class discussion. *Prerequisite:* Graduate student status.

5600. Quantitative Reasoning & Modeling in Mathematics and Science Education. 3. Advanced study of theories, issues, research and practices for teaching and learning mathematics and science focused on quantitative reasoning and mathematical modeling (QRaMM). Analysis of fundamental constructs relevant to QRaMM in education. Activities engage the scholarship of critical analysis, and interdisciplinary applications aimed at student knowledge and expertise in QRaMM. *Prerequisite:* Graduate student status.

5700. Principles and Methods for Integrated Teaching & Learning Mathematics & Science. 3. Advanced study of theory, research, and practice for teaching and learning mathematics and science using integrated approaches in curriculum, pedagogy, learning, and assessment. The course will be production oriented, with activities and developments

aimed at stimulating and supporting manuscripts to be published in STEM-appropriate venues. *Prerequisite:* Graduate student status.

5980. Dissertation Research. 1-12 (Max 12). Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrolled in a graduate level degree program.

Science Education (ESCI)

5100. Science Education Research Colloquium. 1 (Max. 3). The overarching goal of this graduate course is for Ph.D. students to be exposed to the most recent research methods, results, and implications of research on science education. *Prerequisite:* Graduate standing.

5200. Contemporary Science Education Research. 3. Develop a deep understanding of, and become conversant in, the current trends in research methodology and contemporary scholarly literature in science education research. *Prerequisite:* Graduate standing.

5250. Cognition and Learning in Science and Math Education. 3. Develop a deep understanding of, and become conversant in, the current learning sciences literature of cognition and learning focusing on how students learn science and mathematics. *Prerequisite:* Graduate standing.

5300. Research in Science Education I. 3. Students develop a deep understanding of, and become conversant in, contemporary research methods in science education. This course focuses on identifying research questions based on gaps in the literature, designing strategies to collect quantitative and/or qualitative evidence, and conducting the first phases of data collections and analysis. *Prerequisite:* Graduate standing.

5350. Research in Science Education II. 3. Part two of the Research in Science Education sequence. Building on the research started in ESCI 5300, students finalize analysis, develop findings, conclusions and implications, and create a viable journal article manuscript. *Prerequisites:* Graduate standing and ESCI 5300.

5600. History and Philosophy of Science and Mathematics Education. 3. Focuses on key individuals, theories and events of the past century which have contributed to the formation of current views, ideas, theories, and practices in mathematics and science education. *Prerequisite:* Graduate student status.

5610. Informal Science Learning Environment. 3. This course examines the literature, issues and opportunities related to informal science education environments, such as museums, planetariums, and extracurricular K-12 organizations. *Prerequisite:* Graduate standing.

5630. Science Teacher Ed & K12 Professional Development. 3. Addresses philosophies, research, theories and current issues related to pre-service science teacher education and in-service science teacher professional development. This course fulfills core requirements in the Science Education PhD program option. *Prerequisite:* Graduate student status.

School of Teacher Education

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Educational Studies (EDST)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

1101. First-Year Seminar. 3. [(none)♦FYS]

1230. The Citizen Factory: Schooling and Democracy in the US. 3. [I, L♦(none)].

Introduction to active learning, inquiry of pressing issues, and individual and collaborative processing of ideas through the curriculum, skills which will be reinforced throughout the baccalaureate experience. Open to all, the course appeals to any student with an interest in the public schools or schooling for democracy.

EDST 1200: Practicum I. 1. The course is designed to build educator identity, develop skills in observing the physical environment of educational settings, understand the responsibilities and ethics of educational professionals, and engage in and reflect on service learning activities. Students engage in classwork and at least 30 clock hours of practicum in educational settings. *Prerequisite:* Background check on file in the Teacher Preparation and Advising Office.

1500. Education for Social Justice. 3. [I,L♦(none)] Provides an introduction to the College of Education, UW, and the field of education in general. Students discover the primary intellectual activities associated with diversity, multiculturalism, and social justice. Will be of most interest to those interested in teaching as a career.

2450 [EDFD 2450]. Foundations of Development and Learning. 3. [CS♦H] Introduces students to the essential understandings of child/adolescent development and learning. The course emphasizes various theories and concepts related to student development with attention to cognitive, social, and physical perspectives. *Prerequisite:* 2.500 UW institutional GPA. (Offered each semester)

2475. [EDUC 2475]. Independent Studies. 1-3 (Max. 9). Offers students the opportunity to complete special course-related work independently under direction of a college faculty member. Directed readings are done and projects are completed. Requires at least two conferences with instructor. *Prerequisite:* consent of instructor.

2480. Diversity and the Politics of Schooling. 4. [D◀H] Designed to acquaint the student with philosophical, social, and political influences on North American education, to develop an understanding of the qualities of critical thinking, to raise awareness of critical issues in education, to develop an understanding of individual differences, diversity and multiculturalism. *Prerequisites:* Grade of C or better in EDST 2450, sophomore standing, 2.500 cumulative University of Wyoming institutional GPA, and successful completion of approved background check. (Offered each semester)

3000 [EDUC 3000]. Teacher as Practitioner. 6. [WB, O◀COM2] Begins Phase II of the teacher education sequence. Practicum experiences are integral. Links theory and philosophy to classroom practice. Focuses on three major topics: planning for educational experiences, instructional models and strategies, and managing classrooms. *Prerequisites:* successful completion of WA, grade of C or better in QA, 2.750 cumulative GPA, grade of C or better in EDST 2480, grade of C or better in ITEC 2360, grade of C or better in EDEX 2484, junior standing, current State of Wyoming substitute teaching license. (Offered each semester)

3550. Educational Assessment. 2. Designed to introduce students to key concepts and issues in classroom and standardized education assessments. Topics include standards, reliability and validity of norm- and criterion-referenced assessments, and special issues surrounding the assessment of students with special needs. Addresses the basic ideas of classroom test design. *Prerequisites:* grade of C or better in QA course, and EDST 2480, 2.750 Cumulative UW Institutional GPA. (Offered each semester)

4000. Foundations of Education for a Diverse Society. 3. Designed to acquaint students with philosophical, social, and political influences of North American education; to develop an understanding of the qualities of critical thinking for reflective teaching; to raise awareness of contemporary critical issues in education; to develop an understanding of individual differences, diversity, and multiculturalism. Practicum included. *Prerequisites:*

earned bachelor's degree from an accredited institution, a cumulative UW institutional GPA of 2.750 or better and EDST 2450.

4050. Diversity & Social Justice: Theory and Practice. 3. Addresses multiple disciplines. Expose students to domestic and international perspectives of diversity and social justice. This course will move students from a theoretical lens of diversity and social justice toward becoming change agents. *Prerequisites:* Junior/senior standing and completion of EDST 1500 or WMST/CHST/AMST/AAST/NAIS 1040.

4110. Foundations of American Indian Education. 3. [D◀(none)] Examines cultural, geographical, linguistic, spiritual, political and societal factors before, during and after colonization of the Americas. Definitions and day-to-day realities of terms like ethnocentrism, cultural relativism, assimilation, acculturation, and institutional racism. Development of insights into positive teacher-pupil-community relationships that honor culture and language differences and enhance achievement. Cross listed with NAIS 4110. *Prerequisites:* NAIS 1001 and 15 credit hours of NAIS or EDST.

4600. Diversity & Social Justice Minor Capstone. 3-6 (Max. 6). In community-engaged learning, sometimes called "service learning," students have the privilege of gaining work experience with the benefit of a community mentor. This course is a seminar class with a field experience. Students will meet as a group as well as assigned a community field placement experience. *Prerequisite:* EDST 4050.

Elementary Education (EDEL)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀Q]).

1000. Exploring Hot Topics in Education. 2. [I◀(none)] Academic, content-based course designed for first year students. Focuses on critical-thinking skills necessary to understand, analyze, and produce knowledge within the framework of educational inquiry.

1010 [EDCI 1010]. Field Experience for Prospective Elementary and Secondary Teachers. 1-4 (Max. 4). Introductory course in teacher education. Provides an overview of the theory and practice of what is required to become and be a teacher. An initial practicum is included. Cross listed with EDSE 1010. *Prerequisite:* sophomore standing. (Offered based on sufficient demand and resources.)

EDEL 1200: Introduction to Elementary Education. 3. This course is designed to introduce first-year elementary education majors to educational issues relevant to teaching, learning, curriculum, assessment, school politics, and special needs of students in elementary settings.

1410. [EDCI 1410]. Elementary School Mathematics Seminar I. 1. Covers selection of basic mathematics concepts, materials and curricula appropriate for elementary schools. This course parallels the content of MATH 1100 and should be taken during the same semester. Experiences in assigned mentor teacher classrooms are required. *Prerequisite:* consent of instructor.

1430. [EDCI 1430]. Life Science in the Elementary School. 1. Covers selection of basic life science concepts, materials and curricula appropriate for elementary school. This course parallels the content of LIFE 1020 and concurrent enrollment in LIFE 1020 is expected.

1440. [EDCI 1440]. Physical Science in the Elementary School. 1. Covers selection of basic physical science concepts, materials and curricula appropriate for elementary school. This course parallels the content of PHYS 1090 and concurrent enrollment in PHYS 1090 is expected.

1450. [EDCI 1450]. Earth Science in the Elementary School. 1. Covers selection of basic earth science concepts, materials, and curricula appropriate for elementary school. This course parallels the content of ASTR/GEOL 1070 and concurrent enrollment in ASTR/GEOL 1070 is expected.

2140. Teaching Literacy in the Elementary School. 3. Provides an acquaintance with basic assumptions underlying curriculum and processes in literacy and to give opportunity for selecting and using instructional materials. *Prerequisites:* ENGL 1010, sophomore standing, admitted into Elementary Education program.

2000 [EDCI 2000]. Undergraduate Seminar in _____. 1-2 (Max. 8). Designed to discuss strategies and instructional activities used in content courses the students take and to be a linkage between what the prospective teachers study and what they will teach. It provides the opportunity to discuss appropriate activities, strategies and programs in a teaching area related to the content area being studied. Cross listed with EDSE 2000. *Prerequisite:* consent of instructor. (Offered based on sufficient demand and resources)

2275. Literature for Young Children. 3. [CH◀(none)] Introduce major genres and conventions. Will develop critical skills for reading and writing about children's literature and culture; interpretive skills to enrich the

understanding of literature for readers 0-7 years of age; and develop an awareness of shifts in children's literature for early readers. *Prerequisite:* ENGL 1010 and sophomore standing.

2280 [LIBS 2280]. Literature for Children.

3. [CH◀H] A survey course, the purpose of which is to prepare prospective elementary teachers and library-media specialists to provide knowledgeable service in the use of print and non-print materials for children. Includes study of evaluative criteria, wide reading, viewing and listening as well as discussion of literature for children. *Prerequisite:* successful completion of ENGL 1010, sophomore standing, education major.

2410. [EDEL 1420, EDCI 1420]. Elementary School Mathematics Seminar II. 1.

Covers selection of basic mathematics concepts, materials and curricula appropriate for elementary schools. Parallels the content of MATH 2120 and concurrent enrollment in MATH 2120 is expected. *Prerequisite:* consent of instructor.

3140 [EDCI 3140]. Teaching Reading in the Elementary School. 2-4 (Max. 4).

Provides an acquaintance with basic assumptions underlying curriculum and processes in reading and to give opportunity for selecting and using instructional materials. *Prerequisites:* junior standing, 2.500 minimum cumulative GPA, satisfactory completion of WA requirements, committee approval. (Offered based on sufficient demand and resources)

3170 [EDCI 3170]. Art in the Elementary School. 3. [CA◀(none)]

Provides a foundation for understanding art in order to facilitate the teaching of art and the integration of art education into the elementary school curriculum. Involves both applied reading and studio production. Attention is given to development of artistic skills and meaningful art experiences based on DBAE principles. *Prerequisites:* junior classification, 2.500 minimum cumulative GPA.

3710. Disciplinary/Genre-Based Literacy.

3. Introduction to instruction in genre-specific and disciplinary appropriate literacy practices, with a focus on characteristics of a variety of genres and disciplines and how those characteristics inform appropriate comprehension instruction. *Prerequisite:* EDEL 2140.

3720. Literacy Difficulties: Assessment and Instruction. 3.

Focuses on the causes of student difficulties with reading and writing and assessment and instruction for students with such difficulties. *Prerequisite:* EDEL 2140.

4000 [EDUC 4000]. Becoming a Reflective Practitioner: Practicum. 2.

Part of Phase IIIa of the teacher education program. Practicum experience is integral to EDUC 4250 and must

be taken concurrently. *Prerequisites:* 2.500 cumulative GPA, successful completion of EDST 3000 (grade, interview and portfolio).

4109 [EDUC 4109]. Elementary Humanities Education. 5.

Content and pedagogy to develop the reflective practitioner of teaching humanities in the elementary school. The following themes are addressed: curriculum; theory translated into instructional planning and practice; practices that promote effective learning; behavior and relationships; and teaching strategies. *Prerequisites:* 2.750 cumulative GPA; 2.500 content GPA; grade of C or better in EDST 3000; successful completion of specific content courses required in major; grade of C or better in EDST 3550; concurrent enrollment in EDEL 4309 and EDEL 4409.

4309 [EDUC 4309]. Elementary Literacy Education. 2-5 (Max. 6).

Encompasses content and pedagogy to develop the reflective practitioner for teaching literacy in the elementary school. Addresses the following themes: curriculum; theory translated into instructional planning and practice; practices that promote effective learning; behavior and relationships; and teaching strategies. *Prerequisites:* 2.750 cumulative GPA; 2.500 content GPA; Grade C or better in EDST3000, successful completion of specific content courses required in major; grade C or better in EDST3550. Concurrent enrollment in EDEL 4109 and EDEL 4409.

4409 [EDUC 4409]. Elementary Math/Science Education. 5-6 (Max. 6).

[WC◀(none)] Includes content and pedagogy in teaching math/science in the elementary school. Addresses the following themes: curriculum; theory translated into instructional planning and practice; practices that promote effective learning; behavior and relationships; and teaching strategies. *Prerequisites:* 2.750 cumulative GPA; 2.500 content GPA; grade of C or better in EDST 3000; successful completion of specific content courses required in major; grade of C or better in EDST 3550; concurrent enrollment in EDEL 4109 and EDEL 4309.

4500 [EDUC 4500]. Residency in Teaching. 1-16 (Max. 24).

Comprises the final professional academic semester of the teacher education program. A full-time residency, including a period of being intensively mentored and coached, a period of independent teaching and a period of team teaching. Available for S/U only. Cross listed with EDSE 4500. *Prerequisites:* 2.750 cumulative GPA, 2.500 GPA in major content courses, completion of all content courses, successful completion of Phase IIIa specific pedagogy and practicum, complete review of the prospective teacher's record.

4740 [EDCI 4740]. Field Studies in _____.

1-12 (Max. 45). Offered only through extension services. Broad and flexible and can be utilized in numerous situations to meet local needs. Credit in this course is not applicable toward advanced degrees. Offered S/U only. *Prerequisite:* 6 hours of education. (Offered based on sufficient demand and resources)

4975. [EDCI 4975] Independent Study.

1-3 (Max. 6). Primarily for upper-division students who can benefit from independent study with minimal supervision. Given to allow interested students to pursue specific aspects of curriculum and instruction. Cross listed with EDSE 4975. *Prerequisites:* 12 hours of education courses and consent of instructor.

Early Childhood (EDEC)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀Q]).

1020 [EDCI 1020]. Introduction to Early Childhood Education. 3.

Introduces students to the field of early childhood education through lecture, discussion, observation and participation. The student will be exposed to different programs currently in operation in the community and region. Special emphasis will be placed on evaluating early childhood education as a career.

1101. First-Year Seminar. 3. [(none)◀FYS]

2000. Engaging Families in Early Childhood Settings. 3.

Focus on the philosophical, psychological, and sociocultural aspects of working with families and children in early childhood educational, home, and community settings.

3000. Observing Young Children. 3.

The general goal of the course is to introduce students to observation and recording techniques appropriate for assessing the growth and development of young children in the school setting. A secondary goal is to understand how observation and recording techniques can facilitate curriculum planning and parent-teacher conferences. *Prerequisites:* EDEC 1020 and FCSC 2121.

3220 [EDCI 3220]. Curriculum and Learning Environments in Early Childhood Education. 3.

Early childhood curriculum and instructional practices will be reviewed, developed, and integrated with a focus on the role of learning environments, materials and play in supporting the teaching and learning process. Students have the opportunity to design meaningful learning experiences through practicum. *Prerequisites:* EDEC 1020 and FCSC 2121 (or both PSYC 2300 and FCSC 2122).

4320 [EDCI 4320]. Oral and Written Language Acquisition. 3. Introduces the student to the nature of language development as it pertains to oral and written communication in education. Recent research in the areas of oral and written language acquisition is compared and contrasted. Implications for facilitating the development of all language modes in educational settings is emphasized. *Prerequisites:* EDST 2480 or equivalent, junior standing and declared Elementary Education or Family and Consumer Sciences major.

4350. Health Management Issues in Early Education. 3. Provides the student the opportunity to examine the implications of a child's health status on his/her personal, educational, social and cognitive development. Provides personnel working closely with the young child with disabilities and his/her family an understanding of the issues related to health concerns and a framework for intervention planning. Special emphasis is placed on concerns specific to the child in a day care, preschool or other school setting. *Prerequisites:* junior standing and consent of the instructor.

4580. Internship in Early Childhood/Early Childhood Special Education. 1 (Max. 6). The internship experience allows the early childhood/early childhood special education program candidate to demonstrate the knowledge and skill gained from coursework offered throughout the EC/ESCE programs. Candidates enroll in the internship after completion of all required courses in the programs. Dual listed with EDEC 5580. *Prerequisite:* permission of the instructor is required.

5220. Children with Disabilities. 3. Purpose is to introduce students to the effects of a disability on the development of the young child. Recent research in the area of early childhood special education will be examined. Educational implications will be emphasized. *Prerequisite:* Bachelor's degree in education.

5230. Curriculum and Materials for Young Children with Disabilities. 3. Involves the study and development of curriculum strategies appropriate for the child with disabilities from birth through age five. *Prerequisite:* graduate standing.

5240. Evaluation of Young Children with Disabilities. 3. Prepares students to select, administer, and interpret evaluation tools appropriate for planning with young children with disability. *Prerequisite:* graduate standing.

5250. Legal Issues in Early Childhood Special Education. 2. Introduces students to the legal issues surrounding the education of young children with disabilities. The intent and implications of P.L. 99457 will be explored

and examined to better assist the specialist in serving children with disabilities and their families. *Prerequisite:* EDEC 5220.

5580. Internship in Early Childhood/Early Childhood Special Education. 1 (Max. 6). The internship experience allows the early childhood/early childhood special education program candidate to demonstrate the knowledge and skill gained from coursework offered throughout the EC/ESCE programs. Candidates enroll in the internship after completion of all required courses in the programs. Dual listed with EDEC 4580. *Prerequisite:* permission of the instructor is required.

Secondary Education (EDSE)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1000. Exploring Hot Topics in Secondary Education. 2. [I,L◀▶(none)] Academic, content-based course designed for first year students. Focuses on critical-thinking skills necessary to understand, analyze, and produce knowledge within the framework of educational inquiry. Themes include diversity and other issues found in Secondary Education (e.g. High Stakes testing, inclusion, or school violence). Faculty member's expertise areas within secondary education will determine appropriate themes.

1010 [EDCI 1010]. Field Experience for Prospective Elementary and Secondary Teachers. 1-4 (Max. 4). Introductory course in teacher education. Provides an overview of the theory and practice of what is required to become and be a teacher. An initial practicum is included. Cross listed with EDEL 1010. *Prerequisite:* sophomore standing.

1101. First-Year Seminar. 3. [(none)◀▶FYS] 2000 [EDCI 2000]. Undergraduate Seminar in _____. 1-2 (Max. 8). Designed to discuss strategies and instructional activities used in content courses the students take and to be a linkage between what the prospective teachers study and what they will teach. It provides the opportunity to discuss appropriate activities, strategies and programs in a teaching area related to the content area being studied. Cross listed with EDEL 2000. *Prerequisite:* consent of instructor.

3010 [EDIE 3010]. Contemporary Philosophies in Technical Education. 1-3 (Max. 3). Provides industrial education students with a sound contemporary philosophy for curriculum development and instructional planning. Emphasis is placed on current programs, phi-

losophies, history, youth group development and advisory committee activities. *Prerequisites:* 8 credit hours of education course work. (Offered through UW/CC)

3020. Facilities and Advisory Management. 2-4 (Max. 4). Students engage in identifying RFP applications and applies for grants that are geared toward the Technical classroom as well as the process of assembling and managing an advisory committee, a required component of all CTE programs. Prepares Technical Teachers for the non-teaching requirements associated with the CTE programs. *Prerequisites:* junior standing in Technical Education.

3030. Construction Technology. 3. Introduces students to the principles and practices of the construction industry, through a combination of classroom and laboratory experiences. In addition, this course outlines the construction content area as taught in the technical education classroom and emphasizes development of curricula materials. *Prerequisites:* 12 hours of technical content courses from an approved list. (Offered through UW/CC)

3040 [EDIE 3040]. Energy and Power Technology. 3. A conceptual analysis and synthesis of energy requirements and sources, with emphasis on alternate energy systems. Analysis of energy conversion and the application of mechanical, fluid, thermal and electrical power systems. *Prerequisite:* PHYS 1050 or 1110. (Offered through UW/CC)

3050 [EDIE 3050]. Communications Technology. 3. Designed to give students knowledge and experience in the major concepts of graphic communications, including: communication, design, image generation and production practices of modern industry. Also covers curricular and pedagogical concerns related to teaching communications technology at the secondary school level. *Prerequisite:* 12 credit hours of technical content courses from an approved list. (Offered through UW/CC)

3270. Subject Matter Specific Methods I: Secondary English Education. 3-6 (Max. 6). Introduction of content and pedagogy in English Education. *Prerequisite:* grade of C or better in EDST 3000/EDCI 5550; Background check on file; 2.750 overall UW cumulative GPA; concurrent enrollment in EDSE 4270.

3271. Subject Matter Specific Methods I: Secondary Mathematics Education. 3-6 (Max. 6). Introduction of content and pedagogy in Mathematics Education. *Prerequisite:* grade of C or better in EDST 3000/EDCI 5550; Background check on file; 2.750 overall UW cumulative GPA; concurrent enrollment in EDSE 4271.

3272. Subject Matter Specific Methods I: Art Education K-12. 3-6 (Max. 6). Introduction of content and pedagogy in Art Education K-12. *Prerequisite:* grade of C or better in EDST 3000/EDCI 5550; Background check on file; 2.750 overall UW cumulative GPA; concurrent enrollment in EDSE 4272.

3273. Subject Matter Specific Methods I: Secondary Social Studies Education. 3-6 (Max. 6). Introduction of content and pedagogy in Secondary Social Studies Education. *Prerequisite:* grade of C or better in EDST 3000/EDCI 5550; Background check on file; 2.750 overall UW cumulative GPA; concurrent enrollment in EDSE 4273.

3275. Subject Matter Specific Methods I: Secondary Science Education. 3-6 (Max. 6). Introduction of content and pedagogy in Science Education. *Prerequisite:* grade of C or better in EDST 3000/EDCI 5550; Background check on file; 2.750 overall UW cumulative GPA; concurrent enrollment in EDSE 4275.

3276. Subject Matter Specific Methods I: Secondary Modern Language Education. 3-6 (Max. 6). Introduction of content and pedagogy in Modern Language Education. *Prerequisite:* grade of C or better in EDST 3000/EDCI 5550; Background check on file; 2.750 overall UW cumulative GPA; concurrent enrollment in EDSE 4276.

3277. Subject Matter Specific Methods I: Secondary Technology Education. 3-6 (Max. 6). Introduction of content and pedagogy in Industrial Technology Education. *Prerequisite:* grade of C or better in EDST 3000/EDCI 5550; Background check on file; 2.750 overall UW cumulative GPA; concurrent enrollment in EDSE 4277.

3278. Subject Matter Specific Methods I: Secondary Agriculture Education. 3-6 (Max. 6). [WC◀(none)] Introduction of content and pedagogy in Agriculture Education. *Prerequisite:* grade of C or better in EDST 3000/EDCI 5550; Background check on file; 2.750 overall UW cumulative GPA; concurrent enrollment in EDSE 4278.

3540 [EDCI 3540]. Teaching Reading and Study Strategies in the Content Areas. 2-4 (Max. 4). Provides students majoring in secondary education programs with a knowledge of reading factors as they relate to various disciplines. Content includes estimating students' reading ability, techniques for vocabulary development, questioning strategies, and developing reading related study skills. *Prerequisites:* junior standing and minimum 12 hours in discipline area.

4070 [EDAS 4070, EDVE 4070]. Educational Trends in _____. 1-3 (Max. 6). Provides reading, discussion, research and appraisal of new methods, materials, equipment and experimental programs concerned with improvement of education as it pertains to areas of secondary education: agricultural, art, English, mathematics, middle school, modern language, science, and social studies education. The maximum allowable credit applies to the total offerings under this number. *Prerequisite:* 6 hours of education.

4270. Subject Matter Specific Methods II: Secondary English Education. 3-6 (Max. 6). [WC◀COM3] Advanced content and pedagogy in English Education. *Prerequisites:* grade of C or better in EDST 3000/EDCI 5550; Background check on file; 2.750 overall UW cumulative GPA; 2.500 in content GPA (grade of C or better in specific content courses required in major); concurrent enrollment in EDSE 3270/EDCI 5250.

4271. Subject Matter Specific Methods II: Secondary Mathematics Education. 3-6 (Max. 6). [WC◀COM3] Advanced content and pedagogy in Mathematics Education. *Prerequisites:* grade of C or better in EDST 3000/EDCI 5550; Background check on file; 2.750 overall UW cumulative GPA; 2.500 in content GPA (grade of C or better in specific content courses required in major); concurrent enrollment in EDSE 3271/EDCI 5250.

4272. Subject Matter Specific Methods II: Art Education K-12. 3-6 (Max. 6). [WC◀COM3] Advanced content and pedagogy in Art Education. *Prerequisites:* grade of C or better in EDST 3000/EDCI 5550; Background check on file; 2.750 overall UW cumulative GPA; 2.500 in content GPA (grade of C or better in specific content courses required in major); concurrent enrollment in EDSE 3272/EDCI 5250.

4273. Subject Matter Specific Methods II: Secondary Social Studies Education 3-6 (Max. 6). [WC◀COM3] Advanced content and pedagogy in Social Studies Education. *Prerequisites:* grade of C or better in EDST 3000/EDCI 5550; Background check on file; 2.750 overall UW cumulative GPA; 2.500 in content GPA (grade of C or better in specific content courses required in major); concurrent enrollment in EDSE 3273/EDCI 5250.

4274. Subject Matter Specific Methods II: Music Education K-12. 3-6 (Max. 6). Advanced content and pedagogy in Music Education. *Prerequisites:* grade of C or better in EDST 3000/EDCI 5550; Background check on file; 2.750 overall UW cumulative GPA; 2.500 in

content GPA (grade of C or better in specific content courses required in major); concurrent enrollment in EDSE 3274/EDCI 5250.

4275. Subject Matter Specific Methods II: Secondary Science Education. 3-6 (Max. 6). [WC◀COM3] Advanced content and pedagogy in Science Education. *Prerequisites:* grade of C or better in EDST 3000/EDCI 5550; Background check on file; 2.750 overall UW cumulative GPA; 2.500 in content GPA (grade of C or better in specific content courses required in major); concurrent enrollment in EDSE 3275/EDCI 5250.

4276. Subject Matter Specific Methods II: Secondary Modern Language Education 3-6 (Max. 6). [WC◀COM3] Advanced content and pedagogy in Modern Language Education. *Prerequisites:* grade of C or better in EDST 3000/EDCI 5550; Background check on file; 2.750 overall UW cumulative GPA; 2.500 in content GPA (grade of C or better in specific content courses required in major); concurrent enrollment in EDSE 3276/EDCI 5250.

4277. Subject Matter Specific Methods II: Secondary Technology Education. 3-6 (Max. 6). [WC◀COM3] Advanced content and pedagogy in Industrial Technology Education. *Prerequisites:* grade of C or better in EDST 3000/EDCI 5550; Background check on file; 2.750 overall UW cumulative GPA; 2.500 in content GPA (grade of C or better in specific content courses required in major); concurrent enrollment in EDSE 3277/EDCI 5250.

4278. Subject Matter Specific Methods II: Secondary Agriculture Education. 3-6 (Max. 6). [(none)◀COM3] Advanced content and pedagogy in Agriculture Education. *Prerequisites:* grade of C or better in EDST 3000/EDCI 5550; Background check on file; 2.750 overall UW cumulative GPA; 2.500 in content GPA (grade of C or better in specific content courses required in major); concurrent enrollment in EDSE 3278/EDCI 5250.

4279. Subject Matter Specific Methods II: Biological Science Methods for Agricultural Education Majors. 3. Provide meaningful learning in preparation for a professional career in a secondary school setting, teaching life science courses in addition to agriculture classes. Students will be engaged as active participants in discussions and hands-on science activities. The course is designed to offer experiences to enhance pedagogical content knowledge as well as skills to successfully make science education accessible for all students. Special attention will be given to creating a learning environment that fosters the development of inquiry skills and safety both in the classroom and field settings. *Prerequisites:* Grade

of C or better in EDST 3000, 2.750 minimum GPA in major content courses, grade C or better in specific content courses required in the Secondary Biology Endorsement.

4280. Subject Matter Specific Methods: Computer Science. 2. Introduction of content and pedagogy in Computer Science Education. Includes pedagogy, pedagogical content knowledge, and contact curriculums for teaching computer science at secondary school levels. A variety of instructional procedures will be employed including group work, modeling, lab work, micro-teaching, and lecture/demonstration. *Prerequisites:* COSC 3100 or concurrent enrollment and COSC 3020.

4500 [EDUC 4500]. Residency in Teaching. 1-16 (Max. 24). Comprises the final professional academic semester of the teacher education program. A full-time residency, including a period of being intensively mentored and coached, a period of independent teaching and a period of team teaching. Available for S/U only. Cross listed with EDEL 4500. *Prerequisites:* 2.750 cumulative GPA, 2.500 GPA in major content courses, completion of all content courses, successful completion of Phase IIIa specific pedagogy and practicum, complete review of the prospective teacher's record.

4900. Best Practices Active Learning. 1. This course is a seminar aimed at discussing active learning in large-scale classrooms and best practices for engaging students. The target audience for this course are post-baccs, education majors, and undergraduates serving as learning assistants in large classrooms. Having some in-class teaching experience is advantageous but not necessary. Dual listed with EDSE 5900. Restricted to LAMP Scholar Learning Assistants and Supplemental Instructors (LeARN Program).

4975. [EDCI 4975] Independent Study. 1-3 (Max. 6). Primarily for upper-division students who can benefit from independent study with minimal supervision. Given to allow interested students to pursue specific aspects of curriculum and instruction. Cross listed with EDEL 4975. *Prerequisites:* 12 hours of education courses and consent of instructor.

5900. Best Practices Active Learning. 1. This course is a seminar aimed at discussing active learning in large-scale classrooms and best practices for engaging students. The target audience for this course are post-baccs, education majors, and undergraduates serving as learning assistants in large classrooms. Having some in-class teaching experience is advantageous but not necessary. Dual listed

with EDSE 4900. Restricted to LAMP Scholar Learning Assistants and Supplemental Instructors (LeARN Program).

Agricultural Education (EDAG)

3150. Community Programs in Agricultural Education. 3. This course is designed to determine the resources and trends of local communities with respect to agricultural production and agribusiness. Emphasis will be placed on agricultural education program policies, FFA chapter advisement, planning and managing the instructional program, and the identification and completion of records and reports required of a teacher of agricultural education in Wyoming. *Prerequisite:* Agricultural Education major.

4170 [EDAS 4170, EDVE 4170]. Principles of Agricultural Mechanics and Technology. 3. Content will emphasize those skills commonly taught in Wyoming agricultural education in the secondary school system with an emphasis on advanced gas and plasma welding theory, small gas engines, and advanced electrical wiring and practices. Designed for students preparing to teach agricultural science in the Wyoming public school system. *Prerequisite:* EDAG 4070 or approval of instructor.

4180 [EDAS 4180, EDVE 4180]. Techniques of Agricultural Mechanics and Technology. 3. Techniques of agricultural mechanics and instruction. Content will emphasize those skills commonly taught in the Wyoming school system agricultural mechanics program with emphasis on woodworking, welding theory, agricultural plumbing, and electrical wiring and practices. Designed for students preparing to teach agricultural science in the Wyoming public school system. *Prerequisite:* Junior standing or consent of instructor.

4970 [EDAS 4970, EDVE 4970]. Individual Problems. 1-3 (Max. 6). Provides flexible credit for seniors who may need credit for graduation, or for students who wish to undertake intensive study of a special problem identified in a regular class. Offered in areas of vocational education, vocational agriculture, family and consumer sciences, and trade and industrial education. *Prerequisite:* 12 hours of education courses.

School of Counseling, Leadership, Advocacy, and Design

332 Education Building, (307) 766-2366 and

316 Education Building, (307) 766-5649

Web site: www.uwyo.edu/clad

School Director: Suzanne Young

The School of Graduate Studies in Education includes the following program areas: Counseling, Educational Leadership, Higher Education Administration, Learning, Design and Technology, Research, and Special Education.

Program Areas

Counseling

Counselor education curricula experiences concentrate on the integration of helping skills, theory and practice. The programs utilize a personalized, developmentally oriented focus and prepare professional counselors for entry into school and mental health settings.

The undergraduate counseling courses are designed to achieve the following objectives:

- enhance self-awareness
- facilitate effective relationship skills
- increase leadership knowledge and skills
- assist learners in maximizing their potential

Graduate Study

Counselor education offers a two-year (61-65 semester hours) master's degree program for practice in schools, colleges, universities, and community agencies, as well as private practice. The Council for Accreditation of Counseling and Related Educational Programs (CACREP), the national accrediting body recognized by the Council for Higher Education Accreditation, has conferred accreditation to the following M.S. specializations in counseling: school counseling and mental health counseling. The Ph.D. program in Counselor Education and Supervision is also CACREP accredited. Some courses are offered for undergraduates interested in school counseling, group work, leadership, and student affairs work. Undergraduates interested in preparing for entry into graduate work in counseling are invited to consult with program faculty prior to graduation. Program information is available on the Web site.

Degrees Offered

- M.S. in Counseling, Option:
Mental Health Counseling
- M.S. in Counseling, Option:
School Counseling
- Ph.D. in Counselor Education
and Supervision

Program Specific Admission Requirements

For master's applicants:

- Summary of academic background
- Personal statement
- Three letters of recommendation
- Current professional resume
- Transcripts
- International, non-native English speaking applicants: TOEFL scores of at least 80 for the online exam (with at least 20 on each subset) or 6.5 on the IELTS (minimum of 6 in each subset; scores must be within at least two years

In order to be considered for admission, applicants must meet the following minimum requirements:

- Bachelor's degree from a regionally accredited institution with a minimum GPA of 3.000 on 4.000 scale

For doctoral applicants:

- Transcripts
- GRE scores within the last five years; minimum scores are 151 Verbal and 153 Quantitative Reasoning
- Three letters of recommendation
- Personal self-statement
- Current academic resume
- International, non-native English speaking applicants: TOEFL scores of at least 80 for the online exam (with at least 20 on each subset) or 6.5 on the IELTS (minimum of 6 in each subset; scores must be within at least two years

In order to be considered for admission, applicants must meet the following minimum requirements:

- Master's degree in Counseling
- Bachelor's degree from a regionally accredited institution with a minimum GPA of 3.000 on 4.000 scale.

Program Specific Graduate Assistantships

Assistantships are usually available for doctoral students. Master's students sometimes qualify for assistantships. Please contact the program at (307) 766-2366 for assistantship opportunities, and see school web site.

Program Specific Degree Requirements

Professional Master's Program

- Minimum requirements:
same for all options
- 61 hours of graduate credit to include
40 hours of core courses and 21
hours of graduate coursework
specific to chosen option
- Culminating internship activity
guided by faculty advisor
- Students complete the CAPP program
in lieu of a program of study

Program Requirements

Core Courses

CNSL 5060 Counseling Ethics and Professional Issues.....	3
CNSL 5110 Group Procedures.....	3
CNSL 5140 Counseling and Addictions.....	3
CNSL 5170 Career Across the Lifespan.....	3
CNSL 5175 Human Growth and Development.....	3
CNSL 5180 Assessment in Counseling.....	3
CNSL 5200 Couples & Family Theory & Application.....	3
CNSL 5210 Group Experience.....	1
CNSL 5310 Pre-Practicum in Counseling.....	3
CNSL 5320 Practicum in Counseling.....	3
CNSL 5330 Counseling Children and Adolescents.....	3
CNSL 5340 Play Therapy.....	3
CNSL 5350 Multicultural Counseling.....	3
CNSL 5630 Trauma-Informed Counseling.....	3
CNSL 5640 Diagnosis, Psychopathology, & Psychopharmacology.....	3
CNSL 5650 Counseling Theories.....	3
EDRE 5530 Introduction to Research.....	3
Core Subtotal	49

School Counseling

CNSL 5120 School Counseling Strategies and Techniques.....	3
CNSL 5125 School Counseling II.....	3
CNSL 5580 Supervised Internship.....	6
Subtotal	12

Mental Health Counseling

CNSL 5130 Mental Health Counseling.....	3
CNSL 5150 Mental Health Counseling II.....	3
CNSL 5580 Supervised Internship.....	6
Subtotal	12

Minimum Total Credit Hours61

Program Core Requirements:

Core Courses

Doctor of Philosophy in Counselor Education and Supervision

Doctoral students are required to have completed a minimum of a 48-hour Master's degree from a program of study equivalent to a CACREP accredited Masters program in Counselor Education. These requirements are based upon the 2015 CACREP Standards.

Learning Outcome Areas Advanced Foundations

Ph.D. students with a 48-hour CACREP equivalent Master's degree are required to complete 12 semester hours of courses beyond their Master's preparation (in consultation with their adviser and committee). Ph.D. students with a 60-hour CACREP equivalent Master's program can petition up to 12 hours of their Master's coursework to fulfill this requirement.

Counseling and Supervision

CNSL 5340 Play Therapy.....	3
CNSL 5860 Doctorate Practicum in Counseling.....	6
CNSL 5865 Supervision Theory.....	3
CNSL 5875 Doctorate Practicum in Supervision.....	3

Teaching, Leadership and Advocacy

CNSL 5871 Doctoral Seminar I.....	3
CNSL 5872 Doctoral Seminar II.....	3
CNSL 5873 Doctoral Seminar III.....	3
CNSL 5874 Doctoral Seminar IV.....	3
PRST 5070 Intro to College Teaching.....	3
CNSL 5990 Internship.....	6

Research and Scholarship

12 credits chosen from the following (or equivalent) in consultation with major adviser and graduate committee.

EDRE 5600 Descriptive Research.....	3
EDRE 5610 Group Comp. Research.....	3
EDRE 5620 Correlational Research.....	3
EDRE 5630 Multivariate Research.....	3
EDRE 5645 Phenom Case Study & Grounded Theory.....	3
EDRE 5655 Ethnography & Narrative.....	3
EDRE 5650 Adv. Qual Research.....	3
EDRE 5670 Mixed Methods Research.....	3

Dissertation

PRST 5890 Dissertation Research.....	12
Total	72

Learner Outcomes

Master's Degree in Counseling

At the completion of the Master's degree in Counseling students will demonstrate the following learner outcomes:

1. Professional Competence & Academic Preparation for Licensed Professional Counselor (LPC): Students will demonstrate academic preparation by developing and completing an approved program of study that meets the standards set forth by the Council for Accreditation of Counseling and Related Educational Programs (CACREP).
2. Democratic Perspectives: Students will demonstrate development as a culturally competent, creative, skilled & ethical counselor.
3. Professional Identity: Students will develop a professional identity as a professional counselor including the areas of advocacy, leadership, social justice, and promoting caring communities.
4. Academic & Professional Goals: Students will demonstrate a clear vision of their professional and academic goals.

Ph.D. in Counselor Education & Supervision

Doctoral students in Counselor Education & Supervision will demonstrate the following learner outcomes.

1. Academic & Professional Goals: Students will demonstrate a clear vision of their professional and academic goals and academic preparation by developing and completing an approved program of study that meets the standards set forth by the Council for Accreditation of Counseling and Related Educational Programs (CACREP).
2. Professional Licensure: Students will obtain professional licensure as a Licensed Professional Counselor (LPC) in the state of Wyoming and/or develop a plan to obtain licensure for the state in which they intend to relocate upon graduation.
3. Democratic Perspectives: Students will demonstrate development as a culturally competent, creative, skilled & ethical counselor, supervisor and educator including the areas of advocacy, leadership, social justice, and promoting caring communities.
4. Research & Scholarship: Students will develop a professional identity as an academic researcher by demonstrating a clear and active research agenda that includes a plan of action for professional presentations and manuscripts.
5. Professional Development: Students will develop a clear and diligent plan to becoming a skilled, ethically competent counselor educator.

Counseling (CNSL)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1000. Relationship Skills: Counseling in Action. 3. [I,L◀▶(none)] Content-based course that focuses on the critical-thinking skills necessary to understand, analyze, and produce knowledge within the framework of educational inquiry; introducing students to the role of counseling in diverse settings. Themes discussed include classroom human relations skills, counseling in a diverse society, legal and ethical issues in human relations fields, and various specialties in the practice of counseling.

1101. First-Year Seminar. 3. [(none)◀▶FYS]
2200. Introduction to Student Leadership. 2. [CS,L◀▶(none)] Acquaints student leaders with skills and competencies necessary for successful service in the university community. (Normally offered each fall semester)

2300. Counseling Skills for the Helping Professions. 3. Presents instruction and practice in basic counseling and communication skills. Emphasizes listening, responding, encouraging and initiating change in interpersonal communication through mediation and conflict resolution. *Prerequisites:* sophomore standing; permission of Coordinator of Counselor Education program.

2800. Undergraduate Seminar in: __. 1-3 (Max. 9). Reserved for academic course work related to student interest in classes associated with examining the discipline of counseling from many varied perspectives. *Prerequisite:* Declared major in the social sciences, human services, or education.

3010. Student Leadership Strategies. 2. Develops skills and competencies requisite to effective leadership. Provides student leaders with skills they will profit from, both while enrolled at the university and later in their chosen careers. (Normally offered each spring semester)

4520. Fundamentals of Counseling (B) 3. Students learn some of the skills of counseling and develop an understanding of elementary principles of counseling theory, as well as a better understanding of themselves in relation to other people. Dual listed with CNSL 5520. *Prerequisites:* junior standing; 6 hours of educa-

tion or psychology and graduate standing to receive graduate credit. (Offered on campus and online all semesters)

4620. Organization and Administration in Student Affairs. 3. An introduction to college student affairs practice, specifically exploring issues related to the organization and administration of student personnel services. Explores the history, the philosophy, and the skills utilized in student personnel services within the context of various higher education institutions and settings. *Prerequisite:* department consent.

5020. Workshop. 1-4 (Max. 99). Usually offered only during summer sessions, this course provides an opportunity for special consideration on particular areas of counseling or pupil personnel services. *Prerequisite:* graduate standing, nine hours of education or behavioral science.

5030. Short Course. 1-2 (Max. 12). Provides opportunities for intensive study of some specific topic or set of topics in personnel work, to meet the special needs of a group of students with common interests. No more than six hours may be applied to any one degree program. *Prerequisite:* graduate standing and 6 hours in education and/or behavioral sciences.

5040. Relationship Skills. 3. Designed to help students and administrators develop their human relation skills to improve interpersonal effectiveness and communication as related to generic life skills. *Prerequisite:* 12 hours of education and/or psychology.

5060. Counseling Ethics and Professional Issues. 3. Designed to provide students with a philosophical base for making ethical decisions in the professional situations they encounter. In addition, it involves a chance to discuss many specific ethical and professional issues that are commonly encountered in the profession. *Prerequisite:* program admission or consent of instructor.

5110. Group Procedures. 3. Designed as an introduction to group work used in various organizational settings. Basic group techniques and procedures are covered using lecture/discussion methods, video, observation, and participation in practicing group leadership skills. Participation in a group experience during the course is required. *Prerequisites:* CNSL 4520/5520, six semester hours of education and/or psychology, consent of instructor, and graduate standing.

5120. School Counseling. 3. Provides specialized training for individuals preparing to be school counselors at levels K-12. *Prerequisite:* graduate standing.

5125. School Counseling II. 3. Explores the leadership role of the professional school counselor within the P-12 school setting and focuses on skills and experiences related to equity, advocacy, and social justice for systemic change, as well as program development, implementation and evaluation. *Prerequisites:* Graduate standing, program admission and CNSL 5120.

5130. Mental Health Counseling. 3. Encompasses specific counseling and professional development issues encountered by licensed counselors working in mental health agencies or private practice. Understanding the nature of the clientele and the issues, strategies for resolving client difficulties, collaborative practice, ethics, advocacy, knowledge and skills related to diversity and social justice are considered. *Prerequisites:* enrollment in Counselor Education program, successful completion or enrollment in CNSL 5060, 5650 and 5310.

5140. Counseling & Addictions. 3. Focuses on students acquiring specialized knowledge of assessment and multi-disciplinary treatment of chemical and other addictions. *Prerequisite:* six hours in administration of justice, psychology, sociology, or social work at the 4000 or 5000 level.

5150. Mental Health Counseling II. 3. Explores the leadership role of the professional counselor within a variety of mental health settings. Areas of application include program development, best practices, management, evaluation, consultation, social justice and supporting client advocacy. *Prerequisites:* graduate standing, program admission and CNSL 5130.

5170. Counseling and Career Across the Lifespan. 3. Offers an overview of human lifespan functioning with a primary focus on psychosocial development and counseling and career development across the lifespan. Additionally, this course presents the opportunity to examine the role of career and its influences on personal development.

5175. Human Growth and Development. 3. Provides an understanding of the nature and needs of individuals at all developmental levels, across the entire lifespan, and in diverse multicultural contexts through addressing theories of individual and family development, transitions across the life span, theories of learning, personality development, and neurobiological behavior. *Prerequisites:* Instructor permission and bachelors degree.

5180. Assessment in CNSL. 3. Emphasis is on counselor development for facilitating client self-understanding through the application of various assessment procedures and knowl-

edge about educational information systems and tools. *Prerequisite:* graduate standing, 15 hours in education and/or behavioral sciences.

5200. Couple and Family Theory. 3. Provides students with a foundation in conceptualizing and working with couple and family systems. Areas to be addressed include the history of couple and family counseling, ethical issues, professional orientation and an introduction to major systems theories. Participants are expected to explore their own family of origin. *Prerequisite:* admission to program.

5210. Group Experience. 1. Designed to provide a structured growth group experience through both in-class experience and reading. It is designed for students involved in human relationship fields. In-class groups are led by advanced group counseling students under the supervision of the faculty instructor. *Prerequisites:* graduate standing and consent of instructor.

5310. Pre-Practicum. 3. The first semester of a one-year sequence focused on learning, developing and practicing the fundamental process of counseling. Students do role-playing and have supervised experience with clients in a laboratory setting. Individual supervision is provided. Individual, live and observation of supervision is extensive. *Prerequisite:* graduate standing, program approval.

5320. Practicum. 3. Second course in a two semester sequence which includes class work, supervised counseling with clients in laboratory, extensive individual, group, live and observational supervision. *Prerequisites:* graduate standing, CNSL 5310, program approval.

5330. Counseling Children and Adolescents. 3. Students increase knowledge and skills in the processes of counseling children and adolescents. *Prerequisite:* six hours in education and/or behavioral sciences.

5340. Play Therapy. 3. Provides students with an overview of the field of play therapy. The historical roots of play therapy and the importance of play in child development will be explored. Various play therapy theories and techniques for assessment and intervention and professional issues will be surveyed. *Prerequisite:* graduate standing or consent of instructor.

5341. Play Therapy and Expressive Arts. 3. This course is designed to provide students with an introduction to child-centered play therapy and expressive arts. Students will leave with an understanding of child-centered play therapy and how to facilitate and process a variety of expressive arts activities with clients throughout the lifespan. *Prerequisite:* Acceptance to the Online Play Therapy Certificate Program or consent of the instructor.

5342. Theoretical Models of Play Therapy.

1. This course is designed to provide students with an overview of the field of play therapy theories and practices. Various play therapy theories and techniques for assessment and intervention will be surveyed with the intent of students developing a personal style for providing play therapy. *Prerequisite:* CNSL 5341 or consent of the instructor.

5343. Filial and Family Play Therapy. 3. Students will develop an understanding of the theoretical concepts of the filial play therapy. Students will gain the necessary skills to organize, implement, structure and facilitate filial therapy and family play therapy sessions. Conducting a filial group is essential to this course, current professional liability insurance is required. *Prerequisite:* CNSL 5341, CNSL 5342 or consent of the instructor.

5350. Multicultural Counseling. 3. Increases counselor competency and skills with diverse clients. *Prerequisite:* admission to the UW counseling program.

5510. Trends and Issues. 1-4 (Max. 4). This course is used from time to time as a systematic means for students to explore a developing trend or issue related to personnel services. Students make in-depth studies of one or more issues, trends, practices, and applications, under the supervision of one or more instructors. *Prerequisite:* graduate standing, and 15 hours in education and/or behavioral sciences.

5520. Fundamentals of Counseling. 3. Beginning course in the basis and process of counseling. Exposes students to some of the skills of counseling and enables them to develop an understanding of the elementary principles of counseling theory as well as a better understanding of themselves in relation to other people. Dual listed with CNSL 4520. *Prerequisite:* 6 hours of education or psychology and graduate standing.

5580. Supervised Internship. 1-6 (Max. 16). Provides a capstone clinical experience, preparing graduates to enter the practice of counseling PK-12 schools, mental health settings, and student affairs services in higher education. Students engage in professional counseling activities at approved placement sites. *Prerequisites:* graduate standing, CNSL 5310, 5320 and consent of the designated field setting authority.

5610. Advanced Practice in Group and Family Counseling. 3. Designed to provide a theoretical framework for understanding group dynamics and family systems, as well as offer intervention guidelines, best practices, and supervised experience in group leadership and family counseling. *Prerequisites:* program admission and consent of instructor.

5630. Trauma-Informed Counseling. 3.

This capstone course helps prepare students to understand and work with clients around trauma issues in mental health and school settings. Previous learning will be reviewed and synthesized with knowledge about trauma-informed care across the lifespan, including psychological first aid. Research-based best practices, counselor wellness, and effective service delivery are emphasized. *Prerequisite:* graduate standing.

5640. Diagnosis, Psychopathology, and Psychopharmacology. 3.

Introduction to the etiology, prevention, and treatment of mental and emotional disorders. Includes a focus on the skills of biopsychosocial case conceptualization and treatment planning, and multi-axial differential diagnosis using the current edition of the Diagnostic and Statistical Manual. Also addresses basic classifications, indications and contraindications of common pharmacological interventions. *Prerequisite:* program consent.

5650. Counseling Theories. 2-3 (Max. 3).

Designed to increase understanding of major counseling theories, with an emphasis on the integration of theoretical and philosophical assumptions with personal viewpoints. *Prerequisites:* previous or concurrent enrollment in CNSL 4520/5520 or equivalent, admission to counseling program, consent of instructor.

5860. Doctoral Practicum in Counselor Education. 1-8 (Max. 8).

Enrollment is limited to five graduate students per instructor. In this practicum, advanced graduate students are given an intensive supervised experience in counseling students over an extended period of time. The actual counseling experience is supplemented by input and evaluation seminars for all enrollees and by supervisory conferences designed to improve sensitivity and skill in counseling. *Prerequisites:* admission to the doctorate program in counseling, mastery of basic interviewing and counseling skills, and consent of instructor.

5865. Supervision Theory. 3. Provides students with the theoretical, knowledge and research base of clinical supervision as it relates to the counseling profession. *Prerequisite:* CNSL 5860.

5870. Seminar. 1-6 (Max. 12). Advanced students work together intensively on current issues and problems and participate in systematic, critical interpersonal evaluation. Seminars are organized with various patterns of emphasis and provide for a variety of small group experiences related to curricular areas within the department. *Prerequisites:* consent of instructor and graduate standing.

5871. Doctoral Seminar I: Professional Identity and Ethics. 3.

The doctoral seminar course sequence provides a structure for collegial discussion and collaboration among counselor education doctoral students and faculty. Doctoral Seminar I focuses on counselor education identity development and professional ethics for future counselor educators. *Prerequisite:* Admission as a Counselor Education & Supervision PhD Student.

5872. Doctoral Seminar II: Diversity and Social Change. 3.

The doctoral seminar course sequence provides a structure for collegial discussion and collaboration among counselor education doctoral students and faculty. Doctoral Seminar II focuses on the role of diversity and social change in counselor education. *Prerequisite:* Admission as a Counselor Education & Supervision PhD Student.

5873. Doctoral Seminar III: Research, Assessment & Scholarship. 3.

The doctoral seminar course sequence provides a structure for collegial discussion and collaboration among counselor education doctoral students and faculty. Doctoral Seminar III focuses on the role of research, assessment and scholarship in counselor education. *Prerequisite:* Admission as a Counselor Education & Supervision PhD student.

5874. Doctoral Seminar IV: Leadership, Consultation and Advocacy. 3.

The doctoral seminar course sequence provides a structure for collegial discussion and collaboration among counselor education doctoral students and faculty. Doctoral Seminar IV focuses on the role of leadership, consultation and advocacy in counselor education. *Prerequisite:* Admission as a Counselor Education & Supervision PhD Student.

5875. Doctoral Practicum in Supervision. 1-6 (Max. 6).

Designed to provide the prospective counseling educator or supervisor with an understanding of the learning process in counseling and the supervisory behaviors requisite for improving the competencies and professional growth of counselors. Specialized knowledge, skills, and attitudes related to the act of supervising are supplemented by various methods and techniques such as videotape, films, film-tape synchronization, simulation material, role-playing, group dynamics, communication games, interpersonal recall, interaction and content analysis, and micro-counseling. *Prerequisites:* CNSL 5860, graduate standing, and consent of instructor.

5880. Special Problems. 1-9 (Max. 9). Provides a broad perspective through selected reading material. Wherever possible the student collects and uses original information

from a practical work situation. All work is done independently under the direction of a faculty member. A minimum of three conferences are held as necessary to assure successful completion of the project. *Prerequisites:* consent of instructor and program, and graduate standing.

5959. Enrichment Studies. 1-3 (Max. 99).

Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

Higher Education Administration

The Program

The Higher Education Administration program serves the formal academic leadership development needs of persons aspiring to become managers and leaders in higher education institutions. These managers and leaders include coordinators, directors, deans and executive leaders at community colleges and universities.

This concentration offers the following graduate degrees in education: community college leadership certificate, master of arts (M.A.), doctor of education (Ed.D.), and Philosophy of Education (Ph.D). The certificate program requires 15 credits beyond a master's degree. The master's program requires 33 credit hours beyond the bachelor's degree and is available online. The Ed.D. is the terminal professional degree in education designed for students who desire to improve their professional practice as educators. The Ed.D. requires a minimum of 75 semester hours beyond the bachelor's degree. A bachelor's and master's degree is required of all students to be admitted to an Ed.D. program. Candidates may, with the approval of the faculty, transfer up to 30 semester hours from previous course work.

Graduate study addresses the challenges faced by institutions and agencies in the design and delivery of post secondary education and the preparation of educators to meet these challenges.

Career Options

Graduates are employed specifically as faculty and administrators in community colleges and universities, adult learning consultants, and continuing professional educators.

Program Specific Degree Requirements Certificate Program

The Community College Leadership Certificate Program requires 15 credit hours to include the following three required courses: HIED 5660 Community College; HIED 5600 Higher Education Finance; and HIED 5650 Law of Higher Education). Two elective courses are chosen from the following: HIED 5260 Educational Issues in Race, Class, & Gender; HIED 5630 Advanced Organizational Leadership; HIED 5640 Leadership Development; HIED 5670 Community College Issues & Leadership; and HIED 5680 Issues in Higher Education.

Program Specific Degree Requirements Master's Program

Master of Arts in Education, Option: Higher Education

The M.A. program is a professional degree program that does not require a Plan A (thesis) or Plan B.

Required Courses	Hrs.
EDRE 5530 Introduction to Research.....	3
HIED 5000 Community College Leadership	3
HIED 5020 Higher Education Systems.....	3
HIED 5030 Noncredit Education Systems ..	3
HIED 5040 Higher Education Staffing.....	3
HIED 5050 Workforce Training.....	3
HIED 5060 Program Budgets and Instruction	3
HIED 5240 Teaching Adults	3
HIED 5610 Planning and Evaluation	3
HIED 5660 Community College	3
HIED 5090 Capstone.....	3

Program Specific Degree Requirements

Doctor of Education (Ed.D.) in Education, Option: Higher Education Administration

The Ed.D. is the terminal professional degree in education designed for students who desire to improve their professional practice as educators. The Ed.D. is delivered through distance delivery system and requires a minimum of 77 semester hours beyond the bachelor's degree, of which 41 hours must be taken in the student's chosen field, and 6 hours of dissertation. Candidates may, with the approval of the faculty, transfer up to 30 semester hours from previous graduate level coursework. A bachelor's degree and a master's degree are required of all students to be admitted to the Ed.D. program.

Required on-campus orientation during first fall semester.

Program Specific Degree Requirements

Doctor of Philosophy (Ph.D.) in Education, Option: Higher Education Administration

The Ph.D. is a terminal professional degree in education designed for students who want to work as a faculty member in higher education. The Ph.D. requires 81 semester hours beyond the bachelor's degree, of which 39 hours must be taken in the student's chosen field including research courses, and 12 dissertation hours. Candidates may, with the approval of the faculty, transfer up to 30 semester hours from previous graduate level coursework. A bachelor's degree and a master's degree are required of all students to be admitted to the Ph.D. program.

Program Specific Admission Requirements

For certificate applicants:

- Letter of interest
- Current academic resume
- Three letters of recommendation
- Transcripts
- International, non-native English speaking applicants: TOEFL scores of at least 80 for the online exam (with at least 20 on each subset) or 6.5 on the IELTS (minimum of 6 in each subset; scores must be within at least two years
- Bachelor's degree from a regionally accredited institution with a minimum GPA of 3.000 on 4.000 scale

For master's applicants:

- Personal statement
- Current academic resume
- Three letters of recommendation
- Transcripts
- GRE scores within the last five years (both official and unofficial); minimum scores are 151 Verbal, 153 Quantitative Reasoning, and 4.0 Analytical Writing
- International applicants: TOEFL scores of at least 80 for the online exam (with at least 20 on each subset) or 6.5 on the IELTS (minimum of 6 in each subset; scores must be within at least two years

In order to be considered for admission, applicants must meet the following minimum requirements:

- Bachelor's degree from a regionally accredited institution with a minimum GPA of 3.000 on 4.000 scale

For EdD applicants:

- Personal statement
- Current academic resume
- Three letters of recommendation
- Transcripts
- GRE scores within the last five years (both official and unofficial); minimum scores are 153 Verbal, 144 Quantitative Reasoning, and 4.0 Analytical Writing
- International applicants: TOEFL scores of at least 80 for the online exam (with at least 20 on each subset) or 6.5 on the IELTS (minimum of 6 in each subset; scores must be within at least two years

In order to be considered for admission, applicants must meet the following minimum requirements:

- Bachelor's degree from a regionally accredited institution with a minimum GPA of 3.000 on 4.000 scale

For Ph.D. applicants:

- Personal statement
- Current academic resume
- Three letters of recommendation
- Transcripts
- GRE scores within the last five years (both official and unofficial); minimum scores are 151 Verbal, 153 Quantitative Reasoning, and 4.0 Analytical Writing
- International applicants: TOEFL scores of at least 80 for the online exam (with at least 20 on each subset) or 6.5 on the IELTS (minimum of 6 in each subset; scores must be within at least two years

In order to be considered for admission, all applicants must meet the following minimum requirements:

- Bachelor's degree from a regionally accredited institution with a minimum GPA of 3.000 on 4.000 scale

Program Specific Graduate Assistantships

Applicants interested in a Graduate Assistantship must submit a graduate assistantship application to the College of Education no later than February 1 for fall term admission (see above).

Learner Outcomes

1. **Academic Knowledge:** Students will demonstrate a deep understanding of knowledge related to the nature, function and scope of adult and continuing education; historical, philosophical and sociological foundations; adult learning and development; program processes including planning, delivery, and assessment/evaluation.
2. **Practical Competence:** Students will demonstrate the ability to translate academic knowledge into expert practice related to their professional roles and specialized areas of interest.
3. **Reflective Inquiry:** Students will demonstrate a reflective stance toward their professional practice and competence with diverse, critical and global perspectives and key tools of inquiry related to this field of study.
4. **Democratic Commitment:** Students will demonstrate an understanding of the relationship between adult and continuing education and the complex process of democracy and a commitment to pursue this process with a focus on equal learning opportunities.
5. **Professional Engagement:** Students will demonstrate intellectual engagement with adult and continuing education practices through creative and scholarly pursuits, participation in professional associations, and related activities.

Adult Education (ADED)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

- 1008. Eastern Thought Western Practice. 2. [I♦(none)]** Major concepts of Eastern thought from Confucius and Osho are explored, examined, to understand eastern ways of perceiving reality, knowledge, and values. Hands-on activities are employed to experience and practice the applications of the concepts. Students are challenged to critically think, analyze, and compare with their own, increase their consciousness of diversity.
- 5050. Learning Theories for Education. 3.** Learning and development theories are essential for educators who are designing and implementing educational applications and opportunities. Topics covered include orientations toward learning, motivation, life transitions, cognition, learning how to

learn, self-directed learning, and strategies for improving learning in educational contexts.

Prerequisite: graduate standing.

5880. Special Problems in Adult Education. 1-6 (Max. 9). Provides a broad perspective through selected reading material. Wherever possible, the student collects and uses original information from an adult education/instructional technology setting. All work is done independently under the direction of a faculty member. *Prerequisite:* graduate standing.

5890. Seminar in Adult Education. 1-6 (Max. 8). Advanced students in education work together intensively on current issues and problems relevant to adult education and participate in systematic, critical interpersonal evaluation. Eight hours are permitted on a doctoral program. *Prerequisite:* graduate standing.

Higher Education (HIED)

5000. Community College Leadership. 3. This course will introduce students to the challenges associated with instructional leadership at the community college. The course will identify and distinguish the macro (organizational) level of change but also the micro (individual) level of change in community college settings. *Prerequisite:* Admission into MA program.

5020. Higher Education Systems. 3. The purpose of this course is to provide students with an overview of higher education as an industry, as a cultural institution, and social stability while also promoting social mobility. Special focus is given to the stratification and diversity of American higher education. *Prerequisite:* Admission into MA program.

5030. Noncredit Education Systems. 3. This course will introduce graduate students to the main issues, trends, and problems that have defined the field of noncredit education systems. The course will also provide students with the foundational knowledge and skills needed to administer continuing and professional systems. *Prerequisite:* Admission into MA program.

5040. Higher Education Staffing. 3. This course provides students with a theoretical and practical overview of the research and best practices associated with the development of instructional staff at higher education institutions. Special attention is given to the use of mentoring higher education instructional staff. *Prerequisite:* Admission into MA program.

5050. Workforce Training. 3. In this course, students study the process of preparing objectives, retaining instructional staff, defining content, selecting learning activities, and evaluating student learning in workforce edu-

cation programs delivered by higher education institutions. *Prerequisite:* Admission into MA program.

5060. Program Budgets and Instructions. 3. The purpose of this course is to familiarize managers with the core tasks needed for effective financial planning. Students are also introduced to the budgeting process in various public higher education institutions. *Prerequisite:* Admission into MA program.

5090. Masters Capstone. 3. Provides exposure to situations students will likely encounter professionally. It establishes a forum where students apply and refine theories, principles, and skills learned during their programs. Students examine and critique current scholarship and document general degree specific competencies. Cross listed with ITEC 5090. *Prerequisites:* Check with advisor and complete required sequence of courses for Educational Administration (Adult and Postsecondary Education) or Instructional Technology masters degree programs prior to enrollment.

5240. Teaching Adults. 3. Developed upon the premise that individuals teach as they would expect to be taught. Focuses on methods for teaching adults in formal as well as informal settings. The learning styles literature is reviewed and implications for instructional settings are analyzed. Participants also critique their teaching performance through videotaped sessions. *Prerequisite:* graduate standing.

5260. Educational Issues Race, Class, and Gender. 3. Designed to help participants examine the current issues and debates in the literature of race, class, and gender from theoretical and practical perspectives. Related areas of ethnicity, national origin, sexual orientation, language, physical appearance, body size, and other constructs of difference will also be addressed. *Prerequisite:* graduate standing.

5600. Higher Education Finance. 3. Provides an overview of the economics and finance of higher education in the United States with an emphasis on the analysis of financial policies and current issues at the institutional, state, and national levels. *Prerequisite:* Admission to the program.

5610. Planning and Evaluation of Instructional Systems. 3. Participants investigate the concepts, issues, methods, and attitudes involved in the planning and evaluation of instructional systems. Topics covered include planning processes, theory and technique, promotion, evaluation, setting objectives, and trend analysis. *Prerequisite:* graduate standing.

5630. Advanced Organizational Leadership. 3. Examines central issues in advanced organizational leadership to prepare practitioners for leadership roles in educational set-

tings. Working individually and as a member of a group, students will conduct conceptual analyses and complete a literature review paper and an organizational case study. *Prerequisite:* Admission to the program.

5640. Leadership Development. 3. Examines central issues in the internal dimension of leadership to prepare leaders in postsecondary educational settings. Working individually and as a member of a group, students will conduct conceptual analyses and complete a literature review paper and a biographical case study of a postsecondary educational leader. *Prerequisite:* Admission to the program.

5650. Law of Higher Education. 3. Examine specific legal issues encountered by instructional leaders in higher education settings. Critically examines the basic rights and duties of institutional employees and students. It also explains when and how instructional leaders should refer matters to legal counsel. *Prerequisite:* Admission to the program.

5660. Community College. 3. Concerns the philosophy, organization, program, and administration of the community college. *Prerequisite:* graduate standing and consent of instructor.

5670. Community College Issues and Leadership. 3. Examine, analyze, the primary responsibility of instructional leaders at the community college, management of the curriculum. In particular, focus on the remedial/developmental education programs, general education, the liberal arts transfer curriculum, technical education, and noncredit and contract training programs. *Prerequisite:* Admission to the program.

5680. Issues in Higher Education. 3. Through examination of historical foundations and current trends, ADED 5680 delves into pressing issues in the academy, including but not limited to topics of tenure, governance, professional colleges, access and equity, curriculum and international needs. *Prerequisite:* graduate standing.

Educational Leadership

The curriculum in educational leadership is designed to prepare superintendents, principals, supervisors for public schools and leaders for organizations to perform duties of a specialized nature and to function effectively in a leadership capacity. The program provides sufficient breadth to give candidates for advanced degrees ample opportunity to develop essential competencies.

Degrees and Certificates Offered

Students who major in education with an option in educational leadership may choose one of the following certificate or degree programs: Principal Certificate program for eligibility of a K-12 Principal Certificate endorsement, School District Superintendent Certificate, Master of Arts in Education, Doctor of Education and Doctor of Philosophy.

Program Specific Admission Requirements

For certificate applicants:

- Transcripts
- Copy of current teaching certificate
- Principal program application
- Superintendent approval form
- Letter of intent
- Three letters of recommendation
- Current resume
- GRE scores within the last five years (both official and unofficial); minimum scores are 153 Verbal, 144 Quantitative Reasoning, and 4.0 Analytical Writing
- International, non-native English speaking applicants: TOEFL scores of at least 80 for the online exam (with at least 20 on each subset) or 6.5 on the IELTS (minimum of 6 in each subset; scores must be within at least two years
- Bachelor's degree from a regionally accredited institution with a minimum GPA of 3.000 on 4.000 scale
- Two years of K-12 teaching experience
- Master's degree in an education-related field

For master's applicants:

- Letter of intent
- Current resume
- Copy of current teaching certificate
- Principal program application
- Superintendent approval form
- Three letters of recommendation
- Transcripts
- GRE scores within the last five years (both official and unofficial); minimum scores are 153 Verbal, 144 Quantitative Reasoning, and 4.0 Analytical Writing

- International, non-native English speaking applicants: TOEFL scores of at least 80 for the online exam (with at least 20 on each subset) or 6.5 on the IELTS (minimum of 6 in each subset; scores must be within at least two years
- Bachelor's degree from a regionally accredited institution with a minimum GPA of 3.000 on 4.000 scale
- Two years of K-12 teaching experience

For EdD applicants:

- Application letter
- Current CV or academic resume
- Three letters of recommendation
- Transcripts
- GRE scores within the last five years (both official and unofficial); minimum scores are 151 Verbal, 153 Quantitative Reasoning, and 4.0 Analytical Writing
- International, non-native English speaking applicants: TOEFL scores of at least 80 for the online exam (with at least 20 on each subset) or 6.5 on the IELTS (minimum of 6 in each subset; scores must be within at least two years

In order to be considered for admission, applicants must meet the following minimum requirements:

- Bachelor's degree from a regionally accredited institution with a minimum GPA of 3.000 on 4.000 scale
- Two years of K-12 educational administrative experience

For PhD applicants:

- Application letter
- Current CV or academic resume
- Three letters of recommendation
- Transcripts
- GRE scores within the last five years (both official and unofficial); minimum scores are 151 Verbal, 153 Quantitative Reasoning, and 4.0 Analytical Writing
- International, non-native English speaking applicants: TOEFL scores of at least 80 for the online exam (with at least 20 on each subset) or 6.5 on the IELTS (minimum of 6 in each subset; scores must be within at least two years

In order to be considered for admission, applicants must meet the following minimum requirements:

- Bachelor’s degree from a regionally accredited institution with a minimum GPA of 3.000 on 4.000 scale
- Two years of K-12 educational administrative experience

Program Specific Degree Requirements

Principal Certificate program

The endorsement/certificate is 24 credits which includes the four core classes, 3 credits each: EDAD 5010, Leadership for Curriculum Development; EDAD 5020, Leadership for School Organization; EDAD 5030, Leadership for School and Community Relations; EDAD 5040, Leadership for Instruction; EDAD 5580, Supervised Internship, 6 credits; EDRE 5530 Intro to Research, 3 credits; and EDAD 5080, Intro to School Law, 3.

Program Specific Degree Requirements

Master’s program

The master’s is a 33 credit program which includes the four core classes, 3 credits each: EDAD 5010, Leadership for Curriculum Development; EDAD 5020, Leadership for School Organization; EDAD 5030, Leadership for School and Community Relations; EDAD 5040, Leadership for Instruction; EDAD 5580, Supervised Internship, 6 credits, EDEX 5720, Special Education Law, 3 credits, EDAD 5050, Leadership for Democratic Schools, 3 credits; EDAD 5150, Assessment, Accountability, and Student Learning, EDRE 5530 Intro to Research, 3 credits; and EDAD 5080 Introduction to School Law, 3 credits.

Program Specific Degree Requirements

Educational Leadership Doctoral Program (Ed.D.) (Including Superintendent Certificate)

Core Educational Leadership Courses

HIED 5630 Advanced Organizational Leadership3

EDAD 5600 Educational Leader as Manager of Human Resources.....3

EDAD 5650 Educational Leader as Communicator3

EDAD 5700 Educational Leader for Instruction3

EDCI 5720 Educational Leader as Change Agent3

EDAD 5750 Educational Leader for the Board and Community.....3

EDAD 5800 Educational Leader as Resource Manager.....3

EDAD 5815 Advanced School Law3

EDAD 5850 Educational Leader as Direction Setter3

Internship

EDAD 5580 Internship2

Educational Research Courses (at least 1 quantitative and 1 qualitative)

EDRE 5600 Educational Research 1: Descriptive Research3

EDRE 5610 Educational Research 2: Group Comparison3

EDRE 5620 Educational Research 3: Correlation3

EDRE 5640 Intro to Qual. Research.....3

EDRE 5645 Phenomenology, Case Study, and Grounded Theory in Qualitative Research3

EDRE 5655 Ethnography & Narrative Inquiry in Qualitative Research.....3

EDRE 5670 Mixed Methods Research3

EDRE 5870 Seminar in Qualitative Research3

Additional Requirements:

EDRE 5660 Dissertation/Thesis Prospectus Writing3

EDAD 5980 Dissertation Research.....6

Program Specific Degree Requirements

Doctor of Philosophy (Ph.D.) program

Minimum of 79 total credits required in the following areas:

Core courses (minimum of 9 credits)

All PhD option areas require PRST 5610, Intro to Doctoral Studies. In addition, doctoral students, with direction from their committees, will choose a minimum of two additional courses from the remaining five core courses: PRST 5900 (Practicum in College Teaching) EDCI 5600 (Diversity) EDCI 5810 (Writing for Publication) EDCI 5730 (Learning and Cognition) EDAD 5720 (Leader as Change Agent) EDRE 5660 (Dissertation/Thesis Prospectus Writing)

We also understand that students may meet the requirements for the core content in other ways, such as a master’s degree in an area that emphasizes coursework in diversity or multi-cultural education. Committees may determine that the requirements for additional course(s) have been met. However, Introduction to Doctoral Studies may not be waived.

Cognate courses and advanced courses (minimum 18 credit hours)

EDAD 5650 Educational Leader as Communicator3

EDAD 5720 Educational Leader as Change Agent3

EDAD 5850 Educational Leader as Director Setter3

HIED 5630 Advanced Organizational Leadership3

HIED 5680 Issues in Higher Education.....3

HIED 5600 Higher Education Finance.....3

Advanced research courses (minimum 12 credit hours).

All students are required to take at least one quantitative and one qualitative course from the following list:

EDRE 5600 Educational Research 1: Descriptive Research3

EDRE 5610 Educational Research Group Comparison Research.....3

EDRE 5620 Educational Research Correlational Research3

EDRE 5630 Educational Research 4: Multivariate Research3

EDRE 5640 Introduction to Qualitative Research3

EDRE 5645 Phenomenology, Case Study, and Grounded Theory in Qualitative Research3

EDRE 5655 Ethnography and Narrative Inquiry in Qualitative Research.....3

EDRE 5870 Seminar in Qualitative Research3

EDRE 5670 Mixed Methods Research3

Dissertation Hours

The required number of dissertation credits be a minimum of 12.

Preliminary exam (after coursework is completed): Guidelines determined by program, school, or committee

Program Outcomes: Written demonstration is required to show PhD outcomes are met (determined by program, school, or committee)

Dissertation (after preliminary exam): Guidelines determined by program, school, or committee

Notes:

These requirements for a PhD in Education are minimum requirements only. Students should check specific program options for additional requirements, including admissions criteria. Options approved prior to May 2013 may have different requirements.

Learner Outcomes

2011 ELCC District Level Standards

Standard 1.0: A district-level education leader applies knowledge that promotes the success of every student by facilitating the development, articulation, implementation, and stewardship of a shared district vision of learning through the collection and use of

data to identify district goals, assess organizational effectiveness, and implement district plans to achieve district goals; promotion of continual and sustainable district improvement; and evaluation of district progress and revision of district plans supported by district stakeholders.

1.1 Candidates understand and can collaboratively develop, articulate, implement, and steward a shared district vision of learning for a school district.

1.2 Candidates understand and can collect and use data to identify district goals, assess organizational effectiveness, and implement district plans to achieve district goals.

1.3 Candidates understand and can promote continual and sustainable district improvement.

1.4 Candidates understand and can evaluate district progress and revise district plans supported by district stakeholders.

Standard 2.0: A district-level education leader applies knowledge that promotes the success of every student by sustaining a district culture conducive to collaboration, trust, and a personalized learning environment with high expectations for students; creating and evaluating a comprehensive, rigorous, and coherent curricular and instructional district program; developing and supervising the instructional and leadership capacity across the district; and promoting the most effective and appropriate technologies to support teaching and learning within the district.

2.1 Candidates understand and can advocate, nurture, and sustain a district culture and instructional program conducive to student learning through collaboration, trust, and a personalized learning environment with high expectations for students.

2.2 Candidates understand and can create and evaluate a comprehensive, rigorous, and coherent curricular and instructional district program.

2.3 Candidates understand and can develop and supervise the instructional and leadership capacity across the district.

2.4 Candidates understand and can promote the most effective and appropriate district technologies to support teaching and learning within the district.

Standard 3.0: A district-level education leader applies knowledge that promotes the success of every student by ensuring the management of the district's organization, operation, and resources through monitoring and evaluating district management and

operational systems; efficiently using human, fiscal, and technological resources within the district; promoting district-level policies and procedures that protect the welfare and safety of students and staff across the district; developing district capacity for distributed leadership; and ensuring that district time focuses on high-quality instruction and student learning.

3.1 Candidates understand and can monitor and evaluate district management and operational systems.

3.2 Candidates understand and can efficiently use human, fiscal, and technological resources within the district.

3.3 Candidates understand and can promote district-level policies and procedures that protect the welfare and safety of students and staff across the district.

3.4 Candidates understand and can develop district capacity for distributed leadership.

3.5 Candidates understand and can ensure that district time focuses on supporting high-quality school instruction and student learning.

Standard 4.0: A district-level education leader applies knowledge that promotes the success of every student by collaborating with faculty and community members, responding to diverse community interests and needs, and mobilizing community resources for the district by collecting and analyzing information pertinent to improvement of the district's educational environment; promoting an understanding, appreciation, and use of the community's diverse cultural, social, and intellectual resources throughout the district; building and sustaining positive district relationships with families and caregivers; and cultivating productive district relationships with community partners.

4.1 Candidates understand and can collaborate with faculty and community members by collecting and analyzing information pertinent to the improvement of the district's educational environment.

4.2 Candidates understand and can mobilize community resources by promoting understanding, appreciation, and use of the community's diverse cultural, social, and intellectual resources throughout the district.

4.3 Candidates understand and can respond to community interests and needs by building and sustaining positive district relationships with families and caregivers.

4.4 Candidates understand and can respond to community interests and needs by building and sustaining productive district relationships with community partners.

Standard 5.0: A district-level education leader applies knowledge that promotes the success of every student by acting with integrity, fairness, and in an ethical manner to ensure a district system of accountability for every student's academic and social success by modeling district principles of self-awareness, reflective practice, transparency, and ethical behavior as related to their roles within the district; safeguarding the values of democracy, equity, and diversity within the district; evaluating the potential moral and legal consequences of decision making in the district; and promoting social justice within the district to ensure individual student needs inform all aspects of schooling.

5.1 Candidates understand and can act with integrity and fairness to ensure a district system of accountability for every student's academic and social success.

5.2 Candidates understand and can model principles of self-awareness, reflective practice, transparency, and ethical behavior as related to their roles within the district.

2011 ELCC Building Level Standards

Standard 1.0: A building-level education leader applies knowledge that promotes the success of every student by collaboratively facilitating the development, articulation, implementation, and stewardship of a shared school vision of learning through the collection and use of data to identify school goals, assess organizational effectiveness, and implement school plans to achieve school goals; promotion of continual and sustainable school improvement; and evaluation of school progress and revision of school plans supported by school-based stakeholders.

1.1 Candidates understand and can collaboratively develop, articulate, implement, and steward a shared vision of learning for a school.

1.2 Candidates understand and can collect and use data to identify school goals, assess organizational effectiveness, and implement plans to achieve school goals.

1.3 Candidates understand and can promote continual and sustainable school improvement.

1.4 Candidates understand and can evaluate school progress and revise school plans supported by school stakeholders.

Standard 2.0: A building-level education leader applies knowledge that promotes the success of every student by sustaining a school culture and instructional program conducive to student learning through collaboration, trust, and a personalized learning environment

with high expectations for students; creating and evaluating a comprehensive, rigorous and coherent curricular and instructional school program; developing and supervising the instructional and leadership capacity of school staff; and promoting the most effective and appropriate technologies to support teaching and learning within a school environment.

2.1 Candidates understand and can sustain a school culture and instructional program conducive to student learning through collaboration, trust, and a personalized learning environment with high expectations for students.

2.2 Candidates understand and can create and evaluate a comprehensive, rigorous, and coherent curricular and instructional school program.

2.3 Candidates understand and can develop and supervise the instructional and leadership capacity of school staff.

2.4 Candidates understand and can promote the most effective and appropriate technologies to support teaching and learning in a school environment.

Standard 3.0: A building-level education leader applies knowledge that promotes the success of every student by ensuring the management of the school organization, operation, and resources through monitoring and evaluating the school management and operational systems; efficiently using human, fiscal, and technological resources in a school environment; promoting and protecting the welfare and safety of school students and staff; developing school capacity for distributed leadership; and ensuring that teacher and organizational time is focused to support high-quality instruction and student learning.

3.1 Candidates understand and can monitor and evaluate school management and operational systems.

3.2 Candidates understand and can efficiently use human, fiscal, and technological resources to manage school operations.

3.3 Candidates understand and can promote school-based policies and procedures that protect the welfare and safety of students and staff within the school.

3.4 Candidates understand and can develop school capacity for distributed leadership.

3.5 Candidates understand and can ensure teacher and organizational time focuses on supporting high-quality school instruction and student learning.

Standard 4.0: A building-level education leader applies knowledge that promotes the success of every student by collaborating with faculty and community members, responding to diverse community interests and needs, and mobilizing community resources on behalf of the school by collecting and analyzing information pertinent to improvement of the school's educational environment; promoting an understanding, appreciation, and use of the diverse cultural, social, and intellectual resources within the school community; building and sustaining positive school relationships with families and caregivers; and cultivating productive school relationships with community partners.

4.1 Candidates understand and can collaborate with faculty and community members by collecting and analyzing information pertinent to the improvement of the school's educational environment.

4.2 Candidates understand and can mobilize community resources by promoting an understanding, appreciation, and use of diverse cultural, social, and intellectual resources within the school community.

4.3 Candidates understand and can respond to community interests and needs by building and sustaining positive school relationships with families and caregivers.

4.4 Candidates understand and can respond to community interests and needs by building and sustaining productive school relationships with community partners.

Standard 5.0: A building-level education leader applies knowledge that promotes the success of every student by acting with integrity, fairness, and in an ethical manner to ensure a school system of accountability for every student's academic and social success by modeling school principles of self-awareness, reflective practice, transparency, and ethical behavior as related to their roles within the school; safeguarding the values of democracy, equity, and diversity within the school; evaluating the potential moral and legal consequences of decision making in the school; and promoting social justice within the school to ensure that individual student needs inform all aspects of schooling.

5.1 Candidates understand and can act with integrity and fairness to ensure a school system of accountability for every student's academic and social success.

5.2 Candidates understand and can model principles of self-awareness, reflective practice, transparency, and ethical behavior as related to their roles within the school.

5.3 Candidates understand and can safeguard the values of democracy, equity, and diversity within the school.

5.4 Candidates understand and can evaluate the potential moral and legal consequences of decision making in the school.

5.5 Candidates understand and can promote social justice within the school to ensure that individual student needs inform all aspects of schooling.

Standard 6.0: A building-level education leader applies knowledge that promotes the success of every student by understanding, responding to, and influencing the larger political, social, economic, legal, and cultural context through advocating for school students, families, and caregivers; acting to influence local, district, state, and national decisions affecting student learning in a school environment; and anticipating and assessing emerging trends and initiatives in order to adapt school-based leadership strategies.

6.1 Candidates understand and can advocate for school students, families, and caregivers.

6.2 Candidates understand and can act to influence local, district, state, and national decisions affecting student learning in a school environment.

6.3 Candidates understand and can anticipate and assess emerging trends and initiatives in order to adapt school-based leadership strategies.

Standard 7.0: A building-level education leader applies knowledge that promotes the success of every student through a substantial and sustained educational leadership internship experience that has school-based field experiences and clinical internship practice within a school setting and is monitored by a qualified, on-site mentor.

7.1 Substantial Field and Clinical Internship Experience: The program provides significant field experiences and clinical internship practice for candidates within a school environment to synthesize and apply the content knowledge and develop professional skills identified in the other Educational Leadership Building-Level Program Standards through authentic, school-based leadership experiences.

7.2 Sustained Internship Experience: Candidates are provided a six-month, concentrated (9–12 hours per week) internship that includes field experiences within a school-based environment.

7.3 Qualified On-Site Mentor: An on-site school mentor who has demonstrated experience as an educational leader within a school and is selected collaboratively by the intern and program faculty with training by the supervising institution.

Educational Leadership (EDAD)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

1000. Schools and Democracy. 1. [I♦(none)] Content-based course focuses on critical-thinking skills necessary to understand, analyze, and produce knowledge within the framework of educational inquiry; introducing students to the themes of the agenda of the National Network for Educational Renewal which focuses on the purpose of schools in America.

5010. Leadership for Curriculum Development. 3. Focuses on leadership skills that support curriculum and curriculum development in student learning and achievement. Key topics include: K-12 curriculum alignment; incorporating standards and community values; curriculum development, implementation, and evaluation; equity and access for diverse learning needs; and effective communication about curriculum. *Prerequisite:* Admission to program or consent of instructor.

5020. Leadership for School Organization. 3. Focuses on organizational leadership. Topics include: history of organizational leadership, leadership styles, change process, strategic planning, federal, state, and local governance as well as politics, power and policy, and school operations, to include budget, facilities, scheduling, recruitment, selection and induction. *Prerequisite:* Admission to program or consent of instructor.

5030. Leadership for School and Community Relations. 3. Focuses on the leadership role of the principal in building relations with students, staff, family, and community. Topics include school culture and climate, community and family involvement, public relations and communications, student discipline, and crisis management. *Prerequisite:* admission to program or consent of instructor.

5040. Leadership for Instruction. 3. Focuses on the principal as instructional leader. Topics include: developing a school vision of learning; employing effective instructional strategies, supervision and evaluation of teacher performance; integration of supervision, evaluation, and student achievement with professional development and professional learning communities, and instructional trends and issues

within diverse learning communities. *Prerequisite:* Admission to program or consent of instructor.

5050. Leadership for Democratic Schools. 3. Designed to increase awareness of future school leaders of the principles of equity and excellence in education focused on democratic practices. Topics include democratic educational practices, ethical leadership, renewal of public schools, and educational leadership in urban, suburban, and rural communities, and in ethnically and socio-economically diverse settings. *Prerequisite:* graduate standing.

5060. Capstone in Educational Leadership. 3. Designed to assist the student in the creation of their master's program final project, which will be used as the written demonstration of mastery of the course outcomes as well as meeting the educational leadership (ELCC) standards. *Prerequisite:* complete Core (EDAD) courses.

5080. Introduction to School Law. 3. This course provides legal foundations of U.S. public schools and examines general principles of statutory and case law and applies judicial decisions to educational environments. Additionally, the course focuses on legal responsibilities, constraints, and opportunities for school leaders. *Prerequisite:* admission into UW Educational Administration, K-12.

5150. Assessment, Accountability, and Student Learning. 3. Focuses on the knowledge and skills necessary to lead schools in the alignment of standards, assessment, and instruction. Topics include analysis and interpretation of assessment results and educational data, recent history and current context of educational accountability in Wyoming, role of assessment and accountability in improving student learning. *Prerequisite:* graduate standing.

5580. Supervised Internship in Educational Administration. 1-8 (Max. 12). Expand student knowledge by providing an intensive clinical experience in educational administration along with other activities that involve practical experiences with peers and with practising K-12 administrators. *Prerequisite:* Admission into the UW Educational Leadership Principal Certificate, Master's or EdD Doctoral program.

5600. Educational Leader as Manager of Human Resources. 3. Focuses on linking theory related to organizations (including Bureaucracy Theory), decision-making and organizational effectiveness with effective practices in management of organizational personnel. *Prerequisite:* graduate standing.

5650. Educational Leader as Communicator. 3. Focuses on inter- and intra-personal communication skills; group facilitation;

organization and community public relations; parent and community involvement; negotiation; and conflict management. *Prerequisite:* graduate standing.

5700. Educational Leader For Instruction. 3. Focuses on the study of curriculum development and implementation, instructional practice, assessment and staff development. *Prerequisite:* graduate standing.

5720. Educational Leader as Change Agent. 3. Focuses on the study of change theory, change processes, change dynamics, decision-making models, and implementation of change in the organization setting. *Prerequisite:* graduate standing.

5750. Educational Leader for the Board and Community. 3. Concentrates on the administrator as the leader of an organization's board and community. *Prerequisite:* graduate standing.

5800. Educational Leader as Resource Manager. 3. Focuses upon the successful management and operation of the organizations fiscal resources, facilities, and support services. Includes work in the areas of transportation, food service, funding and budget, compensation, facilities, legal issues, calendar, special education, and policy influence. *Prerequisite:* graduate standing.

5815. Advanced School Law. 3. Designed to provide advanced information concerning K-12 school law as it relates to public education. Students will acquire a deeper understanding of legal issues that routinely arise in the K-12 school setting. *Prerequisite:* Admission into the UW Educational Leadership EdD/PhD Doctoral Program.

5850. Educational Leader as Direction Setter. 3. Investigates how the educational leader can effectively create a futuristic vision and mission for the organization after assessing the existing culture and climate, and organizational readiness for change. *Prerequisite:* graduate standing.

5870. Seminar in Legal Issues. 1-6 (Max. 8). Advanced students in education work together intensively on current issues and problems relevant to educational administration and participate in systematic, critical interpersonal evaluation. Eight hours are permitted on a doctoral program. *Prerequisite:* consent of instructor and graduate standing.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes. *Prerequisite:* advanced degree candidacy.

Educational Research

The educational research faculty offer ten courses on a regular basis in educational research. These courses are open to graduate students throughout the college and the university. In addition, we offer two minors in educational research, one is qualitative research methods and one in quantitative research methods. Students currently enrolled in any UW master's or doctoral program are eligible for these minors. Both minors require students to complete 16 credit hours, a trial research project, and a co-teaching experience in educational research.

Learner Outcomes

The goals of the educational research courses in the College of Education include developing the necessary skills, concepts, and understanding of research methodology to evaluate, use, and conduct research in a student's specific discipline. This goal requires the ability to do the following:

1. In a research study, critique the following the research problem and hypothesis; general design to insure that correct conclusions are possible from the statistical analysis; statistical analysis procedures to establish their valid use in the study; reliability and validity of instruments used to collect data; and conclusions and interpretations to insure appropriateness of each.
2. Develop a problem appropriate for research. Examine a cross section of the current literature on the topic, placing the research problem within the context of the field.
3. Demonstrate knowledge of the reference sources available in a research library; know how and when to use available resources.
4. Compare and contrast research designs and methods and be able to identify examples, advantages, and disadvantages of each.
5. Be able to use statistics to describe a sample and make inferences.
6. Understand, design, and analyze results of various types of quantitative, qualitative, and mixed method research studies.
7. Understand the principles of measurement as they apply to specific studies.

Educational Research (EDRE)

5000. Educational Research. 3.

5530. Introduction To Research. 3. Basic concepts of educational research design, statistics, and measurement. The focus of the course is on reading and critiquing research articles, both quantitative and qualitative, and includes an introduction to statistics. Students learn to conduct a review of the literature relevant to a specific research problem. *Prerequisite:* graduate standing.

5550. Action Research. 3. Introduces experienced classroom teachers to action research methodology. Action research studies will be reviewed and critiqued. Students will learn to plan, implement, and write up an action research study conducted in a classroom setting. *Prerequisite:* graduate standing.

5580. Supervised Internship. 1-8 (Max. 12).

5600. Educational Research I: Descriptive Research. 3. Basic concepts of educational survey research design, statistics, and measurement. The focus is on descriptive statistics (measures of central tendency, variability, percent and frequency distribution, bivariate correlation, graphical displays, testing hypotheses about proportions). Students develop questionnaires and plan, conduct, and report on a survey study. *Prerequisite:* EDRE 5530.

5610. Educational Research: Group Comparison Research. 3. Concepts of experimental and ex post facto research designs, statistics, and measurement. The focus is on inferential statistics. Students construct attitude scales and other instruments used in research and they plan, conduct, and report on a group comparison study. *Prerequisite:* EDRE 5600.

5620. Educational Research: Correlational Research. 3. Concepts of correlational research, statistics, and measurement. Focus is on the design and analysis of results from correlational studies. Statistical topics include MANOVA, multiple regression, factor analysis, and discriminant analysis. Includes measurement topics in classical measurement theory and additional topics in validity and reliability. Plan, conduct, and report on a correlational study. *Prerequisites:* EDRE 5530 and 5600.

5630. Educational Research IV: Multivariate Research. 3. An advanced educational research, statistics, and measurement course. Design and analysis of results from studies with several dependent and independent variables. Includes multivariate statistics such as MANOVA, discriminant analysis, canonical correlation, multidimensional scaling, struc-

tural equation modeling, logit regression. Measurement topics include generalizability theory, item response theory, equating, and standard setting. *Prerequisites:* EDRE 5530, 5600, 5610, and 5620.

5640. Introduction to Qualitative Research. 3. This course introduces qualitative research. Students will explore the foundations, social science theories, methods, and processes of qualitative research and will learn to critically evaluate published research. Emphases will include basic design principles, trustworthiness, and analysis. Students will engage in original data collection and will produce a mini report. *Prerequisite:* EDRE 5530.

5645. Phenomenology, Case Study, and Grounded Theory in Qualitative Research. 3. In-depth examination of phenomenology (with great emphases on its philosophical roots), qualitative case study, and grounded theory. Characteristics of each qualitative tradition will be explored by way of critiquing published peer reviewed journal articles. Students will conduct and report on a mini study. *Prerequisites:* EDRE 5530 and EDRE 5640.

5655. Ethnography and Narrative Inquiry in Qualitative Research. 3. In-depth exploration of narrative inquiry (including autoethnography) and educational ethnography. Issues of ethics, politics, diversity, and the researcher's role will be integral to the course. Students will conduct and report on a mini study. *Prerequisites:* EDRE 5530 and EDRE 5640.

5660. Dissertation/Thesis Prospectus Writing. 3. Prepare graduate students to plan, develop, and write research proposals suitable for a dissertation/thesis. In consultation with the committee chair, students will focus on their own problem for research, conduct a literature review, choose appropriate methods for investigating the problem, and write a research proposal. Satisfactory/unsatisfactory only. *Prerequisites:* at least two of the following: EDRE 5600, EDRE 5610, EDRE 5620, EDRE 5630, EDRE 5640, EDRE 5645, EDRE 5655, EDRE 5670, or EDRE 5870.

5670. Mixed Methods Research. 3. Provide an overview of mixed methods research to graduate students who are already familiar with quantitative and qualitative research. Specifically, they will learn the definition, history and foundations, and specific types of mixed methods designs. Also plan a mixed methods research study. *Prerequisites:* EDRE 5600 and EDRE 5640.

5870. Seminar. 1-8 (Max. 8).

5890. Directed Professional Study. 1-6 (Max. 9).

5959. Enrichment Studies. 1-3 (Max. 99).

Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

Learning, Design, and Technology

The curriculum in learning, design, and technology is designed to assist professionals in effectively developing, implementing, and evaluating systems, tools, strategies, and environments that enhance learning. Graduates from the program secure employment in PK-12 classrooms; school media and technology centers, and school district administrative offices; public, corporate, and government centers and training agencies; college and university faculty and administrative positions; design and development labs; product support teams; and consulting firms.

Degrees and Certificates Offered

Students who major in education with an option in learning, design, and technology may choose one of the following certificate or degree programs: Master of Science in Education (M.S.), Doctor of Education (Ed.D.) or Doctor of Philosophy (Ph.D.), Online instruction Certificate program (does not lead to a master's degree). The program Web site (<http://www.uwyo.edu/clad/>) provides additional information.

Program Specific Admission Requirements

For certificate applicants:

- Application letter
- Transcripts
- International, non-native English speaking applicants: TOEFL scores of at least 80 for the online exam (with at least 20 on each subset) or 6.5 on the IELTS (minimum of 6 in each subset; scores must be within at least two years

In order to be considered for admission, applicants must meet the following minimum requirements:

- Bachelor's degree from a regionally accredited institution with a minimum GPA of 3.000 on 4.000 scale

For master's applicants:

- Transcripts
- Three letters of recommendation
- Personal statement
- Current academic resume
- International, non-native English speaking applicants: TOEFL scores of at least 80 for the online exam (with at least 20 on each subset) or 6.5 on the IELTS (minimum of 6 in each subset; scores must be within at least two years

In order to be considered for admission, applicants must meet the following minimum requirements:

- Bachelor's degree from a regionally accredited institution with a minimum GPA of 3.000 on 4.000 scale

For EdD applicants:

- Transcripts
- Three letters of recommendation
- Personal statement
- Current academic resume
- GRE scores within the last five years (both official and unofficial); minimum scores are 151 Verbal, 153 Quantitative Reasoning, and 4.0 Analytical Writing
- International, non-native English speaking applicants: TOEFL scores of at least 80 for the online exam (with at least 20 on each subset) or 6.5 on the IELTS (minimum of 6 in each subset; scores must be within at least two years

In order to be considered for admission, applicants must meet the following minimum requirements:

- Bachelor's degree from a regionally accredited institution with a minimum GPA of 3.000 on 4.000 scale

For PhD applicants:

- Transcripts
- Three letters of recommendation
- Personal statement
- Current academic resume
- GRE scores within the last five years (both official and unofficial); minimum scores are 151 Verbal, 153 Quantitative Reasoning, and 4.0 Analytical Writing

- International, non-native English speaking applicants: TOEFL scores of at least 80 for the online exam (with at least 20 on each subset) or 6.5 on the IELTS (minimum of 6 in each subset; scores must be within at least two years

In order to be considered for admission, all applicants must meet the following minimum requirements:

- Bachelor's degree from a regionally accredited institution with a minimum GPA of 3.000 on 4.000 scale.

Program Specific Degree Requirement

Online Instruction Certificate Program

The Online Instruction Certificate Program is a post-baccalaureate, credit bearing program that helps learners from all fields acquire necessary knowledge and skills to effectively develop and teach online courses in K-12, higher education, and business and industry settings. Courses familiarize learners with distance education and design theory to develop online materials that facilitate student access, engagement, communication, and information exchange. Emphasis is placed on tool use and the application of skills towards instructional development and implementation. The certificate program consists of 12 hours of coursework in four online courses: ITEC 5020 Technology and Distance Education; ITEC 5030 Introduction to Online Teaching; ITEC 5160 Introduction to Instructional Design (with an emphasis on online learning environments); ITEC 5510 Communication in Distance Education. Students who have been formally admitted to the Master of Science in Education with an emphasis in Instructional Technology may use certification courses to fulfill graduate degree requirements.

Program Specific Degree Requirement

Master of Science (M.S.) Program

The M.S. program gives students the foundations to design, develop, implement, and evaluate instructional resources and systems in professional learning environments. Students examine the history of technology-based training, instructional design, and distance education to understand current trends and procedures in the field. They apply this knowledge through the design and development of novel training solutions targeted to diverse professional settings (e.g., K-12 education, corporate and government centers, design and development labs, higher education).

Through these experiences, students learn how to identify gaps in desired and current practice, design training solutions to eliminate or bridge those gaps, develop tools and methods to implement solutions, and evaluate and revise methods for continued success. Emphasis is placed on instructional systems that use both face-to-face and distance delivery methods. Students can complete all of their coursework online with the exception of a campus visit for their final defense in the Capstone course.

The M.S program is a 33-credit hour professional degree program that does not require a Plan A (thesis) or Plan B. It includes the following degree requirements:

Required

- EDRE 5530, Introduction to Research (3 credits)
- ITEC 5000, Intro to the Field of Instructional Technology (3 credits)
- ITEC 5010, Instructional Technology (3 credits)
- ITEC 5020, Technology and Distance Education (3 credits)
- ITEC 5160, Introduction to Instructional Design (3 credits)
- ITEC 5350, Multimedia Development (3 credits)
- ITEC 5320, Message Design (3 credits)
- ITEC 5510, Communication in Distance Education (3 credits)
- ITEC 5550, Theory of Change (3 credits)
- ITEC 5560, Design/Development of Instructional Systems (3 credits)
- ITEC 5090, Masters Capstone course (3 credits)

Program Specific Degree Requirement

Doctor of Education (Ed.D.) Program

Required on campus orientation during first fall semester.

The Ed.D. is the terminal professional degree in education designed for students who desire to improve their professional practice as educators. The program moves beyond the foundations of distance education, instructional design, and technology integration to focus on advanced application and research. Students apply design, development, and evaluation principles to explore authentic challenges and develop real solutions in diverse settings (e.g., K-12 education, corporate and government centers, and higher education institutions). Through these experiences, students learn how to use advanced research methods to explore workplace problems, design and deliver solutions, and implement and evaluate change.

Emphasis is placed on in-depth mentoring and collaboration, advanced research, development of real-world applications, and training solutions offered through distance delivery platforms.

The Ed.D. program requires a minimum of 81 credit hours beyond the bachelor's degree. Candidates may, with the approval of the committee, transfer up to 30 credit hours from previous graduate-level coursework in a closely related field. The program is delivered online with the exception of some the spring residencies.

Program knowledge base: 48 credits

Research: 9 credits

Professional Writing: 6 credits

Electives: 12 credits

Dissertation: 6 credits

Program Specific Degree Requirement

Doctor of Philosophy (Ph.D.) Program

Residency requirement: Four consecutive full-time semesters on campus

The Ph.D. program prepares students for careers in academia. The program consists of: (1) systematic inquiry and research; (2) focused courses and professional experiences in education and related fields; and (3) teaching and other related activities tailored to individual career goals. Students work closely with an advisor and faculty committee to select courses, conduct research, and develop professional experiences.

Effective preparation for the Ph.D. stems from collaborative research and inquiry into topics of mutual interest by students and faculty. The program is structured around a cognitive apprenticeship model. Students spend a major portion of their program working with faculty members on shared research and scholarship.

The Ph.D. program requires a minimum of 81 credit hours beyond the bachelor's degree and includes the following requirements:

Professional courses: 15 credits

Program knowledge base: 30 credits

Research: 15 credits

Electives: 9 credits

Dissertation: 12 credits

Candidates may, with the approval of the committee, transfer up to 30 credit hours from previous graduate-level coursework in a closely related field.

For additional information about specific required courses for graduate degrees in education with an option in instructional technology, please visit the program Web site.

Learner Outcomes

1. Academic Knowledge: Students will demonstrate a deep understanding of knowledge related to the nature, function and scope of instructional technology; historical, philosophical and sociological foundations; research; and program processes including planning, development, delivery, and assessment/evaluation.
2. Design: Students will demonstrate how to determine organization and learner needs, specify conditions for learning, and conduct task analyses, instructional sequencing, delivery, and project and resource management. Students will also demonstrate how visual elements, information literacy, and delivery media affect message design in traditional and online environments.
3. Development: Students will demonstrate how to convert design plans into physical and computer-based resources aligned to professional learning goals, standards, and objectives. They will also demonstrate how to deliver these resources via physical and electronic media.
4. Evaluation: Students will demonstrate skills required to conduct both formative and summative assessments of instructional episodes and resources. These include problem analysis, expert review, usability testing, and instrument development and validation.
5. Practical Competence: Students will demonstrate the ability to translate academic knowledge into expert practice related to their professional roles and specialized areas of interest.
6. Professional Engagement: Students will demonstrate intellectual engagement and a reflective stance with instructional technology practices through creative and scholarly pursuits, advisor research, participation and presentations in professional associations, and related activities.

Learning, Design, and Technology (ITEC)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1101. First-Year Seminar. 3. [(none)▶FYS]
2360. Teaching with Technology. 1-3 (Max. 3). [L▶(none)] Introduction to effective utilization of computers and other instructional technologies for instruction; software/

hardware selection; integrated, professional and instructional applications as applied to all areas and levels of P-12 education. *Prerequisite:* minimum 2.500 cumulative UW GPA.

4010 [4120]. Instructional Technology. 3.

An introductory survey course in instructional technology. Covers psychological principles in communication theory, message design and instructional theory with emphasis on the application of technology toward achieving communications objectives. Includes hands-on experience with current presentation tools and techniques for a variety of instructional deliveries. Dual listed with ITEC 5010. *Prerequisite:* junior standing.

4030. Introduction to Online Teaching. 3.

Includes basic theory, techniques, strategies of teaching and managing the online environment. Covers foundations and domains of online teaching. Emphasizes online learning issues, topics, and practices. Builds a knowledge base in topics such as the selection and integration of distance learning technologies in teaching and providing learner support. Dual listed with ITEC 5030. *Prerequisite:* senior standing or 12 hours of education.

4220. Materials Production I. 2. The first in a series of laboratory experiences aimed at providing teachers, administrators and production specialists with skills in the design and production of instructional materials. Focuses on the basic processes (i.e. mounting, lettering, coloring, illustration, converting and duplicating). A materials fee will be assessed. May be used toward the practical and applied arts requirement. *Prerequisite:* ITEC 4120. (Offered based on sufficient demand and resources)

4340 [4400]. Technology Integration in Teaching. 3.

This course is an intermediate practice in theory and application of integrating instructional technology into all types of classroom settings. Issues and topics include teaching and learning with technology, designing materials and activities for use with various technologies, and the role that technology plays in the delivery of instruction. *Prerequisite:* ITEC 2360 or equivalent.

4740. Field Studies In _____. 1-5 (Max. 12).

This course is offered only through extension services. It is broad and flexible and can be utilized in numerous situations to meet local needs. Credit in this course is not applicable toward advanced degrees. *Prerequisite:* junior standing. (Please note that any course offered by the College of Education with the number 4740 is not applicable toward advanced degrees)

5000. Intro to the Field of Instructional Technology. 3. This course details faculty expectations and students' responsibilities in

instructional technology graduate degree programs. It builds a knowledge base about program milestones, library research, APA writing guidelines, academic journals, and professional opportunities. ePortfolios are introduced and initiated to assess student progress over time. *Prerequisite:* graduate standing in Instructional Technology.

5010. Instructional Technology. 3. An introductory survey course in instructional technology. Covers psychological principles in communication theory, message design and instructional theory with emphasis on the application of technology toward achieving communications objectives. Includes hands-on experience with current presentation tools and techniques for a variety of instructional deliveries. Dual listed with ITEC 4010. *Prerequisite:* junior standing.

5020. Technology and Distance Education. 3. A survey of the uses of telecommunication systems and other technologies in distance education. Covers instructional strategies, management concerns, and special issues associated with distance learning programs. *Prerequisite:* graduate standing and consent of instructor.

5030. Introduction to Online Teaching. 3. Includes basic theory, techniques, strategies of teaching and managing the online environment. Covers foundations and domains of online teaching. Emphasizes online learning issues, topics, and practices. Builds a knowledge base in topics such as the selection and integration of distance learning technologies in teaching and providing learner support. Dual listed with ITEC 4030. *Prerequisite:* senior standing or 12 hours of education.

5070. Trends In Instructional Technology. 1-3 (Max. 6). Provides reading, discussion, research and the opportunity to critically appraise potential methods, software, and hardware in the field of educational communications and technology. *Prerequisite:* 12 hours of education, graduate standing, and consent of instructor.

5090. Masters Capstone. 3. Provides exposure to situations students will likely encounter professionally. It establishes a forum where students apply and refine theories, principles, and skills learned during their programs. Students examine and critique current scholarship and document general degree specific competencies. Cross listed with ADED 5090. *Prerequisites:* Check with advisor and complete required sequence of courses for Educational Administration (Adult and Postsecondary Education) or Instructional Technology masters degree programs prior to enrollment.

5120. Media Workshop. 1-6 (Max. 6). Specialized experience in selected areas such as computer technology, multi-image, slide/tape, audio and instructional design. Emphasizes experimental use of materials and development of learning software. The workshop is provided on demand and is flexibly organized and scheduled to meet prevailing needs. *Prerequisite:* ITEC 4220.

5160. Introduction to Instructional Design. 3. An introduction to theory and practice of instructional design. Intensive study of the instructional design process and application of the process to solve an instructional problem. *Prerequisite:* graduate standing.

5320. Message Design. 3. Introduces theoretical framework and skills necessary to evaluate and create visual representations of information. Topics of application include visual literacy, learning theories, instructional design, instructional technology, and information presentation. *Prerequisite:* graduate standing.

5350. Multimedia Development. 3. An introduction to techniques, software, and applications used in the design, manipulation, and development of multimedia artifacts for instructional purposes. This course includes accelerated, hands-on activities to practice and apply message design principles in multimedia settings. *Prerequisite:* graduate standing.

5470. Instructional Video. 3. An introductory course for teachers, media specialists, administrators, and others interested in planning, producing, and using instructional video. *Prerequisites:* graduate standing and consent of instructor.

5480. Short Course. 3. Used to provide offerings in special topics in instructional technology on the basis of need. *Prerequisites:* graduate standing and consent of instructor.

5510. Communication in Distance Education. 3. An introduction to the theory and practice of using communication tools for distance education purposes. Instructional issues related to the design, development, use, and evaluation of communication tools in public school, business, and other distance delivery settings are emphasized. *Prerequisite:* graduate standing.

5550. Theory of Change. 3. Explores the literature and research base within the theories, models, and processes of change, the diffusion of innovations, and the human side of educational reform. Learners explore practical applications of theoretical and research findings to behavioral change, diffusion of innovations, and principles and practices of planned change. *Prerequisite:* graduate standing.

5560. Design and Development of Instructional Systems. 3. Advanced study in instructional systems theory and design. Study and application of instructional design models used in education and training. *Prerequisite:* ITEC 5160, graduate standing, and consent of instructor. Previous course work in educational psychology/learning theory is desirable.

5660. Interactive Learning Systems. 1-3 (Max. 6). Covers all of the necessary elements to design and evaluate effective and efficient interactive learning systems. *Prerequisites:* ITEC 5160 or equivalent, graduate standing, and consent of instructor. Previous course work in educational psychology/learning theory is desirable.

5760. Instructional Design Applications. 3. Students engage in the application of principles of instructional design in a real-world setting. Students will be involved in classroom and field experience. *Prerequisite:* ITEC 5160 or 5560.

5870. Seminar. 1-3 (Max. 6). Advanced students in education work together, intensively, on current issues and problems relevant to instructional technology, and participate in systematic, critical interpersonal evaluations. *Prerequisites:* graduate standing and consent of instructor.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrollment in a graduate degree program.

5980. Dissertation Research. 1-12 (Max. 48). Designed for students who are involved in research for their dissertation project. Also used for student whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate degree program.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

Library Science (LIBS)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

2000. Libraries and Librarianship. 2. A study of the historical development of the library and its role as a social institution. Types of libraries and services, standards, current trends, professional training, and status and responsibility of the librarian are covered. It is beneficial to all who plan to do library work or who are working toward certification in library-media. (Offered based on sufficient demand and resources)

4360. Reference and Bibliography. 3. An introduction to the basic materials used in reference and information services. The philosophy of reference services is presented with particular attention to the needs of schools, community colleges and public libraries. *Prerequisite:* 20 hours of general education (liberal arts). (Offered based on sufficient demand and resources)

4380. Cataloging and Classification. 3. Introduction to the theories and practices of cataloging and classification. Emphasis is on the Dewey Decimal system; subject cataloging from the Sears headings; descriptive cataloging of monographs, serials, and non-print materials; filing rules. Practice in cataloging and classification of materials. Dual listed with LIBS 5380. *Prerequisite:* 20 hours of general education (liberal arts). (Offered based on sufficient demand and resources)

4520. Library Practice. 2-8 (Max. 8). Provides an overview of library organization, administration and service by capitalizing upon the utilization of practical experiences in dealing with everyday problems of the library. Application of principles learned in the various library courses will be stressed. Students must contact department the semester prior to enrollment for authorization to enroll in the course. This course serves as student teaching experience for students wishing to be endorsed in library science. *Prerequisite:* LIBS 4340.

5320. Selection of Instructional Materials. 3. A study of basic principles and practices in the selection of print and non-print materials for utilization in school and public libraries. Emphasis is given to the evaluation of materials in light of community needs and principles of intellectual freedom. Dual listed with LIBS 4320. *Prerequisite:* 20 hours of general education (liberal arts).

5380. Cataloging and Classification. 3. Introduction to the theories and practices of cataloging and classification. Emphasis is on

the Dewey Decimal system; subject cataloging from the Sears headings; descriptive cataloging of monographs, serials, and nonprint materials; filing rules. Practice in cataloging and classification of materials. Dual listed with LIBS 4380. *Prerequisite:* 20 hours of general education (liberal arts).

5440. Information Technology. 3. Provides information to help learners efficiently access information electronically. Philosophical, ethical, and management issues as well as technical information on the various mechanisms for electronic access now and in the near future are presented. The analysis of needs combined with knowledge of electronic tools for the purpose of efficiently meeting the information needs of clientele is stressed, as well as knowledge of the appropriate use of electronic products for more specific problems/projects. Cross listed with ADED 5440. *Prerequisite:* graduate standing and/or consent of instructor.

5520. Teaching the Use of the Library. 2. Methods for teaching students basic techniques for effective use of library media center resources. Integration of library media center instruction with the total instructional program is emphasized. Relationship between stages of cognitive and other development and appropriate learning activities. *Prerequisite:* LIBS 4320/5320 and LIBS 4380/5380.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* Advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes. *Prerequisite:* graduate standing.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrollment in a graduate degree program.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* Graduate standing.

Special Education

The special education programs are designed to prepare teachers to work with students with varied learning and behavior needs. Students may choose from one of two programs: a master of arts in education with an option in special education or a special education endorsement program leading to eligibility for K-12 special education generalist endorsement through the Wyoming Professional Teaching Standards Board. Additionally a Special Education Director Endorsement Program is available as well. Students who complete the coursework will receive a certificate in Special Education.

Program Specific Admission Requirements

For certificate applicants:

- Special Education application form
- Transcripts
- Three letters of recommendation
- Professional Writing Sample
- Current resume
- Copy of current Wyoming teaching certificate
- Signed Memo of Understanding
- International, non-native English speaking applicants: TOEFL scores of at least 80 for the online exam (with at least 20 on each subset) or 6.5 on the IELTS (minimum of 6 in each subset; scores must be within at least two years

In order to be considered for admission, all applicants must meet the following minimum requirements:

- Bachelor's degree from a regionally accredited institution with a minimum GPA of 3.000 on 4.000 scale

For master's applicants:

- Special Education application form
- Transcripts
- Three letters of recommendation
- Professional Writing Sample
- Current resume
- Copy of current teaching certificate
- Signed Memo of Understanding
- International, non-native English speaking applicants: TOEFL scores of at least 80 for the online exam (with at least 20 on each subset) or 6.5 on the IELTS (minimum of 6 in each subset; scores must be within at least two years

In order to be considered for admission, all applicants must meet the following minimum requirements:

- Bachelor's degree from a regionally accredited institution with a minimum GPA of 3.000 on 4.000 scale

Program Specific Degree Requirements

Students may choose to complete the program on a part-time or full-time basis. All Special Education courses are offered either online or through video-conferencing sites within Wyoming only. See descriptions under Special Education (EDEX).

Program Courses

EDEX	5100	.....3
EDEX	5071	.....3
EDEX	5080	.....3
EDEX	5355	.....3
EDEX	5720	.....3
EDEX	5200	.....3
EDEX	5110	.....3
EDEX	5120	.....3
EDEX	5150	.....3
EDEX	5870	.....2
EDEX	5870	.....2
EDEX	5000	.....3

K-12 Endorsement/Certificate Program

The special education endorsement program requires a total of 34 credit hours and does not require a culminating activity. Endorsement-only students are required to take a research class (see Master's Program).

Master's Program

The Master's degree program is a 34 credit-hour professional degree program that does not require a Plan A (thesis) or Plan B. The following coursework is required: EDEX 5071 Teaching Students with Mild/Moderate Disabilities; EDEX 5080 Teaching Students with Severe to Low Incidence Disabilities; EDEX 5720 Special Education Law; EDEX 5355 Assessment; EDEX 5100 Practicum II EDEX 5110 Positive Behavior Support and Management; EDEX 5120 Academic Instruction in General Education for Students with Disabilities; EDEX 5200 Practicum II; EDEX 5150 Research Applications in the Classroom or EDEX 5530 Introduction to Research or EDEX 5550 Action Research; EDEX 5000 Collaboration/Professional Interdisciplinary Relationships; EDEX 5250 Assistive Technology; and EDEX 5260 Transition Planning.

Applicants who hold a BA/BS degree and have a Wyoming teaching certificate, or have submitted an application for a Wyoming teaching certificate, are eligible to apply for admission to this graduate program. Applicants who do not have a Special Education background will need to take a Special Education foundation course prior to beginning the program coursework. On campus attendance is not required.

Special Education Director Endorsement Program

Students who successfully complete a Wyoming Principal's Certificate in Education Leadership and a Master's Degree or endorsement in Education (Special Education) can apply for endorsement as a Director of Special Education through Wyoming Professional Teaching Standards Board. The program is restricted to Wyoming students or students who have a contractual agreement with the University of Wyoming.

Students expecting to obtain this endorsement must complete both the Special Education Master's courses and also the Educational Leadership Certification courses.

Program Details for Director Endorsement

The endorsement program requirements are available by completing both the Special Education Master's program and the Educational Leadership Principal Certificate program. The program is offered through the UW Outreach School using distance education technology such as video conferencing, online, intensive weekends, or combinations of delivery methods. Upon completion of this program students are eligible to apply to the Wyoming Professional Teaching Standards Board for endorsement as a Director of Special Education.

Learner Outcomes

Upon completion of the Master of Arts or the K-12 Certificate program in Special Education, the candidates will demonstrate their knowledge and skills in:

1. **Learner Development/Individual Learning Differences.** Special education professionals understand how disabilities may interact with development and learning and use this knowledge to provide meaningful and challenging learning experiences for students with disabilities.

2. **Learning Environments.** Special education professionals create safe, inclusive, and culturally responsive learning environments so that students with disabilities become active and effective learners and develop emotional well-being, positive social interactions, and self-determination.
3. **Curricular Content Knowledge.** Special education professionals use knowledge of general and specialized curricula to individualize learning for students with disabilities.
4. **Assessment.** Special education professionals use multiple methods of assessment and data sources in making educational decisions.
5. **Instructional Planning and Strategies.** Special education professionals select, adapt, and use a repertoire of evidence-based instructional strategies to advance learning of students with disabilities.
6. **Professional Learning and Ethical Practice.** Special education professionals use foundational knowledge of the field and their professional ethical principles and practice standards to inform special education practice, to engage in lifelong learning, and to advance the profession.
7. **Collaboration.** Special education professionals collaborate with families, other educators, related service providers, students with disabilities, and personnel from community agencies in culturally responsive ways to address the needs of students with disabilities across a range of learning experiences.

Special Education (EDEX)

1000. Hot Topics in Special Education.

1. Academic, content-based course designed for first-year students, focuses on the critical thinking skills necessary to understand, analyze, and produce knowledge within the framework of educational inquiry. Serves as an introduction to the intellectual community of the university. Themes discussed focus on special education issues as they relate to ourselves, our schools, and our place in the community.

2000. Collaboration and Professional Relationships. 3. This course is designed to help students explore a range of collaboration and consultation strategies in the field of Special Education to enable them to successfully collaborate with a range of professionals, students, and families in a school setting. Course content

will prepare prospective special education teachers with conflict resolution skills, the ability to effectively facilitate meetings, and increase their inter and intra-personal skills.

Prerequisite: minimum 2.750 UW GPA.

2350. Prescriptive Teaching Practicum.

1-8 (Max. 8). Encompasses live, on-going, supervised practicum experience with regular students and students with special needs. Heavily emphasizes observation and direct instructional involvement with students with a range of special needs. *Prerequisites:* overall GPA 2.500 and consent of instructor.

2484. Introduction to Special Education.

3. Designed to meet the needs of education majors for a required course in special education. *Prerequisite:* EDST 2450 completed with a C or better and an institutional GPA of 2.500 or higher.

4720. Law and Students with Disabilities.

3. Provides prospective special education teachers with an overview of important case and statutory law in special education. Supports prospective special education teachers in analyzing disability laws and the ways in which these impact practice. *Prerequisites:* minimum 2.750 UW GPA and EDEX 2484 with a grade of C or better.

5000. Collaboration and Professional Interdisciplinary Relationships. 3. Represents an opportunity for students to examine and explore a range of consultant concepts in the field of Special Education. *Prerequisite:* Admission to the program or consent of instructor.

5071. Teaching Students with Mild and Moderate Disabilities. 3. Relates the theoretical, research, and practical aspects of mild-moderate disabilities to the student, teacher, classroom, parents, paraprofessionals, and other school personnel and community agencies, all in an effort to help understand and remediate student instructional and behavioral presenting problems. *Prerequisite:* Admission to program or consent of instructor.

5080. Teaching Students with Severe and Low Incidence Disabilities. 3. Designed to provide teachers with the repertoire of instructional, curricular, and behavior analytic skills needed to effectively serve students with severe and low-incidence disabilities. An emphasis on inclusive education and promoting access to the general curriculum will be stressed. *Prerequisites:* Admission to program or consent of instructor.

5100. Special Education Practicum I. 3. Designed to allow the student to practice skills and competencies reflected in the Council for Exceptional Children standards. The activities are designed to follow the Wyoming Teaching

Standards for Special Education Certification. *Prerequisite:* Admission to program or consent of the Instructor.

5110. Positive Behavior Support and Management. 3. Relates the theoretical, research, and practical strategies of behavior change models to students, teachers, parents, and paraprofessionals, in order to understand and remediate student behavior presenting problems, to include the application of systematic Behavior Management plans, BIPs, FBAs, BSPs, and school wide PBIS. *Prerequisites:* Admission to program or consent of instructor; EDEX 5071.

5120. Academic Instruction in General Education for Students with Disabilities.

3. Offers teachers appropriate practices and procedures for accommodating children with disabilities in their general education classroom. The focus is on moving from academic and nonacademic assessments to appropriate teaching and learning in the general education classroom environment. *Prerequisite:* Admission to program or consent of instructor.

5150. Research Applications in the Classroom.

3. Methodology for conducting applied research projects in classroom settings will be discussed. A variety of "classroom-friendly" experimental designs will be examined. In particular, the value of single-subject research in evaluating educational programs and serving as a rigorous, experimentally sound methodology are discussed. *Prerequisite:* Admission to program or consent of instructor.

5200. Special Education Practicum II. 3.

Designed to allow the student to practice skills and competencies reflected in the Council for Exceptional Children standards. The activities are designed to follow the Wyoming Teaching Standards for Special Education Certification. *Prerequisite:* Admission to program or consent of instructor; EDEX 5100.

5250. Assistive Technology and Transition.

2. Addresses assistive technology considerations for students with disabilities. Assessment, planning, selection, use, and evaluation of options will be emphasized. *Prerequisites:* Admission to program or consent of instructor.

5260. Transition Planning. 2. Examines the transition and post-high school options available for students with disabilities and in accordance with the requirements of the Individuals with Disabilities Education Act. Emphasis will be placed on assessment, planning, and evaluation of the transition components. *Prerequisite:* Admission to program or consent of instructor.

5355. Assessment. 3. Involves the history, ethics, data collection procedures, psychometric understanding, and interpretation of selected formal and informal psycho-educational tests; the relationship to a comprehensive evaluation and IDEA eligibility requirements; and the application of assessment results to the practical remediation of student instructional and behavioral presenting problems. *Prerequisite:* Admission to program or consent of instructor.

5680. Prescriptive Teaching Practicum. 1-8 (Max. 8). Graduate practicum/internship, the content of which involves supervised education experience in a special education classroom. *Prerequisites:* graduate status and consent of instructor.

5720. Special Education Law. 3. Provides prospective special education teachers and support personnel with overview of important case and statutory law in special education. *Prerequisites:* Admission to program or consent of instructor.

5730. Severe and Profound Handicaps. 3. Relates current research and practice to the systematic assessment, education and management of individuals who are severely and/or profoundly disabled. *Prerequisites:* 3 semester hours of graduate course work in special education, 3.000 graduate GPA, and consent of instructor and school director.

5870. Seminar. 1-6 (Max. 6). Represents an opportunity for students to examine and explore advanced concepts of prescriptive teaching. *Prerequisites:* consent of instructor and graduate standing.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

Professional Studies (PRST)

5070. Introduction to College Teaching. 3. This course is designed to provide students with an understanding of instructional theory and experiences in applying teaching and assessment methods relevant to the role of an educator in higher education. Linking theories, perspectives, and principles of effective teaching and learning to practice in higher education is a priority of the course. Practicing and experiencing “hands-on” activities will be prime formats of the class. *Prerequisite:* graduate standing.

5610. Introduction to Doctoral Studies. 3. Introduce incoming doctoral students to the fundamentals of doctoral study for the Ph.D. degree. Includes developing an understand-

ing of higher education, the organization and purposes of doctoral programs, and the exploration of the roles of teaching, research, and service at the university. *Prerequisite:* Admission to the program.

5880. Special Problems. 1-9. Provides a broad perspective through selected reading material. Wherever possible the student collects and used original information from a practical work situation. All work is done independently under the direction of a faculty member. A minimum of three conferences are held as necessary to assure successful completion of the project. *Prerequisites:* consent of instructor and school director, and graduate standing.

5890. Directed Professional Study. 1-9. Similar to PRST 5880. Provides additional opportunity for students to pursue advanced graduate work through independent research. Projects are done under the direction of a graduate faculty member. *Prerequisite:* graduate standing.

5900. Practicum in College Teaching. 1-3 (Max. 9). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

5920. Continuing Registration: On Campus. 1-2 (Max. 99). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 99). *Prerequisite:* advanced degree candidacy

5960. Thesis Research. 1-12 (Max. 99). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrolled in a graduate degree program.

5980. Dissertation Research. 1-12 (Max. 99). Graduate level course designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrolled in a graduate level degree program.

5990. Internship. 1-12 (Max. 99). *Prerequisite:* graduate standing.

College of Engineering and Applied Science

2085 Engineering Building

Cameron Wright, Interim Dean
Phone: (307)766-4253 FAX: (307)766-4444
Web site: ceas.uwyo.edu

Engineering is a profession that truly makes a difference. Engineers constantly discover how to improve lives by creating new solutions to real world problems and needs. From small villages to large cities, engineers are involved in innovative improvements to all aspects of life from health care, to energy production, to protecting and rehabilitating the environment, to developing the newest technological device. The broad background of communication, mathematical, scientific, and problem solving skills provided at the University of Wyoming will prepare engineering graduates to pursue careers in engineering, construction, environmental policy, even medicine or law. The possibilities are endless! The creativity and innovative thinking developed in engineering enables students to lead rewarding lives, work with inspiring people, and give back to their communities.

Computer science is a profession that is closely affiliated with engineering. At the University of Wyoming, degrees in computer science are awarded through the College of Engineering and Applied Science. The technology trends in this industry are also advancing at a tremendous rate. This requires that computer science education be at the forefront of new computing technologies, software languages, and networking.

Mission

The University of Wyoming's College of Engineering and Applied Science will provide excellent education, research, and service in chosen fields of engineering and applied science. The College emphasizes connectivity with society, life-long learning, and the essential problem-solving and collaborative skills needed to address the frontier challenges facing Wyoming, the nation and the world.

Design Experiences

In direct support of the goals of the individual departments within the College of Engineering and Applied Science, the design process is consistently developed and integrated throughout the curriculum from the freshman year through the senior year. Within the engineering science program, design elements such as basic analysis skills, communication

skills, experimental skills, computational skills, problem solving skills, and design methodology are taught. At the departmental level, these skills are developed further and the concepts of design methodology are reinforced. The design process culminates in a comprehensive design experience within the student's major.

Accreditation

The following undergraduate programs are accredited by the Engineering Accreditation Commission of ABET: architectural engineering, chemical engineering, civil engineering, computer engineering, electrical engineering, energy systems engineering, mechanical engineering, and petroleum engineering.

Various options within different engineering programs are accredited as part of the primary major. That is, the electrical engineering/bioengineering option is accredited as an electrical engineering degree, and the chemical engineering/petroleum option is accredited as a chemical engineering degree.

The Bachelor of Science in Computer Science is accredited by the Computer Accreditation Commission of ABET.

Programs of Study Undergraduate Degrees

Bachelor of Science in Architectural Engineering

Bachelor of Science in Chemical Engineering

Bachelor of Science in Chemical Engineering
(petroleum engineering option)

Bachelor of Science in Civil Engineering

Bachelor of Science in Computer Engineering

Bachelor of Science in Computer Science

Bachelor of Science in Computer Science
(business option)

Bachelor of Science in Construction Management

Bachelor of Science in Electrical Engineering

Bachelor of Science in Electrical Engineering
(Francis M. Long bioengineering option)

Bachelor of Science in Energy Systems Engineering

Bachelor of Science in Mechanical Engineering

Bachelor of Science in Petroleum Engineering

Graduate Degrees

Master of Science

Architectural engineering

Atmospheric science

Chemical engineering
Civil engineering
Civil engineering/water resources
Computer science
Computer science professional
Electrical engineering
Environmental engineering
Mechanical engineering
Petroleum engineering

Doctor of Philosophy

Atmospheric science
Chemical engineering
Civil engineering
Computer science
Electrical engineering
Mechanical engineering
Petroleum engineering

Candidates for the various master's degrees in engineering are required to do a full year's work in residence either under Plan A or Plan B.

Students should understand that a strong background in mathematics is necessary to actively pursue an engineering curriculum. Credit toward an engineering degree is not allowed for algebra and trigonometry.

Coursework in all four-year curricula stresses the mastery of subjects fundamental to all fields of engineering. The balance of the program is divided between cultural context and courses applying to the particular field selected. The aim is to provide the student with such groundwork that the general principles acquired may be used successfully in any one of the several specialized fields he or she may follow after graduation.

Depending on the major, a minimum of 120 to 132 semester hours of credit is required for the bachelor's degree from the College of Engineering and Applied Science. All course work must be selected with prior approval. Detailed outlines of curricula are presented later under headings of the various departments of the college. Since most engineering programs are similar during the first year, students may change an engineering major during this time with little or no loss in credit.

The electives in cultural context must be selected such that the student meets all university studies requirements not covered by specific courses in the detailed curriculum outlines.

Degree candidates must meet the academic requirements of the university and must have a grade point average of 2.000 (C) or above in all engineering courses attempted at this university.

Students may not take a course for S/U credit to satisfy any requirement for a degree from the College of Engineering and Applied Science, unless the course is offered for S/U credit only.

The College of Engineering and Applied Science adheres to prerequisite coursework being completed before moving forward to advanced coursework. If a student is found to be enrolled in a course without meeting the prerequisites, the student will be administratively dropped from the course.

All undergraduate engineering programs within the College of Engineering and Applied Science use the Fundamentals of Engineering Exam as one of their methods of outcomes assessment. As a graduation requirement, students must complete the exam, with a good faith effort, within one year prior to their expected graduation.

Preparation for the profession of engineering requires diligent work in the various curricula. The required credit hours can be completed in a four-year program, but because of the rigorous nature of some of the courses involved, some students may require additional time to complete degree requirements.

All engineering curricula are subject to minor program changes. The published curricula are general guides. Prospective students should consult the individual departments for current information.

International Engineering Minor

Students in the College of Engineering and Applied Science may earn a Minor in International Engineering. The Minor requires:

- a) a study abroad experience;
- b) 9 credits of lower-division coursework; and
- c) 9 credits of upper-division coursework.

More detailed requirements are available at: www.uwyo.edu/ceas/academics/intleng.html.

Graduate Study

The College of Engineering and Applied Science offers coursework and research opportunities leading to the following master's degrees: master of science in atmospheric science, chemical engineering, civil engineering, computer science, electrical engineering, environmental engineering, mechanical engineering, and petroleum engineering. Candidates for the various master's degrees in engineering are required to do a full year's study in residence either under Plan A or Plan B.

Only graduates with satisfactory GPAs in programs accredited by ABET are granted full admission to graduate study. In addition, graduates with satisfactory GPAs in undergraduate disciplines of meteorology, physics, mathematics, or related fields can be granted full admission to graduate studies in atmospheric science. Other engineering graduates can be admitted on a provisional basis.

The College of Engineering and Applied Science offers coursework and research opportunities leading to the following doctoral degrees: doctorate in atmospheric science, chemical engineering, civil engineering, computer science, electrical engineering, mechanical engineering, and petroleum engineering. Interdisciplinary programs of study and research leading to one of the above disciplinary degrees can be developed.

Engineering Science

Program Director: Steven F. Barrett,

Ph.D., P.E.

2076 Engineering Building,

(307) 766-6181

FAX: (307) 766-4444

Engineering Science offerings present the fundamental engineering concepts upon which most engineering analysis and design work is based. Faculty are drawn from all of the academic departments in the college. These core courses represent the majority of engineering offerings at the freshman and sophomore level.

Courses in engineering science have their roots in mathematics and physical science, extending knowledge toward creative application. Thus, students must take their courses in calculus, chemistry, physics, and engineering science in a timely manner. Details are given in the published curriculum for each program. **A grade of C or better must be earned in all courses that are prerequisite to any required engineering science course.**

Engineering Science (ES)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

1000. Orientation to Engineering Study.

1. [I,L♦(none)] Skills and professional development related to engineering. Involves problem solving, critical thinking and ethics, as well as activities to help transition to university environment. Required of all freshmen entering engineering curricula. Students with credit in UNST 1000 may not receive credit for this course.

1002. Introduction to Engineering Information Literacy. 0.5. [L♦(none)] Offers transfer students the opportunity to satisfy the College of Engineering and Applied Science requirements for the Information Literacy and the initial O component of the University Studies Program.

1060. Introduction to Engineering Problem Solving. 3. An overview of the methodology and tools used in the engineering profession for analyzing problems. Example problems are solved using spreadsheet tools and structured programming language. Laboratory. *Prerequisite:* MATH 2200 or concurrent enrollment.

1061. Engineering Problem Solving with Spreadsheets. 1. An introduction to engineering problem solving through the use of computer spreadsheets. Topics include functions, referencing, conditional statements, graphs, trendlines, and iterative solvers. *Prerequisite:* MATH 1400 or MATH 1450 or ACT Math Score of 25 or Math Placement Exam score of 4.

1062. Introduction to Structured Programming. 1. Introduction to structured programming through the use of computer applications. Topics include built-in functions, user functions, logical operators, flowcharts, pseudo code, selection structures, repetition structures, and plotting. *Prerequisite:* ES 1061.

1063. Graphical Communication and Solid Modeling. 1. An introduction to solid models and graphical communication. Topics include geometric relationships, solid parts, solid assemblies, constraints, orthogonal projection, multiview representation, dimensioning, and drawing annotation. *Prerequisite:* MATH 1400 or MATH 1450 or ACT Math Score of 25 or Math Placement Exam score of 4.

1101. First-Year Seminar. 3. [(none)♦FYS]

2110. Statics. 3. Vector statics of particles and rigid bodies, including equilibrium in two and three dimensions, center of gravity, centroids, distributed loads, truss analysis,

simple structures and machines, friction, and internal actions. *Prerequisites:* MATH 2205 or concurrent enrollment.

2120. Dynamics. 3. Vector dynamics of particles and rigid bodies, including impulse-momentum and work-energy. *Prerequisites:* ES 2110 and MATH 2205; PHYS 1210 or concurrent enrollment.

2210. Electric Circuit Analysis. 3. Basic concepts of electric circuit theory, dependent sources, network theorems, first and second order circuits, phasors, three-phase circuits. Laboratory. *Prerequisite:* MATH 2205 or concurrent enrollment.

2215. Electric Circuit Analysis Lecture. 2. Basic concepts of electric circuit theory, dependent sources, network theorems, first and second order circuits, phasors, three-phase circuits. No laboratory. Available for Outreach students only. *Prerequisite:* MATH 2205.

2216. Electric Circuit Analysis Laboratory. 1. Laboratory activities focusing on basic concepts of electric circuit theory, dependent sources, network theorems, first and second order circuits, phasors, three-phase circuits. *Prerequisite:* ES 2215.

2310. Thermodynamics I. 3. Macroscopic systems involving energy and its various forms. Fundamental concepts including energy, mass and entropy balances. Pure substances and availability. Reversible and irreversible processes. *Prerequisites:* MATH 2210 and either ES 2120 or PHYS 1210.

2330. Fluid Dynamics. 3. Incompressible flow of ideal and real fluids. Potential and stream functions; similitude and dimensional analysis. *Prerequisites:* MATH 2210 and either ES 2120 or PHYS 1210.

2410. Mechanics of Materials. 3. Mechanics of deformable bodies, including energy methods. *Prerequisite:* ES 2110 and MATH 2205.

3001. International Systems Engineering. 3. This 4-week service learning course will offer students hands-on experience in fabricating, assembling and installing a system as part of a team. Students will learn about materials, welding, electrical systems, and aerodynamics, all the while experiencing international life and cultures. *Prerequisite:* MATH 2310.

3010. Culture and Engineering in Latin America. 3. [(none)◀▶H] Engineering and Culture of Latin America - A study of ancient engineering problems in Latin America that are applicable to civil engineering. Students will be exposed to cultural aspects that influenced Mayan infrastructure. *Prerequisite:* ES 2110 or PHYS 1210.

3020. Comparison of Entrepreneurial Ecosystems. 3. The goal of this course is to expose students to different entrepreneurial ecosystems and let them think about how the environment, legal, technical, cultural, and economic, could impact their entrepreneurial endeavors. The class will accomplish this by visiting a developed country (e.g. Spain) and a developing country (e.g. Morocco) to learn about the ecosystems and talk with entrepreneurs to see how the forces impacted their startups. Cross listed with ENTR 3020.

3100. Internship Prepared. 1. The purpose of this Internship Preparation course is to prepare students for applying to internships in all applicable facets. Students will learn how to build their resume, write job specific cover letters, search for positions, and communicate with employers effectively. This course is a self-study with assignments given weekly. Students will be required to complete assignments and schedule individual appointments with an instructor in order to follow up on assignments. *Prerequisite:* 6 credits within your discipline.

3890. Engineering Honors Program Research Methods. 3. A general approach to scientific research and graduate school preparation. Topics will include: finding a research mentor, literature search skills, using the scientific method for approaching a research problem and developing a research methodology, writing a research funding proposal, delivering a research presentation and selecting and applying for graduate school. Restricted to College of Engineering Honors Program students. Cross listed with ARE/ATSC/CE/CHE/COSC/EE/PETE 3890. *Prerequisite:* sophomore standing.

4580. Honors Undergraduate Research. 3. An independent research experience for undergraduate students enrolled in the Engineering Honors Program. Before registering for this class, students are responsible for discussing their interests with faculty, identifying a willing research mentor, obtaining approval by said mentor, and communicating the student/faculty partnership to the appropriate staff in their home department. Must be in the Engineering Honors Program. Cross listed with ATSC/BE/CE/CHE/COSC/ESE/PETE 4580. *Prerequisite:* junior or senior standing.

4910. Survey of Engineering Management. 3. Offers a survey of a variety of topics related to engineering management. The objective is to introduce students to some of the non-technical aspects of engineering practice and management. *Prerequisite:* junior standing in an engineering degree program.

4920. Entrepreneurship for Engineers. 3. Traditional engineering education does not prepare graduates for work in entrepreneurial ventures. The goal of this course is to have students demonstrate skills in developing business ideas, performing preliminary market research, estimating cash flow, and launching a business. *Prerequisites:* 9 hours within an engineering discipline and junior standing.

4970. Engineering CO-OP. 1 (Max. 6). Provides a mechanism for students on engineering co-op to maintain continuous registration and have the co-op experience reflected on their transcript. Credit earned will not normally count toward graduation credit. Offered S/U only. *Prerequisite:* must be involved in an engineering co-op experience.

5600. Research Data Management. 3. A general approach to research data management for graduate students and researchers. Topics include: the case for data management, data management planning, meeting grant requirements, formatting and organizing, storing and transferring, legal and ethical issues, strategies for research teams, sharing data, and publishing, citing, and rights to research data. Cross listed with GRAD/LBRY 5600. *Prerequisite:* graduate standing.

Department of Atmospheric Science

6034 Engineering Building,
(307) 766-3245

FAX: (307)766-2635

Web site: www.atmos.uwyo.edu

Department Head: Bart Geerts

Professors:

BART GEERTS, Licentiaat Physical Geography Katholieke University, Belgium 1984; Engineer in Irrigation Sciences 1986; Ph.D. University of Washington 1992; Professor of Atmospheric Science 2011, 1999.

JEFFERSON R. SNIDER, B.S. University of Oregon 1979; M.S. University of Arizona 1982; Ph.D. University of Wyoming 1989; Professor of Atmospheric Science 2004, 1990.

Associate Professor:

SHANE MURPHY, B.S. University of Colorado 2000; Ph.D. California Institute of Technology 2009; Associate Professor of Atmospheric Science 2019, 2011.

Assistant Professors:

DANA CAULTON, B.S. Indiana University 2010; Ph.D. Purdue University 2014; Assistant Professor of Atmospheric Science 2018.

JEFFREY R. FRENCH, B.S. South Dakota School of Mines 1992; M.S. 1994; Ph.D. University of Wyoming 1998; Assistant Professor of Atmospheric Science 2015.

ZACHARY J. LEBO, B.S. Pennsylvania State University 2007; M.S. 2009; Ph.D. California Institute of Technology 2012; Assistant Professor of Atmospheric Science 2015.

Adjunct Professors:

Xiaohong Liu
Zhien Wang

Professors Emeritus:

Terry L. Deshler, Robert D. Kelly, John D. Marwitz, Derek C. Montague, Thomas R. Parish, Alfred R. Rodi, Gabor Vali

Atmospheric Science is a rapidly developing discipline in which meteorology, physics, chemistry, biology, engineering, mathematics and computer science are all being applied in an effort to better understand the earth's atmosphere. The entire development of atmospheric science demonstrates how progress can result from the application of knowledge developed in the basic sciences to a complex environmental system. Concurrently, atmospheric scientists develop many observational and analytical techniques unique to the study of the atmosphere. Over the past decades, atmospheric science developed vigorously, stimulated by the availability of the latest satellite, ground-based and aircraft observations, as well as the availability of large computers for numerical simulations of atmospheric processes. At the same time, the importance of the atmosphere as a crucial resource in the welfare and survival of humankind is being recognized, as knowledge about how the atmosphere behaves is obtained.

The Department of Atmospheric Science offers graduate programs leading to the M.S. and Ph.D. degrees.

In these graduate programs, great emphasis is placed on the active research involvement of students both during the academic year and during the summer months. The low student to faculty ratio in the department ensures an atmosphere of vital cooperation among students, faculty and staff. Student theses form integral parts of the department's research productivity and almost always lead to publishable results.

Research interests in the department center around cloud and precipitation physics, cloud and mesoscale atmospheric dynamics, boundary layer processes, tropospheric and stratospheric aerosols and chemistry, ozone depletion, wind energy, global change, instrumentation and air quality. These interests are

also reflected in the department's academic program, which has the breadth and depth necessary to give students a background for entering into many different types of employment upon graduation.

A number of unique research tools are available in the department. Prominent among these is the King Air research aircraft which carries extensive instrumentation and computer-directed data acquisition systems. The tropospheric and stratospheric balloon launch facility is used to sample aerosols, volcanic plumes, clouds and ozone in Laramie, and in both the north and south polar regions. Excellent laboratory facilities are available in the department's spacious quarters. These laboratories focus on aerosol and ice nucleation research, on atmospheric optics, remote sensing, and atmospheric chemistry. Well-equipped electronic and mechanical construction and design facilities are conducive for work in instrumentation development. A wide range of computer facilities are available, providing excellent support both in hardware and software for research activities and for learning. The Department of Atmospheric Science is the lead user of the Wyoming allocation of the NCAR Wyoming Supercomputer Center.

A prerequisite for admission to the graduate program is a bachelor's degree in meteorology, engineering, physics, chemistry, mathematics or a similar relevant discipline. Graduate assistantships are available by application to the department and are awarded on the basis of past record and promise for achievement.

For material containing further details on curriculum and research programs, write to the graduate admissions coordinator or visit the web site at www.uwyo.edu/atsc/.

Graduate Study

The Department of Atmospheric Science offers degree programs leading to the master of science and doctor of philosophy degrees.

The department has strong research programs in the following areas: cloud physics and dynamics; tropospheric aerosols and clouds; greenhouse gases; air pollution and wildfires; boundary layer processes; remote sensing; and airborne instrumentation. The department's observational facilities are: 1) the King Air research aircraft (UWKA); 2) the Wyoming Balloon Launch Facility; 3) the Air Quality Mobile Lab and the Wyoming Air Quality Monitoring Lab; 4) the Wyoming Cloud Radar (WCR) and Wyoming Cloud Lidar (WCL) for the study of

cloud structure and composition; and 5) the Keck Aerosol Laboratory. The UWKA, WCR, and WCL are designated Lower Atmospheric Observing Facilities by the National Science Foundation (NSF).

Please refer to the departmental homepage at www.atmos.uwyo.edu for programmatic updates, or contact the department directly.

Program Specific Admission Requirements

Admission based on the university minimum requirements. Admissions are competitive.

Program Specific Graduate Assistantships

Assistantships are offered for both the M.S. and Ph.D. tracks.

Program Specific Degree Requirements

Master's Program Plan A

Approval of research plan by the graduate committee

Colloquium and oral defense of M.S. thesis

Approval of M.S. thesis by the graduate committee

Requires a minimum of 26 hours of acceptable graduate coursework and four hours of thesis research and a thesis (final written project).

21 in-residence coursework hours

Master's Program Plan B (non-thesis)

30 hours of acceptable graduate coursework and a Plan B Paper that summarizes internship/research experience

Doctoral Program

Qualifying assessment exam

Approval of research plan by the graduate committee

At least one colloquium presentation per year

Preliminary exam

Oral defense of Ph.D. dissertation

Approval of Ph.D. dissertation by the graduate committee

Ph.D. requires a minimum of 72 graduate hours, with at least 42 hours in formal coursework. This includes appropriate coursework from a master's degree.

Additional credits toward the 72 credit hour requirement may include dissertation research hours, internship hours, or additional coursework.

24 in-residence coursework hours

Required Courses

These courses are required for the master's program.

ATSC 5010: Physical Meteorology. 4.

ATSC 5011: Physical Meteorology II. 4.

ATSC 5014: Dynamic Meteorology. 4.

ATSC 5016: Synoptic and Mesoscale Meteorology. 4.

ATSC 5018: Ethics & Research Methods. 1.

UW Elective(s) to be determined by committee. 9 minimum

Atmospheric Science (ATSC)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦PN]).

1101. First-Year Seminar. 3. [(none)♦FYS]

2000. Introduction to Meteorology. 4. [SE♦PN]

First course in meteorology for students with minimal background in math and science. Provides general and practical understanding of weather phenomena. Emphasizes observational aspects of the science, meteorological view of the physical world and the impact the science has on life and society. Includes three hours of lecture and one laboratory per week. Includes atmospheric composition and structure, radiation, winds and horizontal forces, stability and vertical motions, general circulation, synoptic meteorology, clouds and precipitation, severe storms and atmospheric optics.

2100. Global Warming: The Science of Humankind's Energy Consumption Impacting Climate. 3. [(none)♦PN]

Introduces non-specialists to the fundamental scientific principles governing climate change. The underlying physics of both human and natural contributions to global warming is presented along with uncertainties in predicting climate. Potential strategies to mitigate global warming (alternative energy, carbon capture, and geoengineering) are also discussed.

2200. Severe and Unusual Weather. 3. [(none)♦PN]

A nontechnical course on severe and unusual weather events that occur around the globe. The focus of the course is on a wide range of weather events that have profound impacts on societies, economics, and cultures, and the material is presented in a qualitative manner such that is highly accessible by students coming from all backgrounds.

3890. Engineering Honors Program Research Methods. 3.

A general approach to scientific research and graduate school preparation. Topics will include: finding a research mentor, literature search skills, using the scientific method for approaching a

research problem and developing a research methodology, writing a research funding proposal, delivering a research presentation and selecting and applying for graduate school. Restricted to College of Engineering Honors Program students. Cross listed with ARE/CE/CHE/COSC/EE/ES/PETE 3890. *Prerequisite:* sophomore standing.

4010. Atmospheric Processes I. 3. Tools for understanding of physical processes occurring in the atmosphere are presented and integrated. Emphasis on ideal gas equation (for mixture), parcel concept, hydrostatics, mass conservation modeling, first law thermodynamics and radiation in the cloud-free atmosphere. Rudiments needed for problem solving are emphasized - integral and differential forms and dimensional analysis. *Prerequisites:* PHYS 1320 and either MATH 2210 or MATH 2310.

4320. The Ocean Environment. 3. Focuses on the ocean as a system. Objective is the development of interdisciplinary understanding of marine processes, especially those processes occurring along coastal margins. Emphasis is on the development of quantitative models and their use in understanding anthropogenic impact on ocean resources. Dual listed with ATSC 5320. *Prerequisites:* MATH 2310, PHYS 1310, CHEM 1030, ES 3060 (or ES 3070), LIFE 1010, senior standing or higher.

4580. Honors Undergraduate Research. 3.

An independent research experience for undergraduate students enrolled in the Engineering Honors Program. Before registering for this class, students are responsible for discussing their interests with faculty, identifying a willing research mentor, obtaining approval by said mentor, and communicating the student/faculty partnership to the appropriate staff in their home department. Must be in the Engineering Honors Program. Cross listed with BE/CE/CHE/COSC/ES/ESE/PETE 4580. *Prerequisite:* junior or senior standing.

4650. Undergraduate Research in Atmospheric Science. 2-6 (max 9).

Course Description and *Prerequisites:* Independent research in atmospheric science under supervision of an atmospheric science faculty member. Projects are possible in the fields of cloud and aerosol physics, radar meteorology, mesoscale dynamics, and stratospheric chemistry. Participation in field work, involving the UW aviation or stratospheric ballooning facilities, is a possibility. Research results are summarized in a report. *Prerequisites:* ATSC 4000 and 4100, plus consent from advising faculty.

4900. Problems in Atmospheric Science. 1-3 (Max. 10).

Independent study of a particular problem or phrase of atmospheric science, or presentation of reviews and discussion

of current advances in atmospheric science investigations. *Prerequisites:* ATSC 4010, 4031, and 4035.

5008. Mesoscale Meteorology. 3. Fundamental dynamics of mesoscale motions including departures from hydrostatic balance. Mesoscale energy sources. Boundary layer circulations. Convective initiation. Structure and dynamics of deep convection and mesoscale organized convection. Atmospheric waves. Thermally and dynamically forced flow over mountains. *Prerequisite:* permission of the instructor.

5010. Physical Meteorology I. 4. First and second law of thermodynamics applied to energy transformations in the atmosphere, including dry, moist, and saturated processes and atmospheric stability. Fundamentals of radiation including blackbody, planetary budget, and propagation and how these drive the thermodynamics of the earth's atmosphere. *Prerequisites:* MATH 2210, PHYS 1310 and PHYS 1320 or equivalent.

5011. Physical Meteorology II. 4. Quantitative description of cloud particle nucleation, growth by condensation, and growth by deposition and collection. Ties to other atmospheric processes, e.g., radiation budgets and cloud dynamics, are also emphasized. Course material is presented in lecture and computer-based laboratory settings. A numerical cloud model is developed and analyzed in the laboratory. *Prerequisite:* ATSC 5010.

5014. Dynamic Meteorology. 4. Development and interpretation of the atmospheric equations of motion, scales of motion, horizontal atmospheric winds, thermal wind equation, circulation and vorticity, mesoscale motions. Introduction to planetary boundary layer flows. Data visualization software is also introduced and used to develop understanding of dynamical processes. *Prerequisites:* MATH 2210, PHYS 1310 and PHYS 1320 or equivalent.

5016. Synoptic Meteorology. 4. Large-scale vertical motion as viewed from quasigeostrophic and isentropic potential vorticity perspectives. Baroclinic instability, and the structure and evolution of extratropical cyclones. Identification and development of fronts, jet streams and associated weather features. Role of topography on large-scale circulations. *Prerequisites:* MATH 2210, PHYS 1310 and PHYS 1320 or equivalent.

5018. Ethics and Research Methods. 1. Ethics and ethical dilemmas in research and academia and how to address them are discussed. This course also covers general research methodology and describes processes

for research funding and disseminating research findings and the peer-review process.

Prerequisite: graduate standing.

5040. Climate Science and Climate Change.

3. Global climate system components, and their interactions. Radiative, dynamic, thermodynamic, chemical, and feedback processes affecting the climate system. Natural and anthropogenic drivers of climate change. Past and present climate variability and sensitivity, and its simulation. Structure of climate models, their components, parameterizations, and attributes. Current climate modeling results and predictions of future climate. *Prerequisites:* ATSC 5001, ATSC 5016.

5210. Cloud and Precipitation Systems. 3.

Types of clouds and precipitation systems, and the precipitation mechanisms in those systems; structure of convective, orographic, and frontal systems and severe storms. Schematic and numerical models of clouds and storms with emphasis on hailstorms. *Prerequisite:* ATSC 5011 and ATSC 5014.

5310. Atmospheric Dynamics II. 3. Introduction to the dynamic energetics of the atmosphere, wave motions, atmospheric instabilities. Introduction to numerical modeling, applications. *Prerequisite:* ATSC 5014.

5320. The Ocean Environment. 3. Focuses on the ocean as a system. Objective is the development of interdisciplinary understanding of marine processes, especially those processes occurring along coastal margins. Emphasis is on the development of quantitative models and their use in understanding anthropogenic impact on ocean resources. Dual listed with ATSC 4320. *Prerequisite:* MATH 2310, PHYS 1310, CHEM 1030, ES 3060 (or ES 3070), LIFE 1010, senior standing or higher.

5330. Boundary Layer Meteorology. 3. A quantitative and descriptive study of the thermodynamics and dynamics of the planetary boundary layer, including budgets (heat, moisture, momentum, turbulent kinetic energy, radiation), stability, turbulence and turbulent fluxes, convection, terrain effects, phenomenology, and measurement and analysis techniques. *Prerequisite:* ATSC 5010, ATSC 5014.

5340. Radar Meteorology. 3. The theory of radar and the application of radars to studies of the atmosphere, including basic radar design, distributed targets, attenuation, polarization, Doppler velocities, analysis techniques, and examples of radar studies of clear air, clouds, and precipitation. *Prerequisite:* ATSC 5010, ATSC 5011.

5350. Atmospheric Chemistry. 3. Origin and composition of the atmosphere. Sources, lifetimes, transport of gases and aerosols. Cycles of C, S, N and trace elements. Removal

processes: precipitation, and dry deposition. Homogenous and Heterogeneous kinetics. Anthropogenic influences: effect of air pollution on radiation balance and cloud processes. *Prerequisite:* graduate standing in a physical science or engineering.

5360. Aircraft Instrumentation. 3. An introduction to instrumentation used on research aircraft to measure properties of the atmosphere. Topics include measuring atmospheric state, atmospheric particles, and other constituents (i.e. trace gases) from aircraft. Principles of measurement techniques are described, complexities due to clouds are presented, and resulting uncertainties and limitations are explored. *Prerequisite:* Graduate student in Atmospheric Science or consent of instructor.

5370. Satellite Remote Sensing. 3. Physical principles of atmospheric remote sensing, with a breadth of applications in passive and active remote sensing of the atmosphere. Offers a solid understanding of remote sensing instrumentation and retrieval approaches for a variety of atmospheric parameters. *Prerequisite:* graduate student in Atmospheric Science or consent of instructor.

5600. Advanced Cloud Microphysics. 3. Analysis of the processes involved in cloud and precipitation formation. Detailed treatments of the condensation, ice nucleation, vapor growth, and collection processes. Emphasis is on reviewing the current state of knowledge in the field and on surveying directions of research. *Prerequisite:* ATSC 5010 and ATSC 5011.

5700. Numerical Modeling of Atmosphere. 3. Governing equations and assumptions, finite differencing, subgrid-scale processes, cloud processes, aerosol and atmospheric chemistry, boundary layer processes, radiative transfer, cumulus parameterizations, parcel models, kinematic models, large-eddy simulating (LES) models, cloud-resolving models (CRMs), large-scale regional and global climate models (GCMs). *Prerequisite:* ATSC 5010 or ATSC 5011 or ATSC 5014 or consent of instructor.

5880. Atmospheric Science Problems. 1-3 (Max. 6). A special course for graduate students in atmospheric science only, designed to make possible the study and investigation of problems or phases of atmospheric science selected to fit the needs of students.

5890. Atmospheric Science Seminar. 1-3 (Max. 6). A seminar-type class furnishing motivation for advanced study of current problems by means of library research, study of current literature, and carefully guided class discussions. *Prerequisite:* consent of department head.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

5920. Continuing Registration: On Campus. 1-12 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12. (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrolled in a graduate degree program.

5980. Dissertation Research. 1-12 (Max. 48). Graduate level course designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrolled in a graduate level degree program.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

Department of Chemical Engineering

4055 Engineering Building,
(307) 766-2500

Web site: www.uwyo.edu/chemical

Department Head: Vladimir Alvarado

Professors:

VLADIMIR ALVARADO, B.Sc. Universidad Central de Venezuela 1987; M.S. Institut Francais du Pétrole 2002; Ph.D. University of Minnesota 1996; Professor of Chemical Engineering 2017, 2006.

DAVID M. BAGLEY, B.S. Colorado School of Mines 1984; M.S. Cornell University 1989; Ph.D. 1993; Professor of Chemical Engineering 2011, 2005.

DAVID A. BELL, B.S. University of Washington 1976; M.S. Rice University 1979; Ph.D. Colorado State University 1992; Professor of Chemical Engineering 2019, 1993.

JOSEPH HOLLES, B.S. Iowa State University 1990; M.E. University of Virginia 1998; Ph.D. 2000; Associate Professor of Chemical Engineering 2010.

JOHN OAKEY, B.S. The Pennsylvania State University 1997; M.S. Colorado School of Mines 1999; Ph.D. 2003; Professor of Chemical Engineering 2019, 2010.

MICHAEL V. PISHKO, B.S. University of Missouri-Columbia 1986; M.S. 1987; Ph.D. University of Texas at Austin 1992; Professor of Chemical Engineering 2015.

Associate Professors:

SAMAN ARYANA, B.S. University of Texas at Arlington 2003; M.S. 2006; Ph.D. Stanford University 2012; Assistant Professor of Chemical Engineering 2013.

KATIE DONGMEI LI-OAKEY, B.S. Shandong University of Technology 1994; M.S. Tianjin University 1997; M.S. University of Colorado at Boulder 1999; Ph.D. 2003; Associate Professor of Chemical Engineering 2018, 2011.

PATRICK JOHNSON, B.S. Lehigh University 1992; M.S. University of Virginia 1994; Ph.D. Columbia University 2004; Associate Professor of Chemical Engineering 2012, 2006.

Assistant Professors:

KAREN WAWROUSEK, B.S. The College of St. Rose 2001; Ph.D. California Institute of Technology 2009; Assistant Professor of Chemical Engineering 2014.

Adjunct Professors:

John Ackerman
Morris Argyle
Youqing Shen
John Schabron

Professors Emeriti:

Chang Yul Cha
H. Gordon Harris
Henry W. Haynes

Chemical Engineering is one of the most versatile of the engineering programs. It prepares students for employment in many diverse fields, such as production of pharmaceuticals, polymers and plastics, semiconductors, heavy industrial chemicals, synthetic fuels, petrochemicals and petroleum refining. Chemical engineers also work in biological engineering, environmental engineering, enhanced oil recovery, corrosion control, metallurgy and microelectronics. Undergraduate chemical engineering training has been found to be an excellent background for graduate work not only in engineering, but also in a number of other fields, including medicine, law, business, and the natural sciences.

The chemical engineering curriculum is based on a sound background in chemistry, mathematics, physics, and biology. The essentials of engineering are added to this foundation, including fluid dynamics and thermodynamics. In order to develop the individual's social consciousness and to broaden the student's educational background, an integrated program of study in the humanities and social sciences is included in the curriculum. Chemical engineering courses in multicomponent thermodynamics, transport phenomena, kinetics, process control and process design are concentrated in the junior and senior years. This program provides training for engineers to enter production, research, product and process development, process design, technical sales and engineering management positions. Training in chemical engineering equips the graduate to solve many of the problems facing society today: human health, energy shortages, synthetic fuels production, water and air pollution, toxic chemical control, and food production. Furthermore, our program prepares students interested in a career in medicine or the life sciences and is suitable for pre-medical and pre-dental students.

The department offers an 18-credit-hour block of approved technical electives. Students select an emphasis in Biological Engineering, Environmental Engineering, Materials Science and Engineering, Chemical Process Industry, Petroleum Engineering, Graduate School Preparation, and Pre-Medicine. Students can also pursue a concurrent major in Chemistry, minors in Physics, Chemistry, Math, Computer Science, Molecular Biology and Business. See department for details. Students are required to take a minimum of 3 credits of Chemical Engineering Technical electives. The Chemical Engineering Program requires that the number of credits of upper division courses be satisfied (ie., 10 credits of Technical electives must be 3000+). The Chemical Engineering program requires 48 hours of 3000 and 4000-level coursework. This is fulfilled by required courses and approved technical electives.

Chemical Engineering degree candidates must meet the academic requirements of the college and, in addition, must have a GPA of 2.000 in Chemical Engineering courses attempted at UW that are applied toward graduation for the B.S. degree from the department. Students must achieve a C- or better in all chemical engineering courses serving as a prerequisite for another chemical engineering course.

Chemical Engineering Program Educational Objectives

Three to six years after graduation, graduates who choose to practice in Chemical Engineering should:

- Successfully practice the profession of Chemical Engineering;
- Demonstrate successful career growth

Chemical Engineering Program Outcomes

During the course of study in Chemical Engineering, the student should demonstrate:

- an ability to apply knowledge of mathematics, science, and engineering;
- an ability to design and conduct experiments, as well as to analyze and interpret data;
- an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
- an ability to function on multidisciplinary teams;
- an ability to identify, formulate, and solve engineering problems;
- an understanding of professional and ethical responsibility;
- an ability to communicate effectively;
- the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
- a recognition of the need for, and ability to engage in life-long learning;
- a knowledge of contemporary issues;
- an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Chemical Engineering Curriculum

For students entering UW Fall 2018 or later.

CHE	1005.....	1
CHEM	1060.....	3
CHE	2005.....	3
CHE	2060.....	3
CHE	2070.....	3
CHE	2080.....	3
CHE	3015.....	3
CHE	3026.....	3
CHE	3028.....	3

CHE 3040.....	3
CHE 3070.....	3
CHE 4050.....	3
CHE 4060.....	3
CHE 4070.....	4
CHE 4080.....	4
CHE 4090.....	3
CHEM 1050.....	4
CHEM 2420.....	4
CHEM 2440.....	4
CHEM 4507.....	3
LIFE 1010.....	4
MATH 2200.....	4
MATH 2205.....	4
MATH 2210.....	4
MATH 2310.....	3
PHYS 1210.....	4
PHYS 1220.....	4

Approved Electives

See CEAS Advising Center for a current list of approved technical electives

Transfer Coursework: All Wyoming Community College equivalent courses will be evaluated for acceptance into the CHE program. For upper-division coursework, no more than two CHE 3000+ courses can be transferred and applied to the CHE degree, however, CHE 4070 Process Design I and CHE 4080 Process Design II cannot be transferred to UW.

In addition, all CHE transfer courses must be completed with a grade of C- or better.

The upper-division rules may be waived for classes taken during Study Abroad and National Student Exchange Programs with pre-approval.

Minor in Process Control and Instrumentation

The goal of the Process Control and Instrumentation Minor is to provide students obtaining Bachelor of Science majors in the College of Engineering and Applied Science at the University of Wyoming with enhanced education to better meet industry's needs. This minor will be particularly useful for students majoring in Chemical Engineering, Electrical Engineering, Mechanical Engineering, and Petroleum Engineering.

Minor Requirements

The Minor in Process Control and Instrumentation will require a minimum of 18 hours of coursework. No more than 6 hours of coursework taken for the minor may also count as required (non-elective) coursework toward a student's major.

Required Courses	Hrs.
CHE 2005.....	3
CHE 2090.....	2
CHE 3090.....	1
CHE 4092.....	3

One of CHE 4090, EE 4620, or EE 4621....3

Approved Elective Courses: At least 6 hours of the following: EE 2210, EE 3220, ME 4020, COSC 4450, COSC 4765, or CHE 4972.....6

Minor Total Hours 18

BS/MS CHE Quick Start Program

The BS/MS Quick Start program in Chemical Engineering (CHE) is designed to present highly qualified UW students with the opportunity to begin graduate study while they complete their Bachelor of Science (B.S.) degree in Chemical Engineering. These students may apply for admission to the Quick Start program during the second semester of their junior year or during their senior year.

This program allows for early planning of the graduate portion of a student's education and provides more flexibility in the number of required courses and the order in which they are taken. The more efficient and better-planned use of time should result in reduction of the time required for obtaining the Master of Science in Chemical Engineering (M.S. CHE) degree. Students who enter the Quick Start program must accept the primary responsibility for actively planning their programs of study to assure timely completion of their coursework and research programs.

The Quick Start program contains two essential elements:

Qualified students may receive provisional admission to the Chemical Engineering graduate program prior to completing the normal application process. This provisional admission will permit students to make their long-term educational plans earlier in their studies, thus providing enhanced opportunities for course selection and involvement in research.

Students in the program may apply up to 6 credit hours of 5000-level courses toward both the B.S. and M.S. degree programs. By completing successfully up to 6 credit hours of

graduate classes during their senior year, these students will have demonstrated their ability to do graduate-level coursework as undergraduates, easing their transition to the Chemical Engineering graduate program.

For additional information and an application form, please contact the CHE graduate program coordinator at (307) 766-2500 or stop by 4055 Engineering Building.

Graduate Study

The Department of Chemical Engineering offers graduate programs leading to the M.S. and Ph.D. degrees in chemical engineering. The M.S. degree is offered under Plan A and Plan B. In addition, an environmental engineering program, run jointly by the Department of Chemical Engineering, the Department of Petroleum Engineering, and the Department of Civil and Architectural Engineering, offers graduate programs leading to an M.S. in environmental engineering under either Plan A or Plan B.

Program Specific Admission Requirements

A. Admission Process and Requirements

Standard Admission

Admission is open to students with at least a bachelor's degree who meet the minimum requirements:

1. A GPA of 3.000 (A = 4.000), or equivalent;
2. A GRE score of 305 (combined verbal and quantitative sections)
3. For international applicants who did not attend an English-speaking program in an English-speaking country for all years of their highest degree:

A TOEFL score of 600 (paper-based), 250 (computer-based), or 80 (Internet based) or an IELTS score of 6.5.

Unofficial transcripts of all prior college-level coursework, test scores and recommendations from three references must be uploaded as parts of the application.

If admission is granted, then official transcripts, GRE and TOEFL scores are required.

The deadline to submit application credentials is February 1 (to be considered for Fall semester).

The application will not be processed until all the necessary documents have been uploaded.

B. Graduate Study Guidelines

All incoming Ph.D, M.S. Plan A and M.S. Plan B students must have an adviser. The student is responsible for contacting faculty members in order to find an adviser.

All Chemical Engineering graduate students must take the following Chemical Engineering Core courses:

1. Thermodynamics (CHE 5020)
2. Transport Phenomena (CHE 5010)
3. Reaction Kinetics (CHE 5030)
4. Mathematical Methods in Chemical Engineering (CHE 5355)

Credit Hours

Total (from above)	12
CHE 5960 Thesis Research	4
Electives	14
Total	30

Plan B (non-thesis)

The coursework requirements are the same as the M.S. Plan A requirements except that Thesis Research (CHE 5960) is not required. Plan B students take an additional 4 hours of elective course credits (total of 30 hours required).

M.S. Plan B students must write a paper on a topic assigned by the adviser. This paper must be submitted to the student's graduate committee for approval. A final presentation is then required.

Doctoral Program

Credit Hours

M.S. Plan A list (except CHE 5960).....	26
Graduate Teaching and Research: Theory and Methods (CHE 5090).....	3
Dissertation Research (CHE 5980).....	30
Electives (no internship CHE 5990)	13
Total	72

M.S. and Ph.D. Seminar Requirements

All chemical engineering graduate students must enroll in CHE 5890, Chemical Engineering Seminar, every semester. All seminars, including the required presentations described below, must be scheduled by the seminar coordinator. Registered off-campus graduate students can be exempt from having to enroll in CHE 5890.

Ph.D. Preliminary Examination

All Ph.D. students must pass a preliminary examination no later than the end of the student's fifth full semester in the graduate program and a least 15 weeks prior to the dissertation defense. Prior to attempting the Ph.D. preliminary examination, students must have completed all required core classes no later than the end of their fourth semester in the graduate program. Students must file a program of study prior to attempting the preliminary examination.

The goal of the preliminary exam is for the student to demonstrate his or her research progress to-date and present the research proposition that will be investigated and lead to his or her final dissertation. The preliminary exam consists of three components: a written document provided to each member of the student's graduate committee at least one week prior to the oral presentation; a public oral presentation; and a private examination by the student's graduate committee immediately following the oral presentation.

The written document may be in any format but must concisely provide a survey of the relevant literature, a summary of the student's progress to-date, and a clear, detailed plan for the successful completion of the proposed work. The preliminary exam oral presentation should be consistent with the written document. It should provide an appropriate literature background, demonstrate proficiency with proposed experimental/computational techniques, identify details of the experiments to be performed, and provide a timeline to final defense.

The student's committee will pass or fail the student on the strength of the preliminary examination, with an option to conditionally pass the student while requiring an interim committee meeting prior to the final Ph.D. examination. A form sent by the student's adviser to the Office of the Registrar reports the results of the examination.

M.S. Thesis or Ph.D. Final Examination (Dissertation Defense)

All M.S. Plan A and Ph.D. students must orally defend their thesis or dissertation at a public final examination. If, for any reason, a student's Ph.D. research goals are substantially changed after successful completion of the preliminary examination, the student must arrange a subsequent meeting to provide their committee with an accurate and current overview of their proposed work. The final examination consists of a public thesis defense in oral

presentation format. At least two weeks before the examination, the student must provide each member of the graduate committee with a copy of the written thesis of Ph.D. dissertation and provide the department an announcement of their defense for advertisement by bulletin board, e-mail, or other means. The results of the examination are reported on the Report of Final Examination form. Often, graduate committee members request changes in the thesis or dissertation, and they may postpone signing the form until they are satisfied that those changes have been made.

Publication of Thesis or Dissertation

After the defense, an electronic copy (in PDF format) of the thesis or dissertation must be uploaded in accordance with the directions provided on the Graduate Student Resources web site. This copy will be rejected if the format standards specified by the Thesis and Dissertation Format Guide are not met. This guide allows for a publication-ready format. If required by the department and/or committee, additional printed copies should be delivered to the University Store for binding. Students should consult with the adviser to determine if the adviser wants a copy of the thesis, dissertation, or other research documentation.

Chemical Engineering (CHE)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1005. Introduction to Chemical Engineering. 1. Provides an overview of chemical engineering and its role in the current technological importance: energy, biotechnology, production of chemicals, and materials processing. Introduces strategies for solving engineering problems, including ethical considerations and teamwork, discusses process variables, units, mass balance, and data analysis, and incorporates active learning exercises using spreadsheet to solve chemical engineering problems. *Prerequisite:* concurrent enrollment in MATH 2200.

2005 [3000]. Chemical Process Analysis. 3. Introduces analysis of chemical processes using stoichiometry, material and energy balances, thermodynamics and economics. *Prerequisites:* C- or better in either CHEM 1050 or CHEM 1020 and concurrent enrollment in MATH 2205. (Normally offered fall semester)

2060. Introduction to Chemical Engineering Computing. 3. Introduces chemical engineering problems, develops computational

skills needed to solve them, and reinforces a computational tool that will be useful for other CHE classes. *Prerequisites:* C- or better in CHE 1005 or ES 1060; C- or better in CHE 2005; concurrent enrollment in MATH 2310.

2070. Chemical Thermodynamics. 3. Discusses first and second laws of thermodynamics applied to chemical processes, production of power from heat, refrigeration, and liquefaction processes, develops thermodynamic relations for calculating thermodynamic properties of fluids, including the use of equations of state, and introduces heat effects, Gibbs-energy change of reaction, and chemical-reaction equilibria. *Prerequisites:* C- or better in CHE 2005, PHYS 1210; C or better in MATH 2210.

2080. Chemical Engineering Fluid Mechanics. 3. Introduces the fundamental aspects of macroscopic fluid mechanics, including physical properties, fluid statics, mass, energy, and momentum balances, momentum transport, and flow through pumps, pipes, and other chemical engineering equipment for both incompressible and compressible fluids, and of microscopic fluid mechanics, including differential mass and momentum balances. *Prerequisites:* C- or better in CHE 2005, PHYS 1210, and C or better in MATH 2210.

2090. Practical Fundamentals of Process Control. 2. Introduces students to sensors, valves, actuators and the assembly of process control components. Provide hands-on practical experience with level control, flow control, temperature control and pressure control processes. This course consists of one (1) hour of lecture and two (2) hours of laboratory per week. *Prerequisite:* C or better in MATH 2205.

3015 [3010]. Chemical Thermodynamics II. 3. Introduces mixture properties, such as chemical potentials, excess properties, partial molar properties, heats of mixing, fugacities, and practical tools for estimating them from solution theories and equations of state. These tools and concepts are applied to phase and chemical equilibria. *Prerequisite:* C or better in CHE 2060, and CHE 2070 or ES 2310. (Normally offered fall semester)

3026. Heat Transfer. 3. Introduces the theory and application of energy transport (e.g. conduction, convection, radiation), discusses in depth fundamentals of microscopic energy transport, and applies the knowledge to macroscopic chemical engineering processes and systems. *Prerequisites:* C- or better in CHE 2060, and CHE 2080 or ES 2330.

3028. Mass Transfer. 3. Introduces mass transfer concepts, including molecular diffusion, convective mass transfer, and mass

transfer between phases, and the development of mathematical models of these physical phenomena, applicable to the analysis and design of chemical processes. *Prerequisites:* C- or better in CHE 2005, CHE 2060, and CHE 2080 or ES 2330.

3035. Separation Processes. 3. Applies transport and equilibrium concepts and models to the analysis and design of separation processes, such as distillation, absorption, extraction, leaching, adsorption, crystallization, and membrane separation processes. *Prerequisites:* C or better in CHE 2060, and CHE 2070 or ES 2310.

3040. Unit Operations Laboratory I. 3. [WB◀(none)] Illustrates fluid-flow and heat-transfer principles with experiments, for example, on pipe flow, fluid viscosity and convective heat transfer. Emphasizes experimental-error analysis and technical communication, both written and oral. *Prerequisites:* C- or better in CHE 3026 and CHE 3028 and CHE 4060. (Normally offered fall semester)

3070. Process Simulation and Economics. 3. Introduces the process simulation software used in the chemical industry and its applications, including examples of heat and material balances, physical properties, phase and chemical equilibria, equilibrium-stage separations and costs and profitability analysis. *Prerequisites:* C- or better in CHE 2005, CHE 3015, and CHE 3026 and concurrent enrollment in CHE 3028.

3090. Applying Simulation to Dynamic Processes. 1. Introduces students to dynamic simulation software for controlling individual chemical engineering processes. This course consists of two (2) hours of laboratory per week. *Prerequisite:* C or better in CHE 2005.

3100. Fundamentals of Bioengineering. 3. An introduction to select biological concepts with emphasis on their relevancy to bioengineering. Topics include model organisms, cells and organelles, bioenergetics and metabolism, macromolecules, DNA replication and modern molecular biology methods, and control mechanisms. *Prerequisite:* C- or better in LIFE 1010.

3890. Engineering Honors Program Research Methods. 3. A general approach to scientific research and graduate school preparation. Topics will include: finding a research mentor, literature search skills, using the scientific method for approaching a research problem and developing a research methodology, writing a research funding proposal, delivering a research presentation and selecting and applying for graduate school. Restricted to College of Engineering Honors Program

students. Cross listed with ATSC/ARE/CE/COSC/EE/ES/PETE 3890. *Prerequisite:* sophomore standing.

3900. Undergraduate Research. 1-6 (Max. 6). Students carry out research appropriate to undergraduates, under faculty supervision. May be taken more than once. *Prerequisite:* junior standing in chemical engineering. (Normally offered each semester)

4000. Environment, Technology and Society. 3. Explores relationships among technology, the environment and society. Examines social and humanistic aspects of using current and future technology to understand and solve environmental problems. Cross listed with PETE 4000. *Prerequisites:* junior standing and completion of two lab sciences.

4050. Unit Operations Laboratory II. 3. Illustrates mass-transfer principles with experiments, for example, on extraction, gas absorption, and distillation. Emphasizes experiment planning and technical communication, both written and oral. *Prerequisite:* C- or better in CHE 3040. (Normally offered spring semester)

4060. Reaction Engineering. 3. Introduces chemical process kinetics, catalysis and reactor design. Includes homogeneous and heterogeneous reaction kinetics; design of batch, stirred-tank and tubular reactors; and nonisothermal operation. *Prerequisites:* C- or better in CHE 3015 and CHE 3026 and concurrent enrollment in CHE 3028. (Normally offered spring semester)

4070. Process Design I. 4. Encompasses engineering design of chemical processes. Introduces engineering economics, process safety management and environmental management. *Prerequisites:* C- or better in CHE 3028 and CHE 3070 and CHE 4060. (Normally offered fall semester)

4080. Process Design II. 4. [WC▶COM3] Intended for the last semester of the senior year. Applies all previous courses to the design of safe, economical and environmentally benign chemical processes. *Prerequisites:* C- or better in CHE 4070, and COM-2.

4090. Process Dynamics and Control. 3. Encompasses analysis and design control systems for the chemical process industry including steady-state approximation, types of controllers, simple unsteady-state analysis, use of mathematical models and process dynamics under control. *Prerequisites:* C- or better in CHE 3028 and CHE 4060.

4092. Controlling Process Systems. 3. Capstone process control course. Students will design process control for systems of linked processes including sensing and transmission, final control elements, and controller. This

course consists of two (2) hours of lecture and three (3) hours of laboratory per week. *Prerequisites:* C or better in CHE 3090 and concurrent enrollment in either CHE 4090, EE 4620, or EE 4621.

4100. Biochemical Engineering. 3. Applies chemical engineering principles to the analysis and design of biological processes widely used in the pharmaceutical, food and environmental remediation industries. Topics include kinetics of enzyme-catalyzed reactions, cellular growth and metabolism, bioreactor design and mass transfer considerations. Dual listed with CHE 5100. *Prerequisite:* Completion with a C- or better or concurrent enrollment in CHE 3100 or MOLB 2021.

4160. Biomedical Engineering-Transport Processes. 3. Focuses on chemical and physical transport processes with applications toward the development of drug delivery systems, artificial organs, bioartificial organs and tissue engineering. Involves topics covering body fluids, capillary solute transport, physical and flow properties of blood, tissue oxygen transport, pharmacokinetic models and cell physiology. *Prerequisites:* consent of instructor and grade of C or better in at least three courses counting no more than two from CHEM 1020, CHEM 1030, CHEM 1050, LIFE 1010, LIFE 1020 and at least one from LIFE 2022, MATH 2200, KIN 2040, MOLB 2021, MOLB 2240, CHE 3000, ES 2310.

4165. Biomaterials. 3. Material science and engineering of the various materials used for biomedical applications, in-depth discussion of the molecular and cellular interactions to implanted materials, as well as a survey of practical applications. Materials covered will include polymers, ceramics, metals, composites, silicones, and natural materials, such as collagen, elastic, and silk. Dual listed with CHE 5165. *Prerequisites:* LIFE 1010 and CHEM 1020 or CHEM 1050, or permission of instructor.

4200. Industrial Chemical Production. 3. Integration of chemical engineering and chemistry as practiced in modern industry. Engineering of chemical reactions and processes for commodity chemicals, petroleum-based fuels, petrochemicals, intermediates, specialty chemicals, pharmaceuticals, and engineered materials. Environmental strategies for waste minimization and pollution prevention. *Prerequisites:* CHEM 2420 and CHE 3015 (may be taken concurrently).

4210. Natural Gas Processes and Modeling. 3. After a quick introduction to the Hysys simulation program, the main chemical processes used to convert well-head gas

to products will be reviewed and modeled (fractionation train, sulfur recovery, tail gas clean-up, dehydration, refrigeration, nitrogen rejection) in high detail, including appropriate property models to use. *Prerequisite:* CHE 3070.

4220. Metabolic and Protein Engineering. 3. An introduction to the design of biological systems for conversion of a feedstock to product, with emphasis on synthetic biology and directed evolution design principles, evolutionary mechanisms and tradeoffs. Metabolic pathways and molecules of industrial importance will be discussed, as well as ethics as applied to synthetic biology and bioengineering. Dual listed with CHE 5220. *Prerequisite:* MOLB 2021 or concurrent enrollment in CHE 3100.

4270. Advanced Process Simulation. 3. Advanced topics for a commercial process simulation software that is routinely used in industry will be covered. Topics will include: electrolyte systems, physical property methods and regression of parameters, petroleum industry component selection and distillation, solids handling capabilities including coal processing, advanced recycle stream convergence techniques, and equation-oriented solution methods. *Prerequisite:* CHE 3070.

4430. Green Chemistry and Global Environmental Problems. 3. Focus includes study of the chemistry of air, water, and soil as well as the effects of anthropogenic activities on natural processes. Emphasis is also placed on sustainability and green chemistry practices and technologies. Cross listed with CE/ENR 4430. *Prerequisite:* CHEM 1020.

4580. Honors Undergraduate Research. 3. An independent research experience for undergraduate students enrolled in the Engineering Honors Program. Before registering for this class, students are responsible for discussing their interests with faculty, identifying a willing research mentor, obtaining approval by said mentor, and communicating the student/faculty partnership to the appropriate staff in their home department. Must be in the Engineering Honors Program. Cross listed with ATSC/BE/CE/COSC/ES/ESE/PETE 4580. *Prerequisite:* junior or senior standing.

4970. Internship in Chemical Engineering. 1-6 (Max. 6). Enables credit for students in appropriate engineering activities while serving as interns in an industrial, government, or other setting. *Prerequisite:* must be involved in a chemical engineering co-op/internship experience.

4972. Internship in Process Control Engineering. 1-6 (Max. 6). Enables credit for students serving as interns with an approved organization that provides process control and

instrumentation experience. *Prerequisite:* Be enrolled in the Process Control and Instrumentation minor.

4990. Topics in Chemical Engineering. 1-6 (Max. 6). Features topics not included in regularly offered classes. Section I is individual study. Other sections are group study by seminar or in class format. *Prerequisite:* CHE 3000 or concurrent enrollment.

5010. Transport Phenomena. 3. Examines the modeling of momentum, heat and mass transport. Cross Listed with PETE 5010. *Prerequisite:* ES 2330, MATH 2310, and graduate standing in Chemical or Petroleum Engineering.

5020. Thermodynamics. 3. Utilizing the laws of thermodynamics to a wide variety of process applications. Evaluating current methods for predicting thermodynamic properties of pure fluids and mixtures. Modeling multiphase, multicomponent equilibria. Cross listed with PETE 5020. *Prerequisite:* graduate standing.

5030. Reaction Kinetics. 3. An analysis of reactions involving phase boundaries, heterogeneous catalysis, gas-solid systems, and gas-liquid systems. *Prerequisite:* CHE 4060.

5060. Flow through Porous Media. 3. Review of properties of porous media. Relationships of permeability to porosity. Formulation of the Fundamental Flow equation. Constant Rate Solutions. Constant Pressure Solutions. The Principle of Superposition. Transient well testing of oil and gas reservoirs, including drawdown, build-up faulted systems, interference, drillstem tests, and isochronal test analysis. Dual listed with PETE 5060. *Prerequisite:* graduate standing.

5090. Graduate Teaching and Research: Theory and Methods. 3. A general approach to scientific research and graduate school. Topics include: purpose of graduate school, careers with graduate degrees, communication basics, literature search skills, presentations, research instrumentation, the scientific methods, developing hypotheses, grant proposal, and paper writing, research ethics, copyrights, patents, research notebooks, and classroom teaching techniques. *Prerequisite:* graduate standing.

5100. Biochemical Engineering. 3. Applies chemical engineering principles to the analysis and design of biological processes widely used in the pharmaceutical, food and environmental remediation industries. Topics include kinetics of enzyme-catalyzed reactions, cellular growth and metabolism, bioreactor design and mass transfer considerations. Dual listed with CHE 4100. *Prerequisite:* Completion with a C- or better or concurrent enrollment in CHE 3100 or MOLB 2021.

Department of Civil and Architectural Engineering

3074 Engineering Building,

(307) 766-2390

FAX: (307) 766-2221

Web site: www.uwyo.edu/civil/

Department Head: Anthony S. Denzer

Professors:

MICHAEL G. BARKER, B.S. Purdue University 1983; M.S. 1987; Ph.D. University of Minnesota 1990; Professor of Civil Engineering 2003.

KHALED KSAIBATI, B.S. Wayne State University 1984; M.S. Purdue University 1986; Ph.D. Purdue University 1990; Professor of Civil Engineering 2001; Director of the Wyoming Technology Transfer Center 2003, 1990.

MICHAEL A. URYNOWICZ, B.S. Michigan State University 1990; M.S. University of Wisconsin 1995; M.S. Colorado School of Mines 1998; Ph.D. 2000; Professor of Civil Engineering 2014, 2002.

JIANTING "JULIAN" ZHU, B.S. Zhejiang University 1983; M.S. Peking University 1985; Ph.D. Dalhousie University 1996; Professor of Civil Engineering 2019, 2012.

Associate Professors:

MOHAMED AHMED, B.S. Al-Azhar University 2001; M.S. University of Central Florida 2009; Ph.D. 2012; Associate Professor of Civil Engineering 2019, 2013.

JONATHAN A. BRANT, B.S. Virginia Military Institute 1998; M.S. University of Nevada 2000; Ph.D. 2003; Associate Professor of Civil Engineering 2014, 2008.

ANTHONY S. DENZER, B.A. University of California, Berkeley 1991; M.Arch. University of Kansas 1998; Ph.D. University of California, Los Angeles 2005; Associate Professor of Architectural Engineering 2011, 2005.

FRANCOIS JACOBS, B.S. California Baptist University 1995; M.B.A. University of Denver 2005; Ph.D. Colorado State University 2010; Associate Professor of Construction Management 2019.

DAVID J. MUKAI, B.S. University of Hawaii 1983; M.S. 1985; Ph.D. University of Washington 1991; Associate Professor of Civil Engineering 2005, 2001.

KAM NG, B.S. Iowa State University 1996; M.S. 1997; Ph.D. 2011; Associate Professor of Civil Engineering 2019, 2012.

NORIAKI OHARA, B.A. Chuo University 1997; M.A. 1999; Ph.D. University of California-Davis 2003; Associate Professor of Civil Engineering 2019, 2012.

GANG TAN, B.S. Tsinghua University 1998; M.S. 2001; Ph.D. M.I.T. 2005; Associate Professor of Architectural Engineering 2016, 2009.

JENNIFER E. TANNER, B.A. Eastern College 1994; B.S. Oklahoma State University 1995; M.S. University of Costa Rica 1998; Ph.D. University of Texas 2003; Associate Professor of Civil Engineering 2009, 2003.

LIPING WANG, B.S. Xi'an University of Architecture and Technology 2001; M.S. 2003; Ph.D. National University of Singapore 2007; Assistant Professor of Civil Engineering 2013.

Assistant Professors:

SHAWN C. GRIFFITHS, B.S. Utah State University 2009; M.S. University of Arkansas 2011; Ph.D. University of Austin 2015; Assistant Professor of Civil Engineering 2015.

CHENGYI (CHARLIE) ZHANG, B.S. Harbin University of Commerce 2007; M.S. China University of Mining and Technology, Beijing 2009; Ph.D. Illinois Institute of Technology 2013.

MILAN ZLATKOVIC, B.S. University of Belgrade 2005; M.S. University of Utah 2009; Ph.D. 2015; Assistant Professor of Civil Engineering 2016.

Academic Professionals:

JON A. GARDZELEWSKI, B.S. University of Wyoming 2002; M.Arch. University of Oregon 2005; Academic Professional in Architectural Engineering 2012, 2010.

Adjunct Faculty:

Aaron Cvar, Song Jin, James Kladianos, Marcie Miller, Chris Schabron

Professors Emeriti:

Leonard B. Baldwin, Jr., Arthur P. Boresi, Robert L. Champlin, Patricia J.S. Colberg, Charles W. Dolan, Thomas V. Edgar, K. James Fornstrom, David H. Foster, Victor R. Hasfurther, Michael Humenick, Don Lamb, Anton Munari, Larry O. Pochop, Jay Puckett, Richard J. Schmidt, James L. Smith, John P. Turner, Eugene M. Wilson

Civil Engineering

The mission of the department of Civil and Architectural Engineering and Construction Management at the University of Wyoming is:

To educate and prepare Civil & Architectural Engineering and Construction Management students to lead as designers, builders, project managers and entrepreneurs as it relates to the sustainable built and natural environments.

To develop technical solutions through research, innovation, and improved infrastructure to diversify and grow the economies that serve Wyoming and the world.

The civil engineering curriculum begins with a basic education in the physical, engineering, mathematical and computer sciences. This foundation supports further development of engineering topics that prepare the engineer to address critical societal needs. To meet these needs, the civil engineer designs and builds bridges, buildings, dams and hydraulic structures, pipelines and canals, power plants, transportation facilities, sanitary and environmental engineering facilities, surveying and mapping systems, space and ocean platforms, as well as numerous other engineering systems. The civil engineer must also be aware of the social, humanistic, and political aspects of their projects. Therefore, course work in the humanities and social sciences is required to better understand the social aspects of public works. During the last two years of their program, students may pursue several areas of civil engineering or, depending upon their interests, more specialized courses in one or more of the specific technical areas listed below. All students must have a comprehensive design experience.

Civil engineering degree candidates must meet the academic requirements of the college and in addition must have an average GPA of 2.000 (C) in courses required for the major. Students must complete a minimum of 42 upper division (junior/senior) or graduate-level semester credit hours. Students may have a maximum of 6 credits in courses with a grade of D in upper division CE courses that apply towards their degree program.

Computer Requirement

Many courses in Civil Engineering require students to have a laptop or tablet computer to bring to class, and to be able to download various software program (normally free). See www.uwyo.edu/civil/undergrad/laptop.html for more information.

Structural engineering: Analysis and design of structural systems including buildings, bridges, towers and other structures. Structural engineering also includes the study of solid mechanics and advanced structural materials.

Environmental engineering: Analysis, design and development of engineering systems to provide potable water supplies, treat municipal, industrial and hazardous wastes and protect human health and the environment.

Water resource engineering: Planning, analysis and design of hydraulic and hydrologic systems with respect to watersheds, municipalities, irrigation and drainage, and flood control. Conservation and management of groundwater and surface water are emphasized.

Transportation engineering: Planning, analysis and design of highways, traffic engineering and control, traffic safety, and pavement maintenance, design and rehabilitation.

Geotechnical engineering: Design and analysis of foundations, dams, embankments, slope stability and construction practices in soil and rock.

The civil engineering curriculum prepares the graduate to engage in professional practice, and upon completion of post-graduate requirements, to obtain registration as a Professional Engineer. It also provides the graduate with an excellent preparation for graduate studies in engineering, business or law.

CE Objectives

Three to six years after graduation, graduates of the University of Wyoming Civil Engineering Program will:

- CE-OB1. Be able to successfully practice the profession of Civil Engineering.
- CE-OB2. Be prepared and motivated to accept challenging assignments and responsibilities.
- CE-OB3. Demonstrate successful career growth.

CE Outcomes

The Civil Engineering department regularly evaluates the following student skills. Specifically, every University of Wyoming Civil Engineering graduate shall have:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts

5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Civil Engineering Curriculum

CE 1000: Vista Studio I.....	1
CE 1010: Civil Engineering Tools.....	3
CE 2000: Vista Studio II.....	3
CE 2070: Engineering Surveying.....	3
CE 3000: Vista Studio III.....	3
CE 3200: Structural Analysis I.....	3
CE 3210: Civil Engineering Materials.....	4
CE 3300: Hydraulic Engineering.....	3
CE 3400: Introduction to Environmental Engineering	3
CE 3500: Transportation Engineering.....	4
CE 3600: Soil Mechanics I.....	4
CE 4010: Civil Engineering Design.....	3
CHEM 1020: Gen Chemistry 1	4
ES 2110: Statics	3
ES 2120: Dynamics	3
ES 2310: Thermodynamics.....	3
ES 2330: Fluid Dynamics	3
ES 2410: Mechanics of Materials.....	3
MATH 2200: Calculus I.....	4
MATH 2205: Calculus II	4
MATH 2210: Calculus III.....	4
MATH 2310: Applied Differential Equations I	3
MSTP Elective, 3 courses	11
PHYS 1210 or 1220: Eng Physics I or II.....	4
Professional Development elective:	18
Science Elective: (Life, Earth, or Space Sciences Elective)	4
STAT 2050: Statistics.....	3

The Civil Engineering Science Elective must be from a third area of basic science beyond chemistry and physics. This includes life, earth, and space sciences.

Approved Electives

Math/Science/Technical Electives

To be selected from approved department list.

Science Electives

To be selected from approved department list.

Professional Development Elective (PDE) Guidelines

18 hours of structured Professional Development Electives (PDE) are required. A CDE activity must be included in those 18 hours. One Structural PDE is required. Electives are to be selected from at least three (3) areas of emphasis:

1. Environmental Engineering
2. Geotechnical Engineering
3. Structural Engineering
4. Transportation Engineering
5. Water Resources Engineering

Professional Development Elective (PDE) Courses

Environmental Engineering

CE 4400, CE 4410, CE/CHE/ENR 4430, CE/ENVE 4441, CE/CHE 54XX, CE 5400, CE/CHE 5410, CE 5425, CE/ENVE/CHE 5430, CE/EWE/CHE 5435, CE/EWE/CHE 5445, CE 5450

Geotechnical Engineering

If a Geotechnical course is selected, the first PDE must be one of the following:
CE 4610/5610, CE 4620/5660, CE 4630/5630, CE 5640

Structural Engineering

One of the following is required:
CE 4250, CE 4260

Beyond the requirement, any of the following:
CE 4200, CE 4265/5265, CE 4285/5285, CE 4295/5295, CE 5010, CE 5200, CE 5220, CE 5255, CE 5270, CE 5280, CE 5290

Transportation Engineering

If a Transportation course is selected, the first PDE must be one of the following:
CE 4510/5510, CE 4555/5555, CE 4530/5530

Beyond the requirement, any of the following:
CE 4970, CE 5540, CE 5560, CE 5570, CE 5575, CE 5585, CE 5590, CE 5700 (Traffic Flow, Traffic Simulation, or Public Transportation)

Water Resources Engineering

CE 4800, CE 4810/5810, CE 4870, CE 5300, CE 5321, CE 5700, CE 5830, CE 5850, CE 5865, CE 5880, CE 5885

Comprehensive Design Experience (CDE) Courses

One of the following is required:
CE 4900

A minimum of 42 credit hours must be upper division (3000+) level.

Transfer Coursework: All Wyoming Community College equivalent courses will be evaluated for acceptance into the CE program. For upper-division coursework, no more than two upper division courses may be transferred and applied to the CE degree. However, CE 4010 and CE 4900 cannot be transferred to UW. Exceptional cases will be considered by petition to the Civil & Architectural Engineering department.

Advanced Civil and Architectural Engineering Standing

All undergraduate students in Civil and Architectural Engineering must fulfill the Gateway Requirement prior to enrolling in any upper-division (3000-5000 level) courses taught in the College of Engineering and Applied Science.

To meet the Civil and Architectural Engineering Gateway Requirement, the student must earn a minimum of 57 Quality Points from any combination of the following seven classes or their equivalent. It is not necessary to complete all seven courses to fulfill the Gateway Requirement.

Gateway Courses

- CHEM 1020 - General Chemistry I
- PHYS 1210 - Engineering Physics I
or PHYS 1220 - Engineering Physics II
- MATH 2200 - Calculus I
- MATH 2205 - Calculus II
- ES 2110 - Statics
- ES 2120 - Dynamics
- ES 2410 - Mechanics of Materials

See the advising pages on the Civil and Architectural Engineering website for more information.

Graduate Study

Graduate Programs

An advanced degree in civil and architectural engineering is professionally and economically attractive. Advanced degrees are important for professional civil engineers in many specialized areas of civil engineering. Many consulting firms and industrial design groups require advanced knowledge gained from graduate studies. Engineers in such firms often work at the forefront of their profession. UW alumni are involved in design and construction of major projects worldwide.

An advanced degree is also required for careers in university teaching and research. A university career is highly recommended for those motivated students who are interested

in becoming leaders in education and in the development of new concepts, processes and inventions.

The Department of Civil and Architectural Engineering offers programs leading to the degrees of master of science and doctor of philosophy. Areas of study in the M.S. and Ph.D. programs include: environmental engineering, geotechnical engineering, structural engineering, transportation engineering, and water resources engineering. The department also offers a master of science in architectural engineering and a master of science in environmental engineering in cooperation with the Department of Chemical and Petroleum Engineering. Additional information is available from the department or from the Web page.

Program Specific Admission Requirements

Admission is open to all students holding a bachelor's degree with at least a 3.000 GPA from an accredited engineering curriculum and a GRE combined minimum score of 298.

Ph.D. applicants are reviewed with regard to stated interests, objectives and the ability of the department to provide a quality experience for the applicant.

International students must achieve a TOEFL score of 550 on the paper-based, a minimum of 76 on the internet-based or a minimum of 6.0 on the IELTS.

MSCE Quick Start Program

The MSCE Quick Start program in Civil and Architectural Engineering (CAE) is designed to present highly qualified UW students with the opportunity to begin graduate study while they complete their bachelor of science (B.S.) degree in civil engineering or architectural engineering. These students must apply for admission to the Quick Start program no later than the second semester of their junior year.

This program allows for early planning of the graduate portion of a student's education and provides more flexibility in the number of required courses and the order in which they are taken. The more efficient and better-planned use of time should result in reduction of the time required for obtaining the master of science in civil engineering (MSCE) degree. Students who enter the Quick Start program must accept the primary responsibility for actively planning their programs of study to assure timely completion of their coursework and research programs.

The Quick Start program contains two essential elements:

Qualified students may receive provisional admission to the civil engineering graduate program prior to completing the normal application process. This provisional admission will permit students to make their long-term educational plans earlier in their studies, thus providing enhanced opportunities for course selection and involvement in research.

Quick Start students are not required to submit GRE.

Students in the program may apply up to six credit hours of 4000 or 5000-level courses toward both the B.S. and M.S. degree programs. By completing successfully up to six credit hours of graduate classes during their senior year, these students will have demonstrated their ability to do graduate-level coursework as undergraduates, easing their transition to the civil engineering graduate program.

Quick Start applicants are not required to submit GRE scores, but are required to submit a complete application form. For additional information and an application form, please contact the CAE graduate program coordinator at (307) 766-2390 or stop by 3074 Engineering Building.

Program Specific Degree Requirements

Master's Program

Areas of study in the master of science program include: building mechanical systems engineering, environmental engineering, geotechnical engineering, structural engineering, transportation engineering, and water resources engineering. The master of science degree in each of these areas requires completion of 12 to 18 hours of engineering courses related to the particular program area.

Plan A (thesis)

The degree of master of science, Plan A, requires a minimum of 26 hours of coursework and a minimum of 4 hours thesis research in addition to the minimum requirements set forth in this bulletin.

Early in the program, the student must submit a program of study listing coursework for approval by the departmental graduate studies committee (CEGS), and the department head.

Plan A is required of all state or contract supported graduate assistants.

Plan B (non-thesis)

Requires a minimum of 30 hours of coursework and a Plan B paper, in addition to the minimum requirements set forth in this bulletin.

Early in the program, the student must submit a program of study listing coursework and the course number that the Plan B paper covers for approval by the CEGS and the department head.

Doctoral Program

Areas of study in the doctor of philosophy program include: building mechanical systems engineering, environmental engineering, geotechnical engineering, structural engineering, transportation engineering, and water resources engineering.

Minimum of 42 hours of coursework beyond the baccalaureate, 36 hours of which must be 5000-level (graduate-level) courses or the equivalent, and concentrated independent research leading to an acceptable dissertation.

In addition to expertise in the specific dissertation topic, the candidate must demonstrate competence in two or more research areas that will help to insure a high-quality dissertation acceptable to the student's graduate committee.

Subject to department and university requirements, the student's coursework is arranged by consultation between the student, his or her adviser, and his or her committee, and must also be approved by the CEGS and by the department head.

Coursework is defined in a program of study that should be filed by the end of the second semester of the Ph.D. program.

At a time near the completion of formal coursework, the student is required to take and pass a preliminary examination on the Ph.D. coursework and, as a part of the examination, is required to present a written and oral dissertation proposal to his or her committee for approval.

Finally, the student must demonstrate research competence in an oral defense of the dissertation and must submit an acceptable written version of the dissertation to his or her graduate committee in a timely manner to meet deadlines. In addition, the student is to meet the minimum requirements set forth in this bulletin.

Civil Engineering (CE)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀Q]).

1000. VISTA Studio I. 1. Introduction to civil and architectural engineering professions through exploration of modern engineering challenges. Students work on a design project, starting with problem definition and working towards concept designs using spreadsheet and communication tools. Professional topics introduced include globalizability, diversity, professional ethics, design limitations and constraints, sustainability, environmental stewardship, and engineering economics. Cross listed with ARE 1000. *Prerequisites:* Corequisites of MATH 1450 or MATH 1405.

1010. Civil Engineering Tools. 3. This course is an introduction to computing tools commonly used in civil engineering practice including 3-D Computer Aided Drafting, Spreadsheets and Presentation Software. Tools will be introduced through design work on typical civil engineering design projects. *Prerequisites:* Corequisite of MATH 2200.

2000. VISTA Studio II. 3. Students work on a real-world project throughout the semester. Professional topics introduced include project management, engineering economic analysis methods, project estimating, professional ethics, engineering business practices common to the civil and architectural engineering professions, and professional leadership. Cross listed with ARE 2000. *Prerequisites:* Corequisites: ARE 1600 or CE 1010 and MATH 2205.

2070. Engineering Surveying. 3. Principles of measurements of distances, elevation and angles. Basic error theory in measurement and calculations. Traverse field techniques and office calculations. Basic principles of surveying and map making. *Prerequisite:* Corequisite of MATH 1450 or MATH 1405.

3000. VISTA Studio III. 3. Students will apply professional skills such as project management, engineering economics, professional ethics, and sustainability to an integrated design project. The role of permitting, regulations, and professional codes to design problems will also be explored. Cross listed with ARE 3000. *Prerequisites:* ARE 2000 or CE 2000, and ES 2410.

3200. Structural Analysis I. 3. [WB◀(none)] Introductory design and analysis topics in loads on building, stress and displacement analysis of structures, including beams, trusses and frames, classical flexibility and stiffness methods. Cross listed with ARE 3200. *Prerequisite:* ES 2410.

3210 [2210]. Civil Engineering Materials. 4. [WB◀COM3] Laboratory investigation and design of materials used in civil engineering: metals, masonry, concrete and timber. Non-destructive evaluation of materials. Analysis and presentation of data, including various types of written reports and oral presentations. Cross listed with ARE 3210. *Prerequisites:* COM2 and ES 2410.

3300 [4320]. Hydraulic Engineering. 3. Develops analysis, design and modeling techniques for incompressible pipe flow, steady uniform and gradually varied open channel flow, and hydraulic structures. *Prerequisite:* ES 2330.

3400. Introduction to Environmental Engineering. 3. An introduction to the major topics in environmental engineering. Focus areas include water supply, wastewater treatment, air pollution control and solid and hazardous waste management. Quantitative aspects and engineering solutions to problems are emphasized. *Prerequisites:* MATH 2205 and CHEM 1020 or equivalent.

3500 [4500]. Transportation Engineering. 4. Introduction to the major topics in Transportation Engineering. Focus areas include roadway and non-motorized facility design, traffic operations, transportation planning, and pavement materials and design. *Prerequisite:* CE 1010.

3600 [4600]. Soil Mechanics I. 4. A study of soil and the properties which influence its usefulness as an engineering material. Principles governing movement of soil, water and propagation of stresses through soil masses are studied. *Prerequisite:* ES 2410.

3890. Engineering Honors Program Research Methods. 3. A general approach to scientific research and graduate school preparation. Topics will include: finding a research mentor, literature search skills, using the scientific method for approaching a research problem and developing a research methodology, writing a research funding proposal, delivering a research presentation and selecting and applying for graduate school. Restricted to College of Engineering Honors Program students. Cross listed with ATSC/ARE/CHE/COSC/EE/ES/PETE 3890. *Prerequisite:* sophomore standing.

4010 [3010]. Civil Engineering Design. 3. Students will prepare final civil engineering documents including construction plans, specifications, and engineering estimates for a civil engineering project. Concepts of standard specifications and sustainability measures will also be applied to the design. *Prerequisites:* ARE 3000 or CE 3000, and STAT 2050.

4200. Structural Analysis II. 3. Stress and displacement of indeterminate structures. Determination of loads on buildings. Matrix stiffness methods. Cross listed with ARE 4200. *Prerequisite:* ARE/CE 3200.

4250. Structural Steel Design. 3. Design of structural components and applications utilizing steel. Cross listed with ARE 4250. *Prerequisite:* ARE/CE 3200.

4260. Structural Concrete Design. 3. Design of structural components and applications utilizing reinforced concrete. Cross listed with ARE 4260. *Prerequisite:* ARE/CE 3200.

4265. Prestressed Concrete Design. 3. This is a classical course on designing prestressed and precast concrete systems. Principles and behavior of prestressed concrete build the foundation for topics that included flexure, shear, and axial load, construction and fabrication, and application. The course continues with fundamental concepts taught in ARE/CE 4260. Dual listed with CE 5265. Cross listed with ARE 4265. *Prerequisite:* ARE/CE 4260.

4285 [4280]. Masonry Design. 3. Design of structural components in reinforced masonry buildings, including walls, columns, beams and connections. Particular attention is paid to current codes, specifications and analysis. Cross listed with ARE 4285. Dual listed with ARE 5285 and CE 5285. Offered on a three semester rotation. *Prerequisites:* ARE/CE 4260 and ARE/CE 3200.

4295 [4290]. Structural Timber Design. 3. Design of structural components and applications utilizing timber. Cross listed with ARE 4295. Dual listed with CE 5295. *Prerequisite:* CE 3200 or equivalent.

4400. Design of Water Treatment Facilities. 3. A theoretical and practical design course for municipal potable water treatment systems. Major emphasis includes health criteria, operational control procedures, primary and secondary drinking water regulations, as well as the latest treatment design standards for production of drinking water. *Prerequisite:* CE 3400.

4410. Design of Wastewater Treatment Facilities. 3. A theoretical and practical design course for treatment of municipal wastewaters. Major areas of emphasis include waste characterization and physical, chemical and biological unit processes. *Prerequisite:* CE 3400.

4430 [3420, 2420]. Green Chemistry and Global Environmental Problems. 3. Focus includes study of the chemistry of air, water, and soil as well as the effects of anthropogenic activities on natural processes. Emphasis is also placed on sustainability and green chem-

istry practices and technologies. Cross listed with CHE/ENR 4430. *Prerequisite:* CHEM 1020.

4441 [4440]. Solid Waste Engineering. 3. Municipal solid waste characteristics and quantities, collection, landfills, processing of municipal solid waste, materials separation, combustion and energy recovery, and biochemical processes with an emphasis on materials flow. Integrated solid waste management principles are also discussed. *Prerequisite:* CE 3400.

4510 [5510]. Pavement Design for Airports and Highways. 3. Designing flexible and rigid pavements for highways and airports. Topics include pavement materials and common uses, soil stabilization, quality control of materials, pavement design procedures. Dual listed with CE 5510. *Prerequisite:* CE 3500 or 3600.

4530. Traffic Engineering: Operations. 3. Basic characteristics of traffic, such as drivers, vehicles, volumes, speeds, delay, origins and destinations, intersection performance, capacity, termination and accidents; techniques for making traffic engineering investigations; traffic laws and ordinances, regulations, design and application of signal systems; curb parking control; enforcement and traffic administration; and public relations. Dual listed with CE 5530. *Prerequisite:* CE 3500.

4555 [4520]. Geometric Design of Highways. 3. Criteria controlling geometric design of highways including design speed, design volume, vehicle requirements and capacity design standards for different highway types; design of sight distance, alignment, grade; cross-section design; access control, frontage roads; intersection design elements, and design of intersections and interchanges. Students may not receive credit for both CE 4555 and CE 5555. Dual listed with CE 5555. *Prerequisite:* CE 3500.

4565. Traffic Simulation. 3. Traffic modeling and simulation study development; definition, construction, calibration, validation of traffic simulation models; traffic flow dynamics in transportation networks; mathematical optimization of transportation networks; traffic simulation software. Dual listed with CE 5565. *Prerequisite:* CE 3500.

4580. Honors Undergraduate Research. 3. An independent research experience for undergraduate students enrolled in the Engineering Honors Program. Before registering for this class, students are responsible for discussing their interests with faculty, identifying a willing research mentor, obtaining approval by said mentor, and communicating the student/faculty partnership to the appropriate staff in

their home department. Must be in the Engineering Honors Program. Cross listed with ATSC/BE/CHE/COSC/ES/ESE/PETE 4580. *Prerequisite:* junior or senior standing.

4610. Foundation Engineering. 3. Site characterization, laboratory shear tests and determination of soil properties. Analyses include bearing capacity, stress distribution and settlement. Design of shallow and control of deep foundations using static and dynamic methods. Dual listed with CE 5610. *Prerequisite:* CE 3600.

4620. Soil and Rock Slope Engineering. 3. Advanced engineering and geologic classification of landslides; detailed field investigations; solid and rock strength properties for stability analysis; advanced analytical and numerical methods for analysis of slope stability; design of engineered stabilization systems. Dual listed with CE 5660. *Prerequisites:* CE 3600.

4630. Ground Improvement, Reinforcement and Treatment. 3. This course is designed to help students understand a number of available geotechnical ground improvement, reinforcement and treatment techniques currently in use. Dual listed with CE 5630. *Prerequisite:* CE 3600.

4650. Instrumentation in Civil Engineering. 3. This lab based course will provide hands on learning to students to install instruments, collect data, analyze results, and use civil engineering judgment to make decisions. Dual listed with CE 5650. *Prerequisite:* ES 2410.

4800. Hydrology. 3. Analysis of elements of the hydrologic cycle and design with emphasis on precipitation, evapotranspiration, infiltration, runoff and groundwater. Precipitation/Runoff relationships, routing methods, flood prediction, groundwater yield and drawdown in unconfined and confined aquifers, unsteady well behavior, and method of images are also introduced. *Prerequisite:* CE 3300.

4810. Groundwater Hydrology. 3. Principles and basic equations associated with saturated and unsaturated flow in soils describing groundwater and drainage flow. Laws governing the movement, recharge, and production of underground water with special emphasis on techniques and modeling methods for development of groundwater resources. Dual listed with CE 5810. *Prerequisite:* ES 2330.

4840. Groundwater Contamination. 3. Develop principles and fundamental parameters that control groundwater flow and solute transport in groundwater systems. Introduce basic geochemical processes and contaminant chemistry and site monitoring techniques relevant to groundwater problems. Dual listed with CE 5840. *Prerequisite:* CE 4810 or equivalent.

4870. Water Resource Engineering. 3. Study in water resource planning and design and problem solving applying engineering principles and procedures. Western United States water problems are emphasized, including user completion, reallocation, consumptive use, water development, conservation, conveyance losses, and return flows. Dual listed with CE 5870. *Prerequisite:* CE 3300.

4900. Comprehensive Design Experience. 3. Team comprehensive project design experience considering the sub-disciplines of civil engineering. *Prerequisites:* 3 of CE 3200, CE 3300, CE 3400, CE 3500, CE 3600, and two of CE 4250, CE 4260, CE 4610, CE 4555, CE 4510, CE 4400, CE 4410, or CE 4800, or instructor consent.

4920. Senior Civil Engineering Problems. 1-3 (Max. 6). A study of current engineering problems that are applicable to civil engineering either on an individual basis or for small seminar type groups. *Prerequisite:* senior standing or approval of department head.

4959. Enrichment Studies. 1-4 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may NOT be included in an undergraduate or graduate program of study for a degree or for credit towards a certificate program. *Prerequisite:* consent of instructor.

4965. Undergraduate Research. 1-3 (Max. 3). Research activities on a relevant project of limited scope or as part of a laboratory project of greater scope under the advisement of a faculty member or mentor. The normal workload for 3 credits is considered to be 9 hours per week. Students will present at Undergraduate Research Day. *Prerequisite:* CE/ARE 1000.

4970. Wyoming D.O.T. Design Squad Cooperative Experience. 3. Experience with Wyoming Department of Transportation design procedures and fundamentals. Participation in development of design documents used to construct actual projects. Offered S/U Only. *Prerequisites:* selection for Laramie Design Squad employment and consent of department head.

4975. Civil and Architectural Engineering Internship. 1-3 (Max. 3). Students may apply for credit for extended work experience (>10 weeks; full-time) at a professional engineering or architectural firm, supervised by a licensed professional. Students should apply through their adviser prior to the work experience. Enrollment is by departmental approval only. Offered summer only. Cross listed with ARE 4975. *Prerequisite:* consent of department head.

5010. Advanced Mechanics of Materials. 3. Elements of elasticity, unified approach to strength of structural members design and failure criteria; basic concepts of fracture mechanics; stress concentration factors; treatment of torsion, bending, axial and shear in structural members including plastic effects; bending of flat plates. *Prerequisite:* ME 3010 or CE 3200, MATH 2310.

5040 [5020]. Introduction to Finite Element Analysis. 3. An introduction to the theory and application of finite elements to the solution of various problems with emphasis on structural mechanics. Includes development of the underlying matrix equations, the treatment of element generation and properties, and implementation of boundary conditions. Cross listed with ME 5040. *Prerequisite:* MATH 2310 and (CE 4200 or ARE 4200 or ME 3010).

5045. Advanced Finite Element Analysis. 3. Advanced topics in finite element analysis with emphasis on mathematical foundations of the method, numerical algorithms for software implementation, and analysis of problems with material and geometric nonlinear behavior. Cross listed with ME 5045. *Prerequisite:* ME 4040 or ME 5040 or CE 5040.

5200. Advanced Structural Analysis. 3. Analysis of framed structures with stiffness-based matrix methods including plane trusses, frames, and grid systems and space trusses and frames. Column, beam, beam-column and frame stability. Geometric and material nonlinearities of framed structures. Plastic analysis and moment-curvature relationships. Computer applications are emphasized. *Prerequisite:* CE 4200 or equivalent.

5220. Structural Dynamics. 3. Introduction to general structural dynamics, general dynamic loading, generalized coordinated and nonlinear structural response, linear and nonlinear response spectra, multiple degree of freedom systems, continuous systems, and discretization of continuous systems. Introduction to seismic load specifications. *Prerequisite:* CE 4200 or equivalent and MATH 2310.

5230. Advanced Materials. 3. The objective of this course is to introduce the graduate student to the behavior of various materials found in typical structural engineering applications and to the mechanics of obtaining materials properties and structural response. *Prerequisite:* CE 4260.

5240. Structural Systems Design. 1-5 (Max. 6). A comprehensive design course for steel and reinforced concrete building structures. Topics include preliminary design, selection of framing systems, braced and unbraced

frames, stability effects and nonlinear behavior. Students use case studies to develop design alternatives. *Prerequisite:* CE 4200, 4250, 4260.

5255. Advanced Steel Design 3. A comprehensive design course for steel building structures. Topics include preliminary design, selection of framing systems, braced and unbraced frames, stability effects and nonlinear behavior. Includes building design project for seismic regions. *Prerequisites:* grade of C or better in CE or ARE 4250.

5265. Prestressed Concrete Design. 3. This is a classical course on designing prestressed and precast concrete systems. Principles and behavior of prestressed concrete build the foundation for topics that included flexure, shear, and axial load, construction and fabrication, and application. The course continues with fundamental concepts taught in ARE/CE 4260. Dual listed with CE 4265. Cross listed with ARE 5265. *Prerequisite:* ARE/CE 4260.

5270. Highway Bridge Engineering. 3. A study of the analysis, design and rating of highway bridges, including consideration of dead and vehicular loads, analysis of typical systems, service, fatigue and ultimate strength behavior, rating of existing bridge design, and bridge operations. Composite and non-composite steel and concrete bridges are considered. Includes investigations that require field trips outside the schedule class times. Contemporary issues are routinely discussed. *Prerequisites:* CE 4250 and 4260.

5280. Behavior of Reinforced Concrete. 3. Broad-based coverage of the behavior of concrete, both at the member and structure level. The course will have no assigned text, although students will be expected to have an undergraduate concrete design textbook and a current ACI Code. Readings will include a number of technical papers in each area covered. Emphasis will be on the background of the code, code development, and investigative techniques. *Prerequisite:* CE 4200 and 4260.

5285. Masonry Design. 3. Design of structural components in reinforced masonry buildings, including walls, columns, beams and connections. Particular attention is paid to current codes, specifications and analysis. Cross listed with ARE 5285. Dual listed with ARE 4285 and CE 4285. Offered on a three semester rotation.

5290. Earthquake Engineering. 3. Second course in a series to design earthquake resistant structures. Topics include interpreting code requirements, calculating design forces on structures, evaluating inelastic behavior of structures, understanding how materials behave and advances in earthquake engineering. *Prerequisite:* CE 5220.

5295. Structural Timber Design. 3. Design of structural components and applications utilizing timber. Cross listed with ARE 5295. Dual listed with CE 4295. *Prerequisite:* CE 3200 or equivalent.

5300. Open-Channel Hydraulics. 3. Analysis and design of steady, uniform, gradually varied and spatially varied flow in open channels. Emphasis on basic fluid flow equations associated with natural and man-made open channels. *Prerequisite:* CE 3300.

5321. Engineering and Environment Geophysics. 3. Theoretical background for electrical, electromagnetic, georadar, and other near-surface geophysical measurements. Practical exercises focused on modeling, inversion, data analysis and experimental design. Discussion of applications to engineering and environmental problems. Basic knowledge of MATLAB programming language is helpful, but not required. Cross listed with GEOL 5321. *Prerequisite:* MATH 2250 or MATH 2200.

5400. Water Treatment. 3. Advanced theory and practice of collection, purification, and distribution of potable water; special emphasis on purification techniques, and plant requirements and design. *Prerequisite:* CE 4400.

5410. Advanced Biological Wastewater Treatment. 3. Theory and practice of advanced biological treatment processes for municipal and industrial wastewaters, sludges, groundwater bioremediation and solid waste. Emphasis is on fundamental principles applied to the design and control of existing processes and the development of innovative systems. Cross listed with CHE/ENVE 5410. *Prerequisites:* consent of instructor.

5430.

5435. Environmental Transport Processes. 3. Designed for graduate students and engineering seniors interested in the principles of mass transport and their application to environmental systems. Deals with the hydrodynamics of mixing and transport, as well as the interaction of mixing and various reaction rate processes. Applications include water and wastewater treatment, groundwater pollution, and transport and mixing in rivers, lakes and reservoirs. Cross listed with ENVE 5435 and CHE 5435. *Prerequisite:* MATH 2310 and ES 2330.

5445. Hazardous Waste Site Remediation. 3. The contamination of soil, air, and groundwater by improper disposal of hazardous wastes is covered. Control and cleanup of contaminated groundwater plumes, treatment of polluted soils and soil gases is emphasized. Case studies are extensively used. Cross listed with ENVE 5445 and CHE 5445. *Prerequisite:* CE 3400.

5450. Advanced Physical-Chemical Treatment. 3. A study of physical and chemical processes for treatment of water and waste water. Cross listed with ENVE 5450. *Prerequisite:* CE 4400.

5510. Pavement Design for Airports and Highways. 3. Designing flexible and rigid pavements for highways and airports. Topics include pavement materials and common uses, soil stabilization, quality control of materials and pavement design procedures. Dual listed with CE 4510. *Prerequisite:* CE 3500 or 3600.

5530 [5520]. Traffic Engineering: Operations. 3. Basic characteristics of traffic, such as drivers, vehicles, volumes, speeds, delay, origins and destinations, intersection performance, capacity, termination and accidents; techniques for making traffic engineering investigations; traffic laws and ordinances, regulations, design and application of signal systems; curb parking control; enforcement and traffic administration; and public relations. Dual listed with CE 4530. *Prerequisite:* CE 3500.

5540. Traffic Control. 3. Planning, designing, and operating transportation facilities to optimum efficiency using traffic control devices. Topics included are traffic flow theory; pavement markings, signing, and signal design; computer design of signal systems using linear and network models; traffic control in construction areas. *Prerequisite:* CE 3500 and ES 2110.

5545. Transport Network Analysis. 3. Traffic assignment and network modeling techniques; deterministic and stochastic user equilibrium assignment; mathematical programming formulations and solution algorithms; extensions to basic models; and applications to roadway pricing and other planning scenarios. *Prerequisite:* graduate standing in civil engineering.

5555. Geometric Design of Highways. 3. Criteria controlling geometric design of highways including design speed, design volume, vehicle requirements and capacity design standards for different highway types; design of sight distance, alignment, grade; cross-section design; access control, frontage roads; intersection design elements; and design of intersections and interchanges. CE 5555 students are required to do an additional integrated design term project using design software. Students may not receive credit for both CE 4555 and CE 5555. Dual listed with CE 4555. *Prerequisites:* CE 3500.

5560. Traffic Safety. 3. Safety design and operational practices for streets and highways including safety improvement programs, design of barrier systems, bicycle and pedestrian

consideration; access control; safety evaluation; and measures of effectiveness. *Prerequisite:* CE 3500 and STAT 4220.

5565. Traffic Simulation. 3. Traffic modeling and simulation study development; definition, construction, calibration, validation of traffic simulation models; traffic flow dynamics in transportation networks; mathematical optimization of transportation networks; traffic simulation software. Dual listed with CE 4565. *Prerequisite:* graduate standing.

5570. Transportation Planning. 3. Short and long-range transportation planning; land-use planning, travel behavior and transportation studies including demand forecasting; parking and transit studies; highway and street planning; and freight transportation and multi-model planning. *Prerequisite:* CE 3500.

5575. Intelligent Transportation Systems. 3. The use of Intelligent Transportation Systems (ITS) to improve the safety, efficiency, reliability, and/or security of transportation systems. Covers ITS applications, technologies, deployment issues, and system performance in both urban and rural environments. *Prerequisites:* CE 3500.

5585. Pavement Management Systems. 3. A study of the systems that a transportation agency may utilize to manage the pavement in their road network. History and purpose of pavement management are studied as well as how to make objective pavement management decisions. The distinction between project-level and network-level management concerns is explored and the implementation of a pavement management system is studied. Finally, methods for utilizing the information from the management system is studied. *Prerequisite:* CE 3500.

5590. Pavement Materials. 3. Selecting materials for highway construction, testing aggregates and bituminous materials, designing and testing asphalt mixtures; and recommending maintenance and rehabilitation strategies for deteriorated pavements. *Prerequisite:* CE 3500.

5610. Foundation Engineering. 3. Site characterization, laboratory shear tests and determination of soil properties. Analyses include bearing capacity, stress distribution and settlement. Design of shallow and control of deep foundations using static and dynamic methods. Dual listed with CE 4610. *Prerequisite:* CE 3600.

5630. Ground Improvement, Reinforcement and Treatment. 3. This course is designed to help students understand a number of available geotechnical ground improvement, reinforcement and treatment techniques currently in use. Dual listed with CE 4630. *Prerequisite:* CE 3600.

5650. Instrumentation in Civil Engineering. 3. This lab based course will provide hands on learning to students to install instruments, collect data, analyze results, and use civil engineering judgment to make decisions. Dual listed with CE 4650. *Prerequisite:* ES 2410.

5640. Geotechnical Earthquake Engineering. 3. The purpose of this course is to familiarize students with the field of geotechnical earthquake engineering and soil dynamics. Lectures will focus on stress wave propagation in soil and rock; characterization of earthquakes and ground motions; influence of soil conditions on seismic ground motion characteristics; and liquefaction of soils. *Prerequisite:* CE 3600 or graduate standing.

5660. Soil and Rock Slope Engineering. 3. Advanced engineering and geologic classification of landslides; detailed field investigations; solid and rock strength properties for stability analysis; advanced analytical and numerical methods for analysis of slope stability; design of engineered stabilization systems. Dual listed with CE 4620. *Prerequisite:* graduate standing.

5700. Civil Engineering Problems I. 1-3 (Max. 6). A special course, designed to make possible the study and investigation of problems or phases of civil engineering selected to fit the needs of the students. *Prerequisite:* consent of instructor.

5710. Civil Engineering Seminar I. 1-3 (Max. 6). A seminar type class furnishing motivation for advanced study of current problems in broad field of civil engineering by means of library research, study of current literature, and carefully guided class discussion. *Prerequisite:* consent of instructor.

5720. Civil Engineering Problems II. 1-3 (Max. 6). A special course designed to make possible the study and investigation of problems or phases of civil engineering selected to fit the needs of the student. *Prerequisite:* consent of instructor.

5730. Civil Engineering Seminar II. 1-3 (Max. 6). A seminar-type class furnishing motivation for advanced study of current problems in the broad field of engineering by means of library research, study of current literature, and carefully guided class discussions. *Prerequisite:* consent of instructor.

5785. H.T. Person Seminar. 3. Special topics in engineering as presented by the H.T. Person distinguished professor. *Prerequisite:* graduate standing.

5810. Groundwater Hydrology. 3. Principles and basic equations associated with saturated and unsaturated flow in soils describing groundwater and drainage flow. Laws governing the movement, recharge, and production of underground water with special emphasis on

techniques and modeling methods for development of groundwater resources. Dual listed with CE 4810. *Prerequisite:* CE 4800.

5820. Design of Small Earth Dams. 3. Develop understanding, analysis, design and construction techniques for all components considered in small earth dam design. Integration of hydrology, hydraulics and soil mechanics into a sound dam design. Dam design will be emphasized from foundation through embankment. *Prerequisite:* CE 3300, 3600 and 4800 or concurrent enrollment.

5830. Flow in Porous Media. 3. Examines fluid (liquid, gas, vapor) and heat flow in porous media and its effects specifically in soil. Near surface effects (impibation, infiltration and evaporation) is emphasized. Analytic and numerical solution techniques will be developed. *Prerequisite:* CE 5810 or consent of instructor.

5840. Groundwater Contamination. 3. Develop principles and fundamental parameters that control groundwater flow and solute transport in groundwater systems. Introduce basic geochemical processes and contaminant chemistry and site monitoring techniques relevant to groundwater problems. Dual listed with CE 4840. *Prerequisite:* CE 5810 or equivalent.

5850. Advanced Subsurface Hydrology. 3. This course introduces recent advances in dealing with uncertainty issues in subsurface hydrology. Covered topics include reviewing basic statistics required for the course and subsurface flow and transport, uncertainty analysis using Monte Carlo simulations, sensitivity analysis in flow and contaminant transport, heterogeneity of hydrological processes in subsurface, and Bayesian updating. *Prerequisite:* CE 5810 or CE 4800.

5865. Deterministic Hydrology. 3. Philosophy of modeling, hydrologic model formulation and design; lumped, semi-distributed, and physics-based hydrologic models for watershed- and landscape-scale predictions; process-level mathematical and numerical descriptions and coupling; model calibration, testing, and validation; parameterization, numerical approximations of flow equations; scale effects, modeling ethics. *Prerequisite:* CE 4800.

5870. Water Resource Engineering. 3. Study in water resource planning and design and problem solving applying engineering principles and procedures. Western United States water problems are emphasized, including user completion, reallocation, consumptive use, water development, conservation, conveyance losses, and return flows. Dual listed with CE 4870.

5875. Probabilistic Hydrology. 3. Introduction to the language, methods and tools in systems analysis in stochastic hydrologic modeling; parameter estimation; sensitivity analysis; optimization schemes; uncertainty analysis; probabilistic forecasting; state-space modeling with Kalman filtering, and data assimilation. *Prerequisite:* CE 4800.

5880. Advanced Hydrology. 3. Advanced hydrologic analysis for the Mountain States, principles of hydrological system, and numerical models. *Prerequisite:* MATH 2310.

5885. Hydrometeorology. 3. Global radiation budget, global hydrologic cycle, precipitation formation, occurrence and remote sensing, snow melt, evapotranspiration, interception, infiltration and runoff generation mechanisms, overland flow, land surface modeling, stream routing. *Prerequisite:* CE 3300.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* Enrolled in a graduate degree program.

5980. Dissertation Research. 1-12 (Max. 48). Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrolled in a graduate level degree program.

Architectural Engineering

Architectural Engineering is a rapidly expanding profession that deals with the myriad aspects of buildings and their design, construction and operation. Architectural engineers are typically specialists, responsible for the design and integration of such building elements as the structural, plumbing, fire protection, heating and air conditioning, or lighting and electrical systems. The curriculum in architectural engineering is designed to acquaint students with the various aspects of building design and construction and exposes them to a variety of courses dealing with dif-

ferent building materials and systems. The curriculum also includes course work in the humanities and social sciences, both to enrich the student's academic experience and assist in dealing with and contributing to society. The program leads to a Bachelor of Science in Architectural Engineering, preparing graduates to engage in practice as Professional Engineers upon completion of post-graduate registration requirements. Graduate work with emphasis in Architectural Engineering leading to a Master of Science and Doctor of Philosophy degree is offered through the Civil and Mechanical Engineering Programs. Additionally, advanced study can also be pursued in allied areas such as architecture, business or other engineering fields.

Students choose an area of emphasis in either structural or mechanical systems and select courses from approved electives, usually beginning their elective sequence in the second semester of their junior year. Consult with the Civil and Architectural Engineering Department for current elective lists.

Architectural engineering degree candidates must meet the academic requirements of the college and in addition must have an average GPA of 2.000 (C) in courses required for the major. Students must complete a minimum of 42 upper division (junior/senior) or graduate-level semester credit hours.

Students may have a maximum of 6 credits in courses with a grade of D in upper division ARE courses that apply towards their degree program.

Computer Requirement

Many courses in Architectural Engineering require students to have a laptop or tablet computer to bring to class, and to be able to download various software programs (normally free). See www.uwyo.edu/civil/undergrad/laptop.html for more information.

Architectural Engineering Objectives

Three to six years after graduation, graduates of the University of Wyoming Civil Engineering Program will:

- ARE-OB1 Be able to successfully practice the profession of Architectural Engineering.
- ARE-OB2 Be prepared and motivated to accept challenging assignments and responsibilities.
- ARE-OB3 Demonstrate successful career growth.

ARE Outcomes

The Architectural Engineering department regularly evaluates the following student skills. Specifically, every University of Wyoming Architectural Engineering graduate shall have:

1. an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
2. an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
3. an ability to communicate effectively with a range of audiences
4. an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
5. an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
6. an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
7. an ability to acquire and apply new knowledge as needed, using appropriate learning strategies

Architectural Engineering Curriculum

ARE 1000: VISTA Studio I.....	1
ARE 2000: Vista Studio II.....	3
ARE 3000: Vista Studio III.....	3
ARE 1600: Architectural Design Studio I....	3
ARE 2410: Fundamentals of Building Performance	3
ARE 2600: Architectural Design Studio II..	3
ARE 3200: Structural Analysis I.....	3
ARE 3210: Civil Engineering Materials.....	4
ARE 3300: Building Electrical and Plumbing Systems.....	3
ARE 3400: Heating, Ventilating and Air Conditioning of Buildings	3
ARE 3600: Architectural Design Studio III	3
ARE 4600: Architectural Design Studio IV	3
ARE 4740 or ARE 4720: Capstone Design..	3

ARE Major Elective: 2 courses.....	6
ART 3030: History of Architecture	3
CHEM 1020: Chemistry	4
ES 2110: Statics	3
ES 2120: Dynamics	3
ES 2310: Thermodynamics.....	3
ES 2330: Fluid Dynamics	3
ES 2410: Mechanics of Materials.....	3
GEOL 1100, 1500, or 1600.....	4
MATH 2200: Calculus I.....	4
MATH 2205: Calculus II.....	4
MATH 2210: Calculus III.....	4
MATH 2310: Applied Differential Equations I	3
Math/Science Elective.....	3
PHYS 1210 or 1220: Eng Physics I or II.....	4
STAT 2050: Statistics.....	4

Minimum credit hours required: 126.

Approved Electives

Option Electives: must take six

Third Junior Elective (3)

Structural Courses

ARE 4200, ARE 4250, ARE 4260, ARE 4285/5285, ARE 4295/ARE 5295, CE 3600, CE 4610/5610, CE 4620, CE 4630/5630, CE 4820, CE 5010, CE 5200, CE 5220, CE 5255, CE 5270

Mechanical Courses

ARE 3360, ARE 4330, ARE 4390, ARE 4430, ARE 4490, ME 3040, ME 3170, ME/ESE 4460, ME/ESE 4470

Major Electives: must take two

Any additional Option Elective from the list above, AMST 4900, AMST 5400, ARE 4050, ARE 4400, ARE 4920, ARE 5600, ARE 5700, CE 2070, CE 3300, CE 3400, CE 3500, CE 4965, CE 4970, CE 4975, CM 2000, CM 3100, CM 3120, ENR 4600

Mathematics/Science Electives

Mathematics Electives

MATH 2250, MATH 2300, MATH 3310, MATH 3340, MATH 3500, MATH 4230, MATH 4255, MATH 4300, MATH 4340, MATH 4400, MATH 4440, MATH 4500, MATH 5310, STAT 3050, STAT 4015, STAT 4025, STAT 4115, STAT 4155, STAT 4265

Science Electives

ASTR 2310, ATSC 2000, ATSC 2100, ATSC 4010, ATSC 4320, ATSC 4400, ATSC 4410, LIFE 1010 (Plus all Biology, Botany, and Zoology courses that have LIFE 1010 as a prerequisite), CHEM 1030, CHEM 1060 (Plus all Chemistry courses that have CHEM 1020, 1030, 1050, or 1060 as a prerequisite), ENR 1200, GEOL 1100, GEOL 1110, GEOL

1500, GEOL 1600, GEOL 2000, GEOL 3600, GEOL 4113, GEOL 4444 (Plus all Geology courses that have GEOL 1100 or 1200 as a prerequisite), MOLB 2021 (Plus all Molecular Biology courses that have MOLB 2021 as a prerequisite), PHYS 1210 Engineering Physics I (only if taken before or concurrently with ES 2120), PHYS 1220, PHYS 2310 (Plus all Physics courses that have PHYS 1210 or 1310 as a prerequisite), AECL 2010, AECL 3030, SOIL 2010, SOIL 3130, SOIL 4100, SOIL 4130

A minimum of 42 credit hours must be upper division (3000+) level.

Transfer Coursework: All Wyoming Community College equivalent courses will be evaluated for acceptance into the ARE program. For upper-division coursework, no more than two upper division courses may be transferred and applied to the ARE degree. However, ARE 4720 and ARE 4740 cannot be transferred to UW. Exceptional cases will be considered by petition to the Civil & Architectural Engineering department.

Advanced Civil and Architectural Engineering Standing

All undergraduate students in Civil and Architectural Engineering must fulfill the Gateway Requirement prior to enrolling in any upper-division (3000-5000 level) courses taught in the College of Engineering and Applied Science.

To meet the Civil and Architectural Engineering Gateway Requirement, the student must earn a minimum of 57 Quality Points from any combination of the following seven classes or their equivalent. It is not necessary to complete all seven courses to fulfill the Gateway Requirement.

Gateway Courses

CHEM 1020 - General Chemistry I
 PHYS 1210 - Engineering Physics I
 or PHYS 1220 - Engineering Physics II
 MATH 2200 - Calculus I
 MATH 2205 - Calculus II
 ES 2110 - Statics
 ES 2120 - Dynamics
 ES 2410 - Mechanics of Materials

See the advising pages on the Civil and Architectural Engineering website for more information.

Graduate Study

Graduate Programs

An advanced degree in architectural engineering is professionally and economically attractive. Advanced degrees are important for professional civil engineers in many specialized areas of civil engineering. Many consulting firms and industrial design groups require advanced knowledge gained from graduate studies. Engineers in such firms often work at the forefront of their profession. UW alumni are involved in design and construction of major projects worldwide.

An advanced degree is also required for careers in university teaching and research. A university career is highly recommended for those motivated students who are interested in becoming leaders in education and in the development of new concepts, processes and inventions.

The Department of Civil and Architectural Engineering offers programs leading to the degrees of master of science and Areas of study in the M.S. programs include: building mechanical systems engineering, environmental engineering, geotechnical engineering, structural engineering, and building energy modeling. Additional information is available from the department or from the Web page.

Students choose an area of emphasis in either, building, structural or mechanical systems and select courses from approved electives, usually beginning their elective sequence in the second semester of their junior year. Consult with the Civil and Architectural Engineering Department for current elective lists. Students are required to have a lap top computer.

Architectural engineering degree candidates must meet the academic requirements of the college and in addition must have an average GPA of 2.000 (C) in civil and architectural engineering courses attempted at this university.

MSARE Quick Start Program

The MSARE Quick Start program in Civil and Architectural Engineering (CAE) is designed to present highly qualified UW students with the opportunity to begin graduate study while they complete their bachelor of science (B.S.) degree in civil engineering or architectural engineering. These students must apply for admission to the Quick Start program no later than the second semester of their junior year.

This program allows for early planning of the graduate portion of a student's education and provides more flexibility in the number of required courses and the order in which they are taken. The more efficient and better-planned use of time should result in reduction of the time required for obtaining the master of science in architectural engineering (MSARE) degree. Students who enter the Quick Start program must accept the primary responsibility for actively planning their programs of study to assure timely completion of their coursework and research programs.

The Quick Start program contains two essential elements:

Qualified students may receive provisional admission to the civil engineering graduate program prior to completing the normal application process. This provisional admission will permit students to make their long-term educational plans earlier in their studies, thus providing enhanced opportunities for course selection and involvement in research.

Students in the program may apply up to six credit hours of 4000 or 5000-level courses toward both the B.S. and M.S. degree programs. By completing successfully up to six credit hours of graduate classes during their senior year, these students will have demonstrated their ability to do graduate-level coursework as undergraduates, easing their transition to the civil engineering graduate program.

Program Specific Degree Requirements

Master's Program

Areas of study in the master of science program include: building mechanical systems, building energy modeling, structural engineering, The master of science degree in each of these areas requires completion of 12 to 18 hours of engineering courses related to the particular program area.

Plan A (thesis)

The degree of master of science, Plan A, requires a minimum of 26 hours of coursework and a minimum of 4 hours thesis research in addition to the minimum requirements set forth in this bulletin.

Early in the program, the student must submit a program of study listing coursework for approval by the departmental graduate studies committee (AREGS), and the department head.

Plan A is required of all state or contract supported graduate assistants.

Plan B (non-thesis)

Requires a minimum of 30 hours of coursework and a Plan B paper, in addition to the minimum requirements set forth in this bulletin.

Early in the program, the student must submit a program of study listing coursework and the course number that the Plan B paper covers for approval by the AREGS and the department head.

Architectural Engineering (ARE)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1000. VISTA Studio I. 1. Introduction to civil and architectural engineering professions through exploration of modern engineering challenges. Students work on a design project, starting with problem definition and working towards concept designs using spreadsheet and communication tools. Professional topics introduced include globaliztion, diversity, professional ethics, design limitations and constraints, sustainability, environmental stewardship, and engineering economics. Cross listed with CE 1000. *Prerequisites:* Corequisites of MATH 1450 or MATH 1405.

1600 [2100]. Architectural Design Studio I. 3. Freshman-level architectural design in a project-based learning environment. Introduction to Building Information Modeling (BIM); architectural presentation drawings; freehand sketching; essentials of architectural design and building code compliance.

2000. VISTA Studio II. 3. Students work on a real-world project throughout the semester. Professional topics introduced include project management, engineering economic analysis methods, project estimating, professional ethics, engineering business practices common to the civil and architectural engineering professions, and professional leadership. Cross listed with CE 2000. *Prerequisites:* Corequisites: ARE 1600 or CE 1010 and MATH 2205.

2410. Fundamentals of Building Performance. 3. Introduction to building performance measures that embrace a global notion of environmental stewardship. Emphasis on passive heating and cooling systems and daylighting strategies to manage the thermal and luminous environments over the facility life cycle. *Prerequisite:* PHYS 1210.

2600 [2200]. Architectural Design Studio II. 3. Sophomore-level architectural design in a project-based learning environment using

Building Information Modeling (BIM). The course builds upon skills learned in ARE 1600, with a new emphasis on building materials and constructions methods. *Prerequisite:* ARE 1600.

3000. VISTA Studio III. 3. Students will apply professional skills such as project management, engineering economics, professional ethics, and sustainability to an integrated design project. The role of permitting, regulations, and professional codes to design problems will also be explored. Cross listed with CE 3000. *Prerequisites:* ARE 2000 or CE 2000, and ES 2410.

3030. History of Architecture. 3. [CH,G◀▶H] A survey of the history of architecture and its allied fields, focusing on the formal, aesthetic, cultural and socio-political dimensions, from prehistory to the present. Cross listed with ART 3030. *Prerequisite:* WA or COM1.

3200. Structural Analysis I. 3. Introductory design and analysis topics in stress and displacement analysis of structures, including beams, trusses and frames, classical flexibility and stiffness methods. Cross listed with CE 3200. *Prerequisite:* ES 2410.

3210. Civil Engineering Materials. 4. [WB◀▶COM3] Laboratory investigation and design of materials used in civil engineering: metals, masonry, concrete and timber. Non-destructive evaluation of materials. Analysis and presentation of data, including various types of written reports and oral presentations. Cross listed with CE 3210. *Prerequisites:* COM2 and ES 2410.

3300. Building Electrical and Plumbing Systems. 3. Introduction to National Electrical Code. The topics include basic circuits, AC and DC single phase, three phase power, transients, capacitance and inductance, branch circuits. Study of plumbing systems and fixtures including wastewater, water supply, storm water, and venting systems. Study of International Plumbing Code. *Prerequisites:* ARE 1600 or CE 1010, and ES 2330 or concurrent enrollment.

3360 [3430, 4420]. Fundamentals of Transport Phenomena. 3. Basic concepts of heat and mass transfer and their applications to problems involving engineering analysis and design. Topics include steady-state and transient conduction, free and forced convection (heat and mass), radiation and heat exchangers. Cross listed with ESE/ME 3360. *Prerequisites:* MATH 2310, ES 2310 and ES 2330.

3400 [3800]. Heating, Ventilating and Air Conditioning of Buildings. 3. Qualitative and quantitative study in concepts of basic air-conditioning with focus on buildings

including building envelope, moist air thermodynamics, human comfort, thermal load calculations, thermal behavior of buildings, HVAC systems/equipment, and design of space air-conditioning and its relationship to architectural design. Cross listed with ME 3400. *Prerequisites:* ES 2310, ARE 2410 or ME 3360, ES 2330 or concurrent enrollment.

3600. Architectural Design Studio III. 3. Junior-level architectural design in a project-based learning environment using Building Information Modeling (BIM). This course builds upon skills learned in ARE 2600, with a new emphasis on the complexities that accompany mid-rise construction, and the integration of structural and mechanical systems. *Prerequisites:* ARE 2410 and ARE 2600.

3890. Engineering Honors Program Research Methods. 3. A general approach to scientific research and graduate school preparation. Topics will include: finding a research mentor, literature search skills, using the scientific method for approaching a research problem and developing a research methodology, writing a research funding proposal, delivering a research presentation and selecting and applying for graduate school. Restricted to College of Engineering Honors Program students. Cross listed with ATSC/CE/CHE/COSC/EE/ES/PETE 3890. *Prerequisite:* sophomore standing.

4040. Historic Preservation and Sustainability. 3. Explores the historic preservation and sustainability movements and contemporary practices in these inter-related fields. Through reading, lectures, discussions and site visits, students will study how the historic preservation and the building industry professions can address advanced issues in sustainability related to the environment, culture and economics. Cross listed with AMST 4040. *Prerequisites:* 6 hours in AMST or ARE.

4050. Modern Engineering Practice. 3. Study of current professional practices in Architectural Engineering. Students will learn about leading-edge practices through guest speakers, office visits, site visits and research projects focusing on modern building innovation. May be offered as Study Abroad in London, Paris, and Barcelona, or on-campus. *Prerequisite:* ARE 2000.

4200. Structural Analysis II. 3. Stress and displacement of indeterminate structures. Determination of loads on buildings. Matrix stiffness methods. Cross listed with CE 4200. *Prerequisite:* ARE/CE 3200.

4250. Structural Steel Design. 3. Design of structural components and applications utilizing steel. Cross listed with CE 4250. *Prerequisite:* ARE/CE 3200.

4260. Structural Concrete Design. 3. Design of structural components and systems using reinforced concrete. Cross listed with CE 4260.

Prerequisite: ARE/CE 3200.

4265. Prestressed Concrete Design. 3. This is a classical course on designing prestressed and precast concrete systems. Principles and behavior of prestressed concrete build the foundation for topics that included flexure, shear, and axial load, construction and fabrication, and application. The course continues with fundamental concepts taught in ARE/CE 4260. Dual listed with ARE 5265. Cross listed with CE 4265. *Prerequisite:* ARE/CE 4260.

4285 [4280]. Masonry Design. 3. Design of structural components in reinforced masonry buildings, including walls, columns, beams and connections. Particular attention is paid to current codes, specifications and analysis. Cross listed with CE 4285. Dual listed with ARE 5285 and CE 5285. Offered on a three semester rotation. *Prerequisites:* ARE/CE 4260 and ARE/CE 3200.

4295 [4290]. Structural Timber Design. 3. Design of structural components and systems utilizing timber. Cross listed with CE 4295. Dual listed with ARE 5295. *Prerequisite:* CE 3200 or equivalent.

4330. Building Electrical Systems. 3. Analysis and design of electrical systems in buildings using the National Electrical Code. The topics include panel boards, motors, system sizing, electrical distribution in buildings, methodology of reducing the available short circuit current, transformers, capacitors in buildings, and power systems harmonics. Students will perform an electrical building design project. *Prerequisites:* ARE 3300.

4390. Building Safety and Fire Protection. 3. Fundamentals of building design for fire and life safety. Emphasis is on a systematic design approach. Basic considerations of building codes, fire loading, fire resistance, means of egress design, introduction to protective systems including fire protection systems, and fundamentals of fire and smoke control. *Prerequisites:* ARE 3300.

4430 [3420, 4810]. HVAC Systems Analysis and Design. 3. Engineering design and performance analysis procedures for commercial building mechanical systems including energy conservation techniques. Relationship to aesthetic, architectural and structural elements are considered. Cross listed with ME 4430. *Prerequisites:* Completion of the ME Success Curriculum, ARE 3400 and ARE/ME 3360 or concurrent. (Normally offered alternate spring semesters)

4490. Modeling and Optimization of Energy Systems. 3. Application of principles of thermodynamics, fluids, and heat and mass transfer in the component and system-level design of energy/thermal systems, including modeling, simulation and optimization techniques. Examples are drawn from building environmental control, energy conversion and thermal industrial processes. Students work on projects for integration of these components in the design of energy/thermal systems. Requires enrollment in associated laboratory session. Cross listed with ME 4490. *Prerequisite:* ARE 3400.

4600. Architectural Design Studio IV. 3. Senior-level architectural design in a project-based learning environment using Building Information Modeling (BIM). The course builds upon skills learned in ARE 3600, with a new emphasis on the complexities that accompany high-rise construction, and the integration of structural and mechanical systems. *Prerequisite:* ARE 3600.

4720. Structural Systems Design Project. 3. Final course in the building structural systems sequence incorporating elements of previous design courses by executing design of a hypothetical building with a concentration on a detailed design of the project's structural systems. *Prerequisites:* ARE 4200, ARE 4250, and ARE 4260 or concurrent enrollment.

4740. Mechanical Systems Design Project. 3. Final course in the building mechanical systems sequence incorporating elements of previous design courses by executing design of a hypothetical building with a concentration on a detailed design of the project's mechanical systems. *Prerequisites:* ARE 3400 and concurrent enrollment in ARE 4430 or ARE 4490.

4920. Senior Architectural Engineering Problems 1-3 (Max. 6). A study of current engineering design problems that are applicable to architectural engineering either on an individual basis or for small seminar type groups. Not for graduate credit. *Prerequisite:* senior standing or consent of department head.

4975. Civil and Architectural Engineering Internship. 1-3 (Max. 3). Students may apply for credit for extended work experience (>10 weeks; full-time) at a professional engineering or architectural firm, supervised by a licensed professional. Students should apply through their adviser prior to the work experience. Enrollment is by departmental approval only. Offered summer only. Cross listed with CE 4975. *Prerequisite:* consent of department head.

5265. Prestressed Concrete Design. 3. This is a classical course on designing prestressed and precast concrete systems. Principles and

behavior of prestressed concrete build the foundation for topics that included flexure, shear, and axial load, construction and fabrication, and application. The course continues with fundamental concepts taught in ARE/CE 4260. Dual listed with ARE 4265. Cross listed with CE 5265. *Prerequisite:* ARE/CE 4260.

5285. Masonry Design. 3. Design of structural components in reinforced masonry buildings, including walls, columns, beams and connections. Particular attention is paid to current codes, specifications and analysis. Cross listed with CE 5285. Dual listed with ARE 4285 and CE 4285.

5295. Structural Timber Design. 3. Design of structural components and applications utilizing timber. Cross listed with CE 5295. Dual listed with ARE 4295. *Prerequisite:* CE 3200 or equivalent.

5600. Collaborative BIM Design. 3. An advanced comprehensive building design course integrating architectural and engineering skills, where design decisions are supported by performance simulation and analysis. Students will use Building Information Modeling (BIM) software and simulate a professional Integrated Project Delivery (IPD) experience by collaborating with a practicing architect on a real-world project. *Prerequisite:* ARE 3600.

5700. Architectural Engineering Problems I. 1-3 (Max. 6). A special course, designed to make possible the study and investigation of problems or phases of architectural engineering selected to fit the needs of the students. *Prerequisite:* consent of instructor.

Construction Management

Construction Management is a rapidly-growing discipline, that is focused on the planning and oversight required to deliver construction projects on-time and on-budget. Students learn skills such as project management, decision making, budgeting, scheduling, and site logistics including safety planning, surveying, and building information modeling.

The Construction Management curriculum is designed to prepare students for success in a wide variety of career paths available in the construction sector. The curriculum includes course work in construction, business, humanities and social sciences to enrich the student's academic experience and to assist them in making a positive contribution to society. The program leads to a four-year Bachelor of Science in Construction Management degree.

Construction Management degree candidates must meet the academic requirements of the college and in addition must have an average GPA of 2.000 in courses required for the major.

A grade of C or better is required in all required courses with a CM prefix.

Construction Management Learning Objectives

Upon graduation students shall be able to:

1. Create written communications appropriate to the construction discipline.
2. Create oral presentations appropriate to the construction discipline.
3. Create a construction project safety plan.
4. Create construction project cost estimates.
5. Create construction project schedules.
6. Analyze professional decisions based on ethical principles.
7. Analyze construction documents for planning and management of construction processes.
8. Analyze methods, materials, and equipment used to construct projects.
9. Apply construction management skills as a member of a multi-disciplinary team.
10. Apply electronic-based technology to manage the construction process.
11. Apply basic surveying techniques for construction layout and control.
12. Understand different methods of project delivery and the roles and responsibilities of all constituencies involved in the design and construction process.
13. Understand construction risk management.
14. Understand construction accounting and cost control.
15. Understand construction quality assurance and control.
16. Understand construction project control processes.
17. Understand the legal implications of contract, common, and regulatory law to manage a construction project.
18. Understand the basic principles of sustainable construction.
19. Understand the basic principles of structural behavior.
20. Understand the basic principles of mechanical, electrical and piping system.

Construction Management Curriculum

ACCT 2010: Accounting 1.....	3
CE 1000: Vista Studio I.....	1
CE 2070: Engineering Surveying.....	3
CM 2000. Introduction to Construction Management.....	3
CM 2120. Construction Materials and Methods	3
CM 2300: Construction Safety.....	3
CM 2400: Mechanical, Electrical, and Plumbing	3
CM 2600. Construction Documents	3
CM 3100: Construction Scheduling.....	3
CM 3XXX: Construction Law & Contract..	3
CM 3XXX: Structural Systems.....	4
CM 3XXX: TBD.....	3
CM 3120: Cost Estimating	3
CM 3XXX: Soils and Concrete	3
CM 4XXX: Project Management.....	3
CM 4XXX: Heavy CM Methods.....	3
CM 4XXX: Building Info. Modeling	3
CM 4XXX: Capstone Project.....	3
CM Elective: 2 courses.....	6
COJO 2010: Public Speaking	3
COJO 3010: Business and Prof. Comm	3
ECON 1010: Macroeconomics	3
General Elective: 4 courses	12
GEOL 1100: Physical Geology	4
MATH 1405: Trigonometry	3
MATH 2200: Calculus I.....	4
MGT 1040: Legal Environment Business	3
MGT 3210: Management & Organization....	3
PHYS 1110: General Physics 1.....	4
STAT 2050: Fundamentals in Statistics	4

Minimum credit hours: 120

Construction Management (CM)

2000. Introduction to Construction Management. 3. Introduction to the practice and principles of construction management as it relates to both vertical and horizontal construction projects.

2120. Construction Materials and Methods. 3. Introduction to building materials and construction practices used in the construction industry to construct both vertical and horizontal construction projects. *Prerequisite:* COM1.

2300. Construction Safety. 3. Introduce students to the various causes of construction accidents and adopted strategies to prevent worksite injuries and illnesses with an emphasis on OSHA standards. *Prerequisite:* CM 2000.

2400 MEP Systems. 3. Introduction to mechanical, electrical and plumbing systems in site infrastructure and vertical construction projects. *Prerequisites:* C in PHYS 1110.

2600. Construction Documents. 3. Introduction to the creation and interpretation of construction documents used in the construction industry to build today's vertical and horizontal construction projects. *Prerequisite:* CM 2000.

3100. Construction Scheduling. 3. Principles of construction scheduling including analytical and quantitative scheduling and management techniques as they apply to both vertical and horizontal construction projects. *Prerequisite:* C in CM 3120.

3160 Construction Law & Contracts. 3. The course covers different contract methods, or arrangements, used by the Construction industry to contract and procure construction work. The course also introduces students to construction law in support of planning and the execution of construction work. *Prerequisites:* CM 2600.

3210. Construction Estimating. 3. The course introduces students to concepts in estimating including but not limited to labor and equipment calculations, the use of price databases, direct and indirect cost, bid preparation and computer applications. *Prerequisites:* C in CM 2600.

4100 Project Management. 3. This course guides students through fundamental Project Management concepts and behavioral skills needed to successfully launch and lead construction projects in the construction sector. *Prerequisite:* CM 3100.

4140 Heavy CM Methods. 3. The course provides student an overall understanding of construction equipment and selected construction methods used on large scale construction projects. With specific reference to selection, economy, and productivity of common construction equipment and construction procedures for site development and industrial, heavy and civil construction. *Prerequisites:* CM 2120 and CM 3200.

4600 Building Info. Modeling. 3. This course focuses on the skills and information needed to effectively use an existing Building Information Model (BIM) in plan execution for a building construction project. This is a projectbased course where students develop skills on the implementation of BIM concepts throughout the lifecycle of a building, from planning and design, to construction operations. *Prerequisites:* CM 2600.

4900 Capstone Project. 3. This course requires students to participate in a “real” construction situation involving all aspects of managing a project; from initial planning to completion, including budgets, estimating, scheduling, financing and creating contracts and other construction forms as necessary. Case studies will be utilized to develop critical thinking skills. *Prerequisites:* CM 4100.

4970. Construction Management Internship. 3. Students may apply for credit for extended work experience (>10 weeks; full-time) in the construction industry, supervised by a professional. Students should apply through their adviser prior to the work experience. Enrollment is by departmental approval only. Offered summer only.

Land Surveying

A minor in Land Surveying requires 31 hours of specific course work. This minor meets the Wyoming Board of Registration for Professional Engineers and Professional Land Surveyor’s surveying education requirements for eligibility as a Land Surveyor in Training. The Land Surveying minor may be paired with any major. With the exception of CE 2070, all classes are offered distance learning through Distance Education Programs.

Land Surveying Minor Curriculum Requirements:

LS	2110	.....3
CE 2070 or LS 2010 and LS 2015		.....3
LS	3130	.....3
LS	3100	.....2
LS	2400	.....2
LS	2020	.....4
ENTK	2500 ¹	.....3
LS	3200	.....3
LS	3210	.....4
LS	3120	.....2
LS	3110	.....2
	Total Hrs.	31

¹Computer Aided Drafting 1 offered through Sheridan College Outreach Programs.

Land Surveying (LS)

2010 [CE 2072]. Engineering Surveying Lecture. 2. Principles of measurements of distances, elevation and angles. Basic error theory in measurement and calculations. Basic principles of surveying and map making. *Prerequisite:* a working knowledge of algebra and trigonometry.

2015 [CE 2073]. Engineering Surveying Laboratory. 1. Field surveying activities consisting of traversing, differential leveling, construction staking and gathering topographic data. *Prerequisite:* LS 2010 or concurrent.

2020 [CE 2090]. GPS for Land Surveyors. 4. From fundamental theory to practical application and advanced technologies, this class covers all aspects of GPS needed to understand and use GPS as a land surveyor including the basics of GPS technology, common hardware, surveying methods, survey design, planning and observing, real-time kinematics and DGPS. *Prerequisites:* LS 2400.

2100 [CE 2076]. Records Research for Surveyors. 3. Introduced to the public, quasi-public, and private depositories of recorded and non-recorded documents that establish land ownership boundaries, easement boundaries, and land use rights and restrictions in both the Public Land Survey System and the Colonial States. Assignments will require work to be conducted during depositories’ normal business hours.

2110 [CE 2050]. Real Property Law. 3. Covers all major areas of real property law, including the nature of real property, types of ownership, real estate contracts, title and insurance, financing, landlord and tenant, land use, environmental law and regulation. An understanding of real property law is fundamental to understanding boundary law.

2400 [CE 2089]. Basic Geodesy for Today’s Land Surveyor. 2. The history of geodesy including measurement techniques, coordinate systems, ellipsoids, and datums is reviewed. The modern geodetic and Cartesian coordinates systems, as well as the differences between grid and ground coordinates systems, and the current geodetic and Cartesian coordinate systems available today are discussed. *Prerequisite:* CE 2070 or LS 2010.

2410 [CE 2083]. GIS in Surveying. 3. Covers the basic concepts of geographic information systems, the methods and software used to implement them, and their applications to surveying and analysis of other surveying problems. *Prerequisites:* CE 2070 or LS 2010, and ES 1060 or ES 1061.

2499. Sophomore Land Surveying Topics. 1-6 (Max. 6). A study of current sophomore land surveying problems that are applicable to land surveying for small group classes. *Prerequisite:* Approval of the Land Surveying Program director.

3100 [CE 2088]. Real Property Descriptions. 2. Historical and current issues for land description writing and usage for the practicing surveyor. Relationship between written

descriptions and field survey data, interpreting old descriptions and the structure principles of description. *Prerequisites:* CE 2070 or LS 2010, and LS 2100 and LS 2110.

3110 [CE 3750]. Boundary Evidence. 2. A practical and working guide to understanding survey evidence and the laws of boundary location for efficient, accurate boundary determination. This material aids in the elimination of errors in location of land boundaries. The surveyor’s liability and statutes of limitations are explored in depth. Also included are discussions of the surveyor’s role in court. Normally offered only through the Outreach School. *Prerequisites:* CE 2070 or LS 2010, and LS 2110.

3120 [CE 3740]. Boundary Principles. 2. This course in boundary law addresses the fundamental principles of real property as applied to land surveying and related professions. Discussion and applications center on practical situations and concepts commonly encountered while conducting boundary surveys and the determination of the extent of ownership rights. Students explore the scope of the surveyors’ judiciary role in real property ownership. Primarily offered through the Outreach School. *Prerequisites:* CE 2070 or LS 2010, and LS 3100 and LS 2110.

3130 [CE 2085]. Public Land Surveys. 3. Basic fundamentals of the Public Land Survey System (PLSS), dependent and independent resurveys, survey plats, “bona fide rights”, riparian boundaries, non-rectangular entities, corner evidence and the role of the modern day surveyor. *Prerequisites:* CE 2070 or LS 2010, and LS 2110.

3200 [CE 3710, CE 4710]. Route Surveying. 3. Laying out of super elevation and circular, parabolic, and spiral curves; the difference between highway and railway horizontal curve geometry; offsets to spiral curves as boundaries; area and volumes of earthwork. *Prerequisites:* CE 2070 or LS 2010, and ES 1060 or ES 1061.

3210 [CE 3720, CE 4720]. Advanced Surveying. 4. Advanced topics in surveying computations and procedures, including traverse error analysis, topographic surveying, mapping, astronomical observations, coordinate geometry applications, and state plane coordinates. *Prerequisite:* CE 2070 or LS 2010.

3230 [CE 3760]. Applied Least Squares Adjustments. 4. The use of applied statistics in land surveying, error propagation in polygon and link traverses, discussion of positional tolerances and an introduction to least squares adjustments using StarNet and VectorNT software. *Prerequisite:* CE 3720 or LS 3210.

3300 [CE 2074]. Ethics for the Professional Surveyor. 1. Introduction to the common ethical and moral issues facing professional surveyors in modern practice. *Prerequisite:* One of LS 3110, LS 3120 or LS 3130.

3400 [CE 4750]. Remote Sensing/Photogrammetry for Surveyors. 3. Procedures and methods used for deriving metric information from photographs, analog processes for using aerial photographs in production of topographic maps, flight planning, and cost estimation in aerial mapping work. Introduction to photocoordinate measurement devices and their calibration. Mathematics of modern photogrammetry. *Prerequisite:* CE 2070 or LS 2010.

3500. Junior Surveying Topics. 1-6 (Max. 6). A study of current junior landsurveying problems that are applicable to land surveying for small group classes. *Prerequisite:* Approval of the Land Surveying Program director.

4110 [CE 4700]. Coastal Water Boundaries. 3. The physical and legal issues involved with property rights of lands abutting tidal waters, a review of the Public Land Survey System, the Submerged Lands Act and the Swamp and Overflowed Lands Act. Includes case law research. *Prerequisites:* LS 3110, LS 3120.

4120 [CE 4730]. Inland Water Boundaries. 3. Introduces the physical and legal issues involved in locating property rights associated with lands that abut non-tidal, navigable and non-navigable rivers and lakes. The property rights which attach to, as well as the limitations placed on these riparian parcels will be examined and discussed with respect to statutory, administrative and case law. *Prerequisite:* LS 4110.

4130 [CE 2086, CE 4740]. Advanced Public Land Surveys. 4. Advanced topics in situations and problems in the Public Land Survey system, with discussion of major court cases involving everyday applications to surveyors. 1975 BLM casebook and other sources of survey reference. *Prerequisites:* LS 3120 and LS 3130.

4500. Senior Land Surveying Topics. 1-6 (Max. 6). A study of current senior land surveying problems that are applicable to land surveying for small group classes. *Prerequisite:* Approval of the Land Surveying Program director.

Department of Computer Science

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Department Head: **Ruben Gamboa**

Professors:

JAMES L. CALDWELL, B.S. State University of New York at Albany 1984; M.S. 1988; M.S. Cornell University 1995; Ph.D. 1998; Professor of Computer Science 2015, 1998.

RUBEN GAMBOA, B.S. Angelo State University 1984; M.S. Texas A&M University 1986; Ph.D. The University of Texas 1999; Professor of Computer Science 2015, 2002.

JOHN M. HITCHCOCK, B.S. Iowa State University 1999; M.S. 2001; Ph.D. 2003; Professor of Computer Science 2015, 2003.

Associate Professor:

AMY BANIC, B.S. Duquesne University 2003; M.S. University of North Carolina 2005; Ph.D. 2008; Assistant Professor of Computer Science 2012, 2010.

Assistant Professors:

MIKE BOROWCZAK, B.S. University of Cincinnati 2007; Ph.D. 2013; Assistant Professor of Computer Science 2018.

DIKSHA SHUKLA, B.S. Kanpur University 2008; M.C.A. Jawaharlal Nehru University 2011; M.S. Louisiana Tech University 2014; Ph.D. Syracuse University 2019; Assistant Professor of Computer Science 2019.

LARS KOTTHOFF, Diplom (M.Sc.) University of Leipzig 2007; Ph.D. University of St. Andrews 2012; Assistant Professor of Computer Science 2017.

CHAO LAN, B.Eng. Nanjing University of Posts and Telecommunications 2008; M.Eng. 2011; Ph.D. University of Kansas 2017; Assistant Professor of Computer Science 2017.

Senior Lecturer:

ALLYSON A. ANDERSON, B.S. University of Wyoming 1991; M.S. 1994; Senior Lecturer of Computer Science 2008, 1994.

JAMES S. WARD, B.S. University of Wyoming 1993; M.S. 1997; Senior Lecturer of Computer Science 2011, 2000.

Associate Lecturer:

KIM BUCKNER, B.S. Chapman University 1993; M.S. University of Tennessee, Knoxville 1998; Ph.D. 2003; Associate Lecturer of Computer Science 2014, 2008.

Professor Emeritus:

Thomas A. Bailey, Jr., Henry R. Bauer III,
John R. Cowles, John Rowland

Lecturer Emeritus:

Jeri R. Hanly

A Bachelor of Science degree (B.S.) in Computer Science prepares students for careers in virtually any industry or to continue on with graduate study in Computer Science and many other fields. Computer science students learn to approach problems from a computational (algorithmic) point of view, and this approach to problem solving often leads to better and more general solutions. Software systems, information technology, and large scale data applications are core technologies in every area and the applications continue to grow with software and information systems becoming more and more embedded in the fabric of everyday life. These systems are essential tools in science and engineering, for business and finance, government, communications, medicine, and entertainment. Software systems make the world go round and smart devices, such as phones, tablets, glasses, wearable devices, medical implants are ubiquitous. As a result, computer science has grown from a specialized field to an independent, broadly based area that studies all aspects of the use and understanding of software systems, information, and computational processes. Students studying B.S. in Computer Science at the University of Wyoming can study for the B.S. degree in Computer Science and have the option to focus their studies by taking a concentration in Business, Big Data, or the Cybersecurity certificate. The Cybersecurity certificate captures core technical cyber security foundations and principles, from databases and networks to advanced threat detection and mitigation. All of the Computer Science concentrations lead to a Bachelor of Science in Computer Science and all programs are ABET accredited.

Program Objectives

The following are the objectives that the Computer Science program is preparing its graduates to achieve:

Success: Graduates will be employed in a computer science-related field or making progress toward an advanced graduate degree.

Growing: Graduates show continued learning and leading in computing-related professions.

Ethics: Graduates exhibit ethical and responsible behavior in all professional and community endeavors.

Program Learning Outcomes

The program of study in Computer Science enables students to achieve, by the time of graduation:

1. Analyze a complex computing problem and to apply principles of computing and other relevant disciplines to identify solutions.
2. Design, implement, and evaluate a computing-based solution to meet a given set of computing requirements in the context of the program’s discipline.
3. Communicate effectively in a variety of professional contexts.
4. Recognize professional responsibilities and make informed judgments in computing practice based on legal and ethical principles.
5. Function effectively as a member or leader of a team engaged in activities appropriate to the program’s discipline.
6. Apply computer science theory and software development fundamentals to produce computing-based solutions.

Computer Science Undergraduate Major

This major consists of a core set of required and elective courses as seen below. Students may also pursue one of a number of concentrations, which may further constrain the elective courses: Computers and Business, or Big Data. In addition to these courses, Computer Science majors must satisfactorily meet the requirements of the University Studies Program (USP), and they must complete a minimum of 120 credit hours, at least 42 of which must be upper division hours. See the front sections of this catalog for specifics on the USP and university graduation requirements. Note that some of the courses required for the Computer Science core or the concentrations will meet some of the USP requirements. Students do not have to take additional courses to meet those requirements. All courses in Computer Science, Mathematics, and Statistics must be completed with a grade of C or better. A grade of C- is not acceptable.

Computer Science Core

These courses, along with the USP requirements, provide a basic set of skills that all Computer Science majors should master. The courses in this program concentrate on the cre-

ation and understanding of computer software. The curriculum focuses first on programming and then on the central processes that support programming: operating systems, programming languages, and computational theory.

Computer Science Core (required for all concentrations) Hrs.

Computer Science courses	
COSC 1010: Intro to Computer Science	4
COSC 1030: Programming I	4
COSC 2030: Programming II	4
COSC 2150: Computer Organization.....	3
COSC 3011: Software Design	3
COSC 3015: Functional Programming	3
COSC 3020: Algorithms & Data Structures	4
COSC 3050: Ethics in Computer Professional	1
COSC 4950: Senior Design I.....	1
COSC 4955: Senior Design II	2
Operating Systems Course.....	4
Choose one of: COSC 3750: Linux Programming for System Applications (see NOTE below) or COSC 4740: Operating Systems Design	
Systems Course	3
Choose one of: COSC 4760: Computer Networks or COSC 4820: Database Systems	
Program Language Course	3
Choose one of: COSC 4780: Principles of Programming Languages or COSC 4785: Compiler Construction	
Theory Course	3
Choose one of: COSC 4100: Foundations of Computing or COSC 4200: Computability & Complexity	
Mathematics and Science courses:	
MATH 2200: Calculus I.....	4
MATH 2205: Calculus II.....	4
MATH 2250: Linear Algebra.....	3
COSC/MATH 2300: Discrete Structures.....	3
Statistics Course:	
one of STAT 2050 or 2070	4
Science Courses: must take two, 4 hour science courses outside of Computer Science. See NOTE below.....	8
Math/Science electives: Elective or electives needed to meet ABET minimum Math/Science requirement of 30 credit hours. See NOTE below for courses meeting the math or science elective.....	4

NOTE: If COSC 3750 is taken for the Operating Systems Course. Student must still meet the minimum total coursework requirement for the degree.

NOTE: Math/Stat electives means any MATH courses above Calculus II or STAT courses 3000 and up. Exceptions: cannot count MATH 2350, MATH 2355, MATH 4000, STAT 4220 or any variable credit courses toward this requirement.

NOTE: Courses meeting the Science requirement must have a lab component and be for science or engineering majors. See Department web pages for a current list of other approved courses.

Computer Science Major

Degree Requirement in addition to completion of the core and USP requirement include four COSC Electives and five General Electives.

Computer Science Computer Science courses: (see NOTE below) Hrs.

COSC Elective #1.....	3
COSC Elective #2.....	3
COSC Elective #3.....	3
COSC Elective #4.....	3

General Electives: (see NOTE below)

General Elective #1	3
General Elective #2	3
General Elective #3	3
General Elective #4	3
General Elective #5	3

NOTE: COSC electives: include any COSC 3000+ course which is not used to complete any other requirement. Note: a total of 3 credits of COSC 3970 can be used.

NOTE: General electives include any course at or above the 1000 level. They can be used to reach minimum number of upper division hours required for graduation. MATH courses above Calculus II or STAT courses 3000 and up. Exceptions: cannot count MATH 2350, MATH 2355, MATH 4000, or any variable credit courses toward this requirement. Electives need to be selected that will meet the 42 hour requirement for Upper Division credits.

Computers and Business Concentration

An understanding of business fundamentals is essential for students planning a career in applied computer science in a business environment. Students who wish to pursue a Computers and Business concentration are required to complete one of the minors offered by the College of Business. Students should take COSC 4820 to satisfy the system course requirement. In addition, students should take the following courses as part of the Computer and Business Concentration:

Computers and Business Computer Science courses: Hrs.

(see NOTE below)	
COSC 4210: Analysis and Design	3
COSC 4220: Design and Implementation	3

COSC Elective #1.....	3
COSC Elective #2.....	3
College of Business Minor (see NOTE below)	
Business Minor #1.....	3
Business Minor #2.....	3
Business Minor #3.....	3
Business Minor #4.....	3
Business Minor #5.....	3
NOTE: COSC electives: include any COSC 3000+ course which is not used to complete any other requirement. Note: a total of 3 credits of COSC 3970 can be used. NOTE: Minimum Coursework Hours: A minimum of 120 hour is required. However, some Business Minors may require additional coursework in excess of 120 hours, dependent upon the minor selected by the student.	

Big Data Concentration

Big data is high volume, high velocity, and/or high variety assets that require new forms of processing to enable enhanced decision making, insight discovery and process optimization. The Big Data Concentration directs the students toward data handling (AI, visualization, data mining, and machine learning) courses and data analysis (statistics) courses.

Students who wish to pursue the Big Data concentration should take the following courses to fulfill the Big Data Concentration in addition to the COSC core and USP requirements. In addition, students who wish to pursue a Big Data concentration are required to minor in Statistics.

Big Data	Hrs.
Computer Science courses	
COSC 4450: Graphics.....	3
COSC 4550: Intro to Artificial Intelligence...3	
COSC 4555: Machine Learning.....	3
COSC 4570: Data Mining.....	3
General Elective (see NOTE below).....	3
Stat Minor Elective #1.....	3
Stat Minor Elective #2.....	3
Stat Minor Elective #3.....	3

NOTE: General electives include any course at or above the 1000 level. They can be used to reach minimum number of upper division hours required for graduation. MATH courses above Calculus II or STAT courses 3000 and up. Exceptions: cannot count MATH 2350, MATH 2355, MATH 4000, or any variable credit courses toward this requirement. Electives need to be selected that will meet the 42 hour requirement for Upper Division credits.

Cybersecurity Certificate

Cybersecurity is the practice of ensuring the confidentiality, integrity, and availability of information within interconnected systems. Cybersecurity requires extending the typical design and trade-off space to include

protection and resiliency to combat malicious actors. Thinking like an adversary becomes a core competency of students in the program, and enables certificate graduates to approach the design and (re)development of systems from a more strategic security-centric mindset. The Cybersecurity Certificate guides students through foundational computer science and statistics concepts necessary for analyzing threat potentials and attack surfaces, building on those with competencies in critical system infrastructure through databases and networks, and further specialized them through two cybersecurity intensive courses.

Cybersecurity Certificate	Hrs.
COSC 2030: Computer Science II.....	4
COSC 4010: Cyber Security Topics Course..3	
COSC 4760: Computer Networks.....	3
COSC 4765: Computer Security.....	3
COSC 4820: Database Systems.....	3
STAT 2010, 2050, 2070, or 4220.....	4

Minimum Required 20

Note: COSC 4760 can also be replaced by the ECE version ECE 4870 or a second COSC 4010: Cyber Security Topics Course.

Computer Science Minor Requirements

Requirements for a minor in Computer Science are as follows:

A total of 18 credits of computer science courses

All 18 credits must have a grade of C or better. A grade of C- is not acceptable.

Graduate Study

The Department of Computer Science offers graduate work leading to the Master of Science degree in computer science and the Doctor of Philosophy in computer science. The Department also offers a graduate minor in computer science.

Program Specific Admission Requirement

Applicants for a graduate degree in computer science are expected to have completed undergraduate courses in Algorithms and Data Structures (COSC 3020 equivalent), Theory of Computing (COSC 4100 or 4200 equivalent), Operating Systems (COSC 4740 equivalent), and Programming languages or Compilers (COSC 4780 or 4785 equivalent). Applicants to the doctoral program must have completed a bachelor's degree in computer science or a closely related discipline at an accredited university or college.

The Graduate Record Examination (GRE) is required of all applicants. GRE scores are required with minimums of 40th percentile for the verbal score and 65th percentile for the quantitative score. Our strongest students tend to have scores substantially above these minimums, with quantitative scores often around the 90th percentile or higher.

Students whose native language is not English must also complete the Test of English as a Foreign Language (TOEFL) with a score of at least 550 on the paper based TOEFL; 213 on the computerized test including a 58 or better in section 1-Reading; 80 for the Internet based TOEFL (iBT) including a score of 23 or better in section 1-Reading or the International English Language Testing System (IELTS) test with a 6.5 score or better.

You must submit to the online application system contact information for three references that can evaluate your potential for graduate study in computer science. If you wish to pursue a Ph.D., the letters should address your ability to pursue quality original research. Letters should also evaluate your oral and written communication skills.

If you meet the minimum criteria and would like to formally apply for admission you will also need to submit the following information during the completion of your application via the application portal:

Copies of transcripts from all colleges and universities (minimum GPA or equivalent 3.000 on a scale of 4.000) for all degrees attained. International applicants must submit copies of individual semester transcripts, consolidated transcripts will not be accepted.

Copy of GRE scores a minimum percentile of 40% on verbal and 65% on quantitative portions of the exam. The majority of admitted students tend to have scores substantially above these minimums.

Contact information for three recommendation letters (applicants should follow-up with recommenders to ensure this requirement is fulfilled; applications will not be processed further until all recommendations have been received).

International students will also need to submit a copy of TOEFL scores, or IELTS scores.

High performing undergraduates in computer science can elect for Quick Start admission to the graduate program, allowing the sharing of up to six credit hours of 5000-level coursework toward the completion of both the B.S. and the graduate degree programs.

Program Specific Degree Requirements

M.S. Program

Each M.S. student will have a supervising committee of at least three members appointed. The committee will consist of at least two members of the computer science faculty and at least one non-COSC faculty member.

Plan A (thesis)

A total of at least 31 credit hours must be completed. The student must complete a minimum of 27 hours of courses, including the CORE and BREADTH REQUIREMENTS. At least 19 credit hours must be COSC courses. All COSC courses must be at the 5000 level. Courses from other departments, including no more than 6 hours of 4000-level courses, may be included with the approval of the supervising M.S. committee.

Plan A students are required to formally defend their theses before their supervising committees. All defenses must be open and announced at least two weeks in advance. The thesis must be distributed to the committee at least two weeks in advance of the defense. If the student does not pass the defense, the committee will instruct the student as to what needs to be accomplished (and by when) to pass.

Plan B (non-thesis)

The student must complete a minimum of 33 hours of courses, including the CORE and BREADTH REQUIREMENTS. At least 22 credit hours must be COSC courses. All COSC courses must be at the 5000 level. Courses from other departments, including no more than 6 hours of 4000-level courses, may be included with the approval of the supervising M.S. committee.

UW Coursework Requirements for M.S. Transfer Students: M.S. transfer students must complete at least 21 credit hours at the University of Wyoming. At least 12 credits of the CORE & BREADTH REQUIREMENTS must be taken at the University of Wyoming. No more than one class per category of breadth may be counted towards this 12-credit total. The algorithms course credits may be counted toward this 12-credit total.

Summary of Credit Requirements

Plan A

Core: COSC 5110.....	3
Breadth: theory course, AI course, two systems courses.....	12
Additional courses.....	12
Thesis/Dissertation (COSC 5960/5980).....	4
Total Hrs.	31

Plan B

Core: COSC 5110.....	3
Breadth: theory course, AI course, two systems courses.....	12
Additional courses.....	18
Total Hrs.	33

Ph.D.

Core: COSC 5110.....	3
Breadth: theory course, AI course, two systems courses.....	12
Additional courses.....	27
Thesis/Dissertation (COSC 5960/5980)....	12
Other credits (may include courses or COSC 5960/5980)	18
Total Hrs.	72

Ph.D. Program

Each doctoral student will have a supervising committee of at least five members appointed. The primary functions of this committee are to suggest coursework, to administer the qualifying, preliminary, and final examinations, and to oversee and evaluate the research of the candidate. The committee will consist of at least three members of the computer science department faculty and at least one non-COSC faculty member. The standards that this committee should consider when recommending programs of study are outlined in the following sections.

Coursework Requirements: A total of at least 72 credit hours must be completed. A minimum of 42 of these credit hours must be taken as coursework, including the CORE and BREADTH REQUIREMENTS. A minimum of 12 hours of COSC 5980 (Dissertation Research) must be taken. All COSC courses must be at the 5000 level. Courses from other departments, including no more than 12 hours of 4000-level courses, may be included with the approval of the supervising Ph.D. committee. All course requirements MUST be completed or enrolled with satisfactory midterm progress prior to scheduling the Ph.D. Final Examination.

UW Coursework Requirements for Ph.D. Transfer Students: Ph.D. transfer students must complete at least 24 credit hours at the University of Wyoming. At least 12 credits of the CORE

and BREADTH REQUIREMENTS must be taken at the University of Wyoming. No more than one class per category of breadth may be counted towards this 12-credit total. The algorithms course credits may be counted toward this 12-credit total.

Program: A program of original and innovative research will be undertaken by the candidate. At the end of this program, the candidate will document this research in a dissertation. The dissertation will present the details and results of the candidate's research in addition to providing a critical comparison with relevant previously-published works.

Each successful doctoral student must pass three examinations. These include a qualifying examination, a preliminary examination, and a final (dissertation) defense.

Qualifying Exam Criteria: The student must complete the CORE REQUIREMENT and pass a closed oral examination on a research area administered by the supervising committee. Although closed to the public, faculty members of the Department of Computer Science are welcome to attend. The exam must be announced to the faculty at least two weeks in advance. The research area will be chosen in consultation with the committee. The student must demonstrate background knowledge of the state of the art in the area and preliminary work. This will involve, but is not limited to, presenting material and answering questions covering the relevant area knowledge. The format of the exam will be defined by the committee prior to the exam to allow for sufficient preparation. This examination is intended to motivate the candidate to review relevant literature extensively prior to pursuing the original and innovative portions of the research. Qualifying exam criteria must be completed within the first two years of enrollment in the Ph.D program. If the student does not pass the qualifying exam, the committee will instruct the student as to what needs to be accomplished (and by when) to pass. The closed oral examination requirement may be waived for a student who has completed an M.S. degree in COSC at UW if their M.S. presentation was at a research level that demonstrated background knowledge of the state of the art in the area, at the discretion of the supervising Ph.D. committee.

Preliminary Exam Criteria: Prior to scheduling the Preliminary Examination, the student must be making satisfactory progress towards completion of their course requirements, including the BREADTH REQUIREMENTS. A Preliminary Examination will consist of

a presentation and defense of the already-completed portion of the dissertation research and the research that is proposed to complete the dissertation. The Preliminary Examination must be open and announced at least two weeks in advance. The preliminary examination must be completed within two years of enrollment in the Ph.D. program (within three years of enrollment for students who do not have an M.S. degree). This examination is intended to motivate the candidate to make significant progress on work towards their Ph.D. dissertation and propose milestones for completion. If the nature of the proposed continued research and methodology is deemed to be sufficiently original and innovative by the supervising committee, then the committee will approve the research direction after having administered this examination. If the student does not pass the preliminary exam, the committee will instruct the student as to what needs to be accomplished (and by when) to pass.

Option for M.S. degree en route to Ph.D.: After completing the Qualifying Exam and Preliminary Exam, a Ph.D. student may additionally earn an M.S. degree after completing the remaining M.S. course requirements, including the BREADTH REQUIREMENTS. COSC 5980 may be substituted for COSC 5960 in the M.S. requirements at the discretion of the supervising committee. The M.S. degree will be granted only after completion of the preliminary exam. For an M.S. degree to be granted prior to completion of the preliminary exam, the student should enroll in the M.S. degree program and complete the remaining M.S. requirements.

Final Exam Criteria: Prior to scheduling the Ph.D. Final Examination (often referred to as a “defense”), all course requirements, including the BREADTH REQUIREMENTS, MUST be completed or enrolled with satisfactory midterm progress. The Final Examination (dissertation defense) will consist of an oral presentation by the candidate of his/her research and the results that were derived. At this examination, the candidate is expected to defend the research as being original and contributory to the discipline of computer science. The Final Examination must be open and announced at least two weeks in advance. The dissertation must be distributed to the supervising committee at least two weeks in advance of the Final Examination. If the student does not pass the final exam, the committee will instruct the student as to what needs to be accomplished (and by when) to pass.

Time to degree for part-time students: Exceptions to the completion deadlines for the Qualifying Exam and Preliminary Exam may be made for part-time students at the discretion of the supervising committee.

Computer Science Core Requirements

COSC 5110 (Analysis of Algorithms) must be completed with a grade of B or better. A grade of B- is not sufficient. Students are strongly encouraged to take COSC 5110 the first time it is offered after enrollment.

Computer Science Breadth Requirements

Students must earn a grade of B or better in one class from the Theory category, one class from the Artificial Intelligence category, and two classes from the Systems category. A grade of B- is not sufficient. Thus there must be 12 credits taken to satisfy the breadth requirement. A list of courses in each category is available from the Department. Although some courses may be listed under multiple categories, a course may only count once towards the breadth requirement.

Graduate Minor

Requirements for a graduate minor in Computer Science are as follows:

- COSC 5110 Analysis of Algorithms
- 9 additional credits of 5000-level computer science courses

All 12 credits must be completed with a grade of B or better. A grade of B- is not sufficient.

Computer Science (COSC)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1010. Introduction to Computer Science I. 4. Introduces the fundamental concepts of programming from an object-oriented perspective. Topics include simple data types, control structures, array and string data structures, algorithm development, and debugging techniques. Emphasizes good software engineering principles and developing fundamental programming skills in the context of a language that supports the object-oriented paradigm.

1015. Introduction to Programming for Data Science. 3. [(none)◀▶Q] Provides an accelerated introduction to computing in the setting of Data Science. Topics include basic

programming techniques; data transformation; computing with vectors, matrices, and data frames; data visualization; and text processing. Credit may not be earned for both COSC 1010 and COSC 1015. Priority given to Engineering Honors students. *Prerequisite:* grade of C or better in MATH 1400 or Level 4 or higher on the Math Placement Exam within one year prior to the start of the course.

1030. Computer Science I. 4. Continues the introduction to the methodology of programming from an object-oriented perspective. The course emphasizes basic software design, expands the students’ knowledge of programming language syntax, expands the students’ ability to think and design in an object-oriented paradigm. Introduces the students to UML, pseudocode, and simple planning for the design of software. Also introduces the students to templates and the C++ STL. *Prerequisite:* COSC 1010.

1100. Computer Science Principles and Practice. 3. Introduces use of computers for algorithmic problem solving. Studies scope, major contributions, tools and current status of computer science. Presentation of computer science principles; use of software packages and evaluation of their effectiveness; and elementary programming. *Prerequisite:* C or better in MATH 1400 or in any University Studies QB or Level 4 or higher on Mathematics Placement Exam. (Offered based on sufficient demand and resources)

1101. First-Year Seminar. 3. [(none)◀▶FYS]
1200. Computer Information Systems. 3. Introduces computers and information processing, computer systems and hardware, computer software, information processing systems, information systems and information resource management. Uses word processing, data base language and electronic spreadsheet program in hands-on exercises. *Prerequisite:* passing of Mathematics Placement Examination at Level 2 or equivalent.

2000. Undergraduate Topics: Computer Science. 1-3 (Max. 6). Elementary topics current in computer science. *Prerequisite:* consent of instructor. (Offered based on sufficient demand and resources)

2030. Computer Science II. 4. Builds on the introduction to object-oriented programming begun in COSC 1010 and 1030 with an emphasis on algorithms, data structures, and software engineering. *Prerequisite:* COSC 1030.

2150. Computer Organization. 3. Introduces students to the organization and architecture of computer systems, beginning with the standard von Neumann model and then moving forward to more recent architectural concepts. *Prerequisite:* COSC 1030.

2300. Discrete Structures. 3. Introduces the mathematical concepts that serve as foundations of computer science: logic, set theory, relations and functions, graphs (directed and undirected), inductively defined structures (lists and trees), and applications of mathematical induction. Provides an introduction to abstract and rigorous thinking in advanced mathematics and computer science. Cross listed with MATH 2300. *Prerequisite:* COSC 1030, MATH 2200 or 2350.

3011. Introduction to Software Design. 3. Introduces the principles and practice of software design, including UML and design patterns. Uses case studies to illustrate design in action. *Prerequisites:* COSC 2030.

3015. Functional Programming. 3. Studies programming in the context of a functional language that emphasizes algorithmic strategies over syntactic detail. *Prerequisites:* COSC 2030 and 2300.

3020. Algorithms and Data Structures. 4. Introduces formal techniques to support the design and analysis of algorithms, focusing on both the underlying mathematical theory and practical considerations of efficiency. Topics include asymptotic complexity bounds, techniques of analysis, algorithmic strategies, and an introduction to automata theory and its application to language translation. *Prerequisites:* COSC 2030 and 2300.

3050. Ethics for the Computer Professional. 1. The proliferation of computers has had a profound effect on our society. Computing professionals must be aware of the social and ethical implications of our activities. Examines the codes of behavior related to computer science through readings, discussions and case studies. *Prerequisites:* junior standing and COSC major.

3100. Computer Science Education Seminar. 2. Provides an overview of the current social and research issues, technical trends and challenges facing computer science educators. *Prerequisites:* COSC 1030 and Education major only.

3340. Introduction to Scientific Computing. 3. Introduces basic numerical methods to solve scientific and engineering problems. Topics include: code structure and algorithms, basic numerical methods for linear systems, eigenvalue problems, interpolation and data fitting, nonlinear systems, numerical differentiation and integration. Cross listed with MATH 3340. *Prerequisites:* grade of C or better in MATH 2210.

3750. Linux Programming for System Applications. 3. Provide the necessary tools and skills to begin programming effectively on

UNIX and Linux operating systems. Topics will include, shells and basic shell scripting, Linux utilities, editors, compilation, I/O and the file system, sockets and interprocess communication, and time permitting, threads. *Prerequisites:* COSC 2150 and COSC 2030.

3890. Engineering Honors Program Research Methods. 3. A general approach to scientific research and graduate school preparation. Topics will include: finding a research mentor, literature search skills, using the scientific method for approaching a research problem and developing a research methodology, writing a research funding proposal, delivering a research presentation and selecting and applying for graduate school. Restricted to College of Engineering Honors Program students. Cross listed with ARE/ATSC/CE/CHE/EE/ES/PETE 3890. *Prerequisite:* sophomore standing.

3900. Upper Division Topics in Computer Science. 1-3 (Max. 9). Individual or small group pursuit of interdisciplinary problems in the use of computers or study of topics of interest within industry. *Prerequisite:* consent of instructor. (Offered based on sufficient demand and resources)

3970. Internship in Computing. 1-3 (Max. 3). Allows students to gain practical experience in computing. A signed contract with a supervisor and departmental adviser must be completed before enrolling for the internship. *Prerequisite:* COSC 3020.

4000. Topics in Computer Science for Educators. 1-6 (Max. 12). Current computer science topics appropriate for K-12 teachers. Credit may not be applied to major requirements in computer science or management information systems. *Prerequisite:* graduate standing. (Offered based on sufficient demand and resources)

4010. Special Topics in Computer Science. 1-3 (Max. 9). Individual or small group pursuit of interdisciplinary problems in the use of computers or study of advanced topics. (Maximum of 12 hours from 4010 and 5010 may be applied to graduate study.) *Prerequisites:* COSC 3020 concurrently and consent of instructor. (Offered based on sufficient demand and resources)

4100. Foundations of Computing. 3. Introduces several theoretical areas which are the basis of computer science. Languages and automata, computability, complexity, analysis of algorithms, logic, and the specification and correctness of programs. *Prerequisite:* COSC 3020.

4200. Computability and Complexity. 3. Introduction to theoretical study of computability and efficient computation. Finite-state and pushdown automata; turing machines and the Church-Turing thesis; undecidability, computational complexity; NP-completeness. *Prerequisite:* COSC 3020.

4210. Web Application Development. 3. The course covers the basics of developing data driven web applications. Topics include using responsive design for user interfaces, architectural patterns and frameworks, object-relational mapping, language-integrated queries, authentication, authorization, unit testing, using source control for code management, publishing web applications and cloud computing. *Prerequisite:* COSC 3011.

4220. Design and Implementation in Emerging Environments. 3. Students who have completed the analysis and design course extend their knowledge by implementing an information system in an emerging systems environment. Teams use project management principles to implement the system. *Prerequisite:* COSC 4210.

4340. Numerical Methods for Ordinary and Partial Differential Equations. 3. Further develops the skills needed for computational problem solving and numerical analysis. Topics addressed include: one-step and linear multistep methods for solving initial value problems; truncation errors, stability analysis, and convergence of the numerical methods; finite difference approximation for elliptic equations and initial boundary value problems; iterative methods for sparse linear systems. Students typically complete a final project in this course. Cross listed with MATH 4340. *Prerequisites:* grade of C or better in MATH 2310 and MATH 3340.

4420. Advanced Logic. 3. Studies advanced topics in mathematical logic. Takes up such topics as: uninterpreted calculi and the distinctive contributions of syntax and semantics; metatheory, including completeness and consistency proofs; modal logic and semantics; logic as a philosophical tool. Dual listed with COSC 5420; cross listed with MATH/PHIL 4420. *Prerequisite:* PHIL 3420 or equivalent.

4450. Computer Graphics. 3. Introduction to computer graphics, an increasingly important area of computer science. Computer graphics, together with multimedia and the World Wide Web, offers exciting new possibilities for the design of human-computer interfaces. Presents the principles, techniques, and tools that enable these advances. Dual listed with COSC 5450. *Prerequisites:* COSC 3020 and MATH 2250.

4550. Introduction to Artificial Intelligence. 3. A computational study of intelligent behavior. Focus is on intelligent agents, which could be software agents or robots. Covers how agents sense, reason, and act within their environment. Includes problem-solving, search, knowledge representation, planning, game playing, learning, and neural and belief networks. Dual listed with COSC 5550. *Prerequisites:* COSC 3020.

4555. Machine Learning. 3. Goal is to program machines to learn and improve their performance on their own, based on experience and/or data. First half covers machine learning techniques; second half covers applications. Dual listed with COSC 5555. *Prerequisite:* COSC 3020.

4560. Modern Robots and Softbots. 3. Popular agent designs: logic-based, biomimetic, and physicomimetic. Foundational issues on internal robot and softbot knowledge representations. Planning and control, followed by issues of how agents can reason and plan under real-world conditions of environmental uncertainty. Concludes with discussions about papers on modern robot and softbot applications, as well as invited lectures by graduate students and faculty. Dual listed with COSC 5560.

4570. Data Mining. 3. Examine methods that have emerged from artificial intelligence and statistics and proven to be of value in recognizing patterns and making predictions with large data sets. Will include both theory and practice while developing several projects. *Prerequisite:* COSC 4550.

4580. Honors Undergraduate Research. 3. An independent research experience for undergraduate students enrolled in the Engineering Honors Program. Before registering for this class, students are responsible for discussing their interests with faculty, identifying a willing research mentor, obtaining approval by said mentor, and communicating the student/faculty partnership to the appropriate staff in their home department. Must be in the Engineering Honors Program. Cross listed with ATSC/BE/CE/CHE/ES/ESE/PETE 4580. *Prerequisite:* junior or senior standing.

4730. Mobile Application Programming. 3. Introduces development of applications on mobile devices. Presents the principles, techniques, and tools for developing mobile applications. Differences between desktop applications and mobile applications are discussed. Dual listed with COSC 5730. *Prerequisite:* six hours of upper division COSC coursework.

4735. Advanced Mobile Programming. 3. Continues the development of applications on mobile devices. The focus is device sensors, such as camera, AR, VR, Bluetooth, embedded and connected devices. Dual listed with COSC 5735. *Prerequisite:* COSC 4730.

4740. Operating Systems Design. 4. Studies systems programming languages and computer systems design. Includes interacting processes, main storage management, procedure and data sharing, scheduling, deadlock problems and file management in batch processing and multi-programming systems. Operating system implementation. *Prerequisite:* COSC 2150 and COSC 3020.

4750. Systems Programming and Management. 3. Comparatively studies features found in commercial and experimental operating systems. Discusses issues in system-level programming and administration, including shell programming, file management, resource control, configuration and security. Advanced topics include multiprocessor and real-time operating systems. *Prerequisites:* COSC 2030.

4760. Computer Networks. 3. Examines network protocols using a top-down approach based on the Internet model. Course focuses on the application, transport, network and link layers. Also covers wireless communication. Discusses problems and current solutions regarding the efficient use of network resources in the global, multi-media Internet. *Prerequisites:* COSC 2150 and COSC 2030.

4765. Computer Security. 3. Introduces the topics of computer and network security and provides a foundation to allow students to identify, analyze, and solve computer security problems. *Prerequisite:* COSC 3020.

4780. Principles of Programming Languages. 3. Introduces the methods of analysis and design of programming languages. Covers syntax, typing schemes and the semantics (denotational and operational) in the context of functional and imperative programming languages. Students build interpreters to explore the implications of the different constructs on computational behavior. *Prerequisites:* COSC 3015.

4785. Compiler Construction 1. 3. Theory and implementation of interpreters and compilers. Compiler topics include lexical analysis, top-down and bottom-up parsing methods, symbol tables, and code generation from a block-structured language with recursion and parameters. Project uses compiler writing tools. Dual listed with COSC 5785. *Prerequisites:* COSC 2150 and COSC 3020.

4820. Database Systems. 3. Provides comprehensive coverage of the problems involved in database design, in-depth coverage of data models and database languages. Students acquire practical skills of conceptual/logical database design and general familiarity with the problems and issues of database management. *Prerequisite:* COSC 2030.

4840. Software Engineering. 3. Extends the ideas of software design and development from the introductory programming sequence to encompass the problems encountered in large-scale programs. Topics include software engineering techniques from the technical and managerial perspectives, with a strong emphasis on software design. *Prerequisites:* COSC 3020 and 3011.

4950. Senior Design I. 1. Students choose a senior design project, investigate alternate solutions and submit a preliminary project design. Periodic oral and written project progress reports are required. *Prerequisite:* COSC 3011 and COSC 3020.

4955. Senior Design II. 2. Students complete the senior design project partially designed in COSC 4950. Successful communication of the details of the solution through written documents and oral presentations will be required. *Prerequisite:* COSC 4950.

5000. Seminar in Computer Science. 1-3. (Max. 10). One or more current research areas in computer science are investigated. *Prerequisite:* consent of instructor.

5010. Graduate Topics in Computer Science. 1-6 (Max. 12). Individual or small group pursuit of computer science research areas. (Max. of 12 hours from COSC 4010 and COSC 5010 may be applied to graduate study). *Prerequisites:* graduate standing and consent of instructor.

5050. Research Writing in Computer Science. 3. Instruction in methods for performing and reporting research in the field of computer science. The primary task is preparation of a research paper; to that end, the class covers how to collect and analyze previously published work, generate and develop a research topic, and present research results in acceptable written form. *Prerequisite:* graduate standing, consent of instructor.

5110. Analysis Of Algorithms. 3. Analysis of algorithms to determine their time and space requirements. Beginning with data structures such as lists, stacks, trees, and sets and their implementations. The class then analyzes specific algorithms for internal sorting, hashing, and string search. Offered fall semester of even numbered years. *Prerequisites:* COSC 3020 or equivalent and consent of the department.

5120. Theory Of Computation. 3. Models of computation, the Church-Turing thesis, computable functions, decidable and enumerable sets, unsolvable problems, correctness of programs, and complexity of computation. The theory of computation provides precise answers to the fundamental questions of computer science: Which problems can be solved by machine computation and which can be solved using a reasonable amount of computer resources. *Prerequisite:* COSC 4100.

5200. Computational Complexity. 3. Study of efficient computation and computational intractability. Time and space complexity; P, NP, and the polynomial-time hierarchy; reductions and completeness; randomized complexity; non-uniform complexity; approximation algorithms and inapproximability. *Prerequisite:* COSC 4100 or COSC 4200.

5220. Languages and Automata. 3. The study of regular, context-free, and context-sensitive languages and their relations to finite-state, pushdown and linear-bounded automata. Context-free language recognition. The halting problem and decidability results. *Prerequisite:* COSC 4100.

5310. Computational Methods in Applied Sciences I. 3. First semester of a three-semester computational methods series. Review of iterative solutions of linear and nonlinear systems of equations, polynomial interpolation/approximation, numerical integration and differentiation, and basic ideas of Monte Carlo methods. Comparison of numerical techniques for programming time and space requirements, as well as convergence and stability. Cross listed with MATH 5310. *Prerequisites:* MATH 3310, COSC 1010.

5345. Computational Methods in Applied Sciences III. 3. Third semester of a three-semester computational methods series with emphasis on numerical solution of problems displaying sharp fronts and interfaces (non-linear conservation laws, Hamilton-Jacobi equations. Cross listed with MATH 5345. *Prerequisite:* MATH/COSC 5340.

5420. Advanced Logic. 3. Studies advanced topics in mathematical logic. Takes up such topics as: uninterpreted calculi and the distinctive contributions of syntax and semantics; metatheory, including completeness and consistency proofs; modal logic and semantics; logic as a philosophical tool. Dual listed with COSC 4420; cross listed with COSC/MATH 5420. *Prerequisite:* PHIL 3420 or equivalent; graduate standing.

5450. Computer Graphics. 3. Introduction to computer graphics, an increasingly important area of computer science. Computer graphics,

together with multimedia and the world-wide web, offers exciting new possibilities for the design of human-computer interfaces. Presents the principles, techniques, and tools that enable these advances. Dual listed with COSC 4450. *Prerequisites:* COSC 3020, MATH 2250.

5540. Computer Vision. 3. Provides students with an understanding of applying computer methodologies to process two-dimensional and three-dimensional images. Primary areas of investigation are image preprocessing, knowledge representation, pattern recognition and motion understanding. *Prerequisites:* COSC 3020, MATH 2205, MATH 2250.

5550. Introduction to Artificial Intelligence. 3. A computational study of intelligent behavior. The focus is on intelligent agents, which could be software agents or robots. Covers how agents sense, reason, and act within their environment. Includes problem-solving, search, knowledge representation, planning, game playing, learning, and neural and belief networks. Dual listed with COSC 4550. *Prerequisite:* COSC 3020.

5555. Machine Learning. 3. To program machines to learn and improve their performance on their own, based on experience and/or data. The first part covers machine learning techniques. The second part covers applications. Dual listed with COSC 4555. *Prerequisite:* COSC 3020.

5560. Modern Robots and Softbots. 3. Begins with a presentation of popular agent designs: logic-based, biomimetic, and physiocomimetc. Presents foundational issues on internal robot and softbot knowledge representations. Planning and control are then covered, followed by issues of how agents can reason and plan under real-world conditions of environmental uncertainty. Concludes with discussions about papers on modern robot and softbot applications, as well as invited lectures by graduate students and faculty in the UW COSC and ECE departments. Dual listed with COSC 4560.

5730. Mobile Application Programming. 3. Introduces development of applications on mobile devices. Presents the principles, techniques, and tools for developing mobile applications. Differences between desktop applications and mobile applications are discussed. Dual listed with COSC 4730. *Prerequisite:* COSC 3020.

5735. Advanced Mobile Programming. 3. Continues the development of applications on mobile devices. The focus is device sensors, such as camera, AR, VR, Bluetooth, embedded and connected devices. Dual listed with COSC 4735. *Prerequisite:* COSC 4730.

5750. Distributed Computing Systems. 3. Provides an in-depth study of distributed computing systems, including both architecture and software issues. Topics include concepts of distributed computing, communication primitives, distributed operating systems, distributed file management, and distributed programming languages. Particular attention is paid to modeling and analysis of distributed systems and algorithms. Programming projects and research papers are assigned. *Prerequisite:* COSC 5740.

5785. Compiler Construction I. 3. Theory and implementation of interpreters and compilers. Compiler topics include lexical analysis, top-down and bottom-up parsing methods, symbol tables, and code generation for a block-structured language with recursion and parameters. Project uses compiler writing tools. Dual listed with COSC 4785. *Prerequisites:* COSC 2150 and COSC 3020.

5790. Compiler Construction II. 3. Advanced topics concerning the front end of a programming language compiler, the description and implementation of features found in the back end of a compiler, and the run time environment. Topics include data type checking, global data flow analysis, flow graph reduction, local and global code optimization, and code generation. Reports on recent research papers. *Prerequisite:* COSC 4785 or 5785.

5820. Database Systems. 3. Provides comprehensive coverage of the problems involved in database design, in-depth coverage of data models and database languages. Students acquire practical skills of conceptual/logical database design and general familiarity with the problems and issues of database management. *Prerequisite:* COSC 3020.

5825. Advance Data Systems. 3. Provides comprehensive coverage of the problems involved in database system design and an in-depth examination of contemporary structures and techniques used in modern database management systems and database applications. *Prerequisite:* COSC 4820.

5920. Continuing Registration: On Campus. 1-2. (Max 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-16 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 3). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrollment in a graduate degree program.

5980. Dissertation Research. 1-12 (Max. 48). Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisites:* enrollment in a graduate level degree program.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

Department of Electrical and Computer Engineering

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Department Head: John McInroy

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JOHN E. McINROY, B.S. University of Wyoming 1986; M.S. Rensselaer Polytechnic Institute 1988; Ph.D. 1991; Professor of Electrical Engineering 2002, 1991.

SURESH S. MUKNAHALLIPATNA, B.E. University of Bangalore, India 1988; M.E. 1991; Ph.D. University of Wyoming 1995; Professor of Electrical Engineering 2010, 1997.

JOHN W. PIERRE, B.S. Montana State University 1986; M.S. University of Minnesota 1989; Ph.D. 1991; Professor of Electrical Engineering 2002, 1991.

CAMERON H.G. WRIGHT, B.S. Louisiana Tech University 1983; M.S. Purdue University 1988; Ph.D. University of Texas 1996; Professor of Electrical Engineering 2016, 2003.

Associate Professors:

DONGLIANG DUAN, B.E. Huazhong University of Science and Technology 2006; M.S. University of Florida 2009; Ph.D. Colorado State University 2012; Associate Professor of Electrical Engineering 2019, 2012.

EVA S. FERRE-PIKAL, B.S. University of Puerto Rico 1988; M.S. University of Michigan 1989; Ph.D. University of Colorado 1996; Associate Professor of Electrical Engineering 2004, 1998.

ROBERT F. KUBICHEK, B.S.C.S., B.S.E.E. University of Wyoming 1976; M.S. 1977; Ph.D. 1985; Associate Professor of Electrical Engineering 1997, 1991.

JOHN F. O'BRIEN, B.S. California State Polytechnic University, Pomona 1991; M.S. University of Wyoming 1997; Ph.D. Rensselaer Polytechnic Institute 2001; Associate Professor of Electrical Engineering 2009, 2003.

JON M. PIKAL, B.S. Purdue University 1988; M.S. University of Colorado 1993; Ph.D. Colorado State University 1999; Associate Professor of Electrical Engineering 2005, 1999.

Assistant Professors:

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NGA NGUYEN, B.S. Hanoi University of Science and Technology 2005; M.S. 2007; Ph.D. Michigan State University 2017; Assistant Professor of Electrical and Computer Engineering 2018.

DOMEN NOVAK, M.Sc. University of Ljubljana 2008; Ph.D. 2011; Assistant Professor of Electrical Engineering 2014.

Academic Professional:

JEFFREY R. ANDERSON, B.S.E.E. University of Utah 1989; M.S.E.E. 1992; Ph.D. University of Wyoming 2004; Associate Academic Professional Lecturer in Electrical and Computer Engineering 2012.

Adjunct Faculty:

Farhad Jafari, Elena Oggero, Guido Pagnacco

Professors Emeriti:

Mark Balas, Christos T. Constantinides, Jerry J. Cupal, Clifford D. Ferris, Jerry Hamann, Raymond G. Jacquot, Stanislaw Legowski, John W. Steadman, A.H.M. Sadrul Ula, David Whitman

Electrical Engineering

The program of study outlined in the curriculum has been planned to provide the depth of understanding necessary to meet challenges of changing technology while being flexible enough to allow students to pursue in-depth study in at least one area of electrical engineering. In order to attain this, students are required to gain an understanding of mathematics and the basic engineering sciences. The fundamental electrical engineering education consists of courses in circuits, networks, electromagnetics, electronics, digital systems, communications, controls and energy conversion. Selection of elective courses, in consultation with the academic adviser, enables

students to specialize in the above mentioned areas, as well as in robotics, microcircuits, microprocessors and high frequency electronics.

Laboratory work associated with electrical engineering courses is an important part of the curricula. This work helps students gain experience in applying the theoretical knowledge they acquire to practical engineering problems. Engineering design is an important component of the curriculum that concludes with a significant design experience in the senior year. Additional programs are described below.

F.M. Long Bioengineering Option. Named in honor of UW Professor Francis M. Long, this area offers excellent opportunities for those interested in applying the techniques of the electronic engineer to problems of environmental science, biology and medicine. Employment opportunities exist in state and federal agencies, industry and medical institutions. Career placement includes such areas as environmental monitoring, design and development of biological and medical instrumentation and clinical engineering. With minor modifications, the curriculum shown may be used as preparation for entrance to medical or dental school.

Computer Engineering

Computer Engineering is a blend of Computer Science and Electrical Engineering. In fact, a Computer Engineering student can change majors to Computer Science within the first three semesters without losing any credits. More careful planning is required to switch from Computer Science to Computer Engineering. Computer Engineering students receive training that allows them to design complex computer systems and embed them in custom applications such as robots, spacecraft, automobiles, etc. A typical system may interface with a sensor to measure the world, then decide how to best use the information to achieve goals and eventually turn on actuators which perform the needed task. They also develop computer vision systems, high performance computers and software, and the internet of things. They take many of the same required courses as Electrical Engineers, but fill in their electives with computer specific courses. Graduates have the ability to design electric circuits, understand network hardware, design computer systems, and write the software inside those systems. Compared to Electrical Engineers, Computer Engineers have less breadth of knowledge in Electrical Engineering but more depth in software and computer hardware. Compared to Computer Scientists, Computer Engineers know much

more about hardware and signal/system theory. Computer Engineers sometimes also major in either Electrical Engineering or Computer Science to get two degrees.

Graduate Program

The department offers programs of study leading to the Master of Science and Doctor of Philosophy degrees in electrical engineering. Study programs are individually planned to students' interests in both course work and research.

Grade Policy

Electrical and computer engineering majors must achieve a grade of C (2.000) or better on courses that are prerequisites for courses within the student's course of study. Students must also achieve a grade of C (2.000) or better in all required mathematics courses.

Concurrent Major and Minor

The department offers a concurrent major and minor in both the electrical engineering and computer engineering programs. Consult the department office for a current detailed list of requirements.

Program Educational Objectives for Electrical and Computer Engineering

Graduates of the University of Wyoming Electrical and Computer Engineering Program will:

- Be able to successfully practice the profession of Electrical or Computer Engineering.
- Be prepared and motivated to accept challenging assignments and responsibilities and be productive members of society.
- Demonstrate successful career growth (e.g., professional registration, graduate school, promotion and advancement, patents, publications).

University of Wyoming, Electrical and Computer Engineering Program, Student Outcomes

All Electrical (Computer) Engineering graduates shall demonstrate:

- (1) an ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics

- (2) an ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
- (3) an ability to communicate effectively with a range of audiences
- (4) an ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
- (5) an ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
- (6) an ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
- (7) an ability to acquire and apply new knowledge as needed, using appropriate learning strategies.

Electrical Engineering Curriculum¹

Suggested Course Sequence

FRESHMAN YEAR: Fall		Hrs.
CHEM	1020.....	4
FYS	1101 ²	3
ENGL	1010.....	3
ES	1060.....	3
MATH	2200.....	4
Total Hrs.		17
FRESHMAN YEAR: Spring		Hrs.
ES	2110 ³	3
MATH	2205.....	4
MATH	2250.....	3
PHYS	1210 ⁴	4
Total Hrs.		14
SOPHOMORE YEAR: Fall		Hrs.
ES	2120 ³	3
ES	2210.....	3
MATH	2210.....	4
PHYS	1220.....	4
Human Culture (H)	.....	3
Total Hrs.		17
SOPHOMORE YEAR: Spring		Hrs.
EE	2220.....	4
EE	2390.....	4
MATH	2310.....	3
U.S. & WY Constitutions (V)	.....	3
Math/Science Elective ⁵	.....	3
Total Hrs.		17

JUNIOR YEAR: Fall		Hrs.
EE	3150.....	3
EE	3220.....	3
EE	3310.....	4
EE	3510.....	4
Communication II (COM2)	.....	3
Total Hrs.		17

JUNIOR YEAR: Spring		Hrs.
EE	3330.....	4
EE	4075.....	4
EE	4220.....	3
EE	4390.....	3
EE	4620.....	3
Total Hrs.		17

SENIOR YEAR: Fall		Hrs.
EE	4440.....	3
EE	4820 ⁸	2
Technical Elective ⁶	.....	4
BE or EE Elective ⁷	.....	3
Human Culture (H)	.....	3
Total Hrs.		15

SENIOR YEAR: Spring		Hrs.
EE	4830 ⁸	2
BE or EE Elective ⁷	.....	3
BE or EE Elective ⁷	.....	3
BE or EE Elective ⁷	.....	3
BE or EE Elective ⁷	.....	3
Total Hrs.		14
Total Credit Hours		128

1-Students must have a minimum cumulative GPA 2.000 in all Engineering courses for graduation. GPA of 2.000 or higher is required for all prerequisite courses. Students must complete a minimum of 42 hours of upper division coursework, 30 of which must from the University of Wyoming.

2-EE 1101 is recommended for EE and CPEN majors
 3-Or any ES, EE, BE course (>2000 level), or COSC 3011 or COSC 3750

4-PHYS 1210: no credit can be earned in PHYS 1210 if taken after ES 2120. PHYS 1220 should be taken before or concurrently with ES 2210.

5-One course from the ECE Math/Science Elective List. ABET requires a minimum of 30 hours of Math/Science Electives.

6-Any course marked as technical electives in the ECE. Credit can be earned for professional internships or CO-OPs.

7-A minimum of 15 hours of electives from BE or EE courses (4000-level or above) is required.

8- To meet the COM3 requirement with EE 4820 and 4830 the COM2 course must be taken before EE 4820. Also, EE 4820 and EE 4830 must be taken in sequence. COM 2 grade of C or better is required.

F.M. Long Bioengineering Curriculum¹

Suggested Course Sequence

FRESHMAN YEAR: Fall Hrs.

CHEM 1020	4
FYS 1101 ²	3
ENGL 1010	3
ES 1060	3
MATH 2200	4
Total Hrs.	17

FRESHMAN YEAR: Spring Hrs.

CHEM 2300	4
ES 2110 ³	3
MATH 2205	4
PHYS 1210 ⁴	4
Total Hrs.	15

SOPHOMORE YEAR: Fall Hrs.

ES 2120 ³	3
ES 2210	3
MATH 2210	4
PHYS 1220	4
Human Culture (H)	3
Total Hrs.	17

SOPHOMORE YEAR: Spring

EE 2220	4
EE 2390	4
LIFE 1010	4
MATH 2250	3
MATH 2310	3
Total Hrs.	18

JUNIOR YEAR: Fall Hrs.

EE 3220	3
EE 3310	4
EE 3510	4
Communication II (COM2)	3
Human Culture (H)	3
Total Hrs.	17

JUNIOR YEAR: Spring Hrs.

EE 3330	4
EE 4075	4
EE 4390	3
MOLB 2021	4
Total Hrs.	15

SENIOR YEAR: Fall Hrs.

EE 4330 or BE 4810	3-4
EE 3150	3
EE 4820 ⁷	2
US & WY Constitutions (V)	3
Technical or Cultural Context Elective ⁵	3
Total Hrs.	14-15

SENIOR YEAR: Spring Hrs.

EE 4620 or BE 4820	3
EE 4220	3
EE 4830 ⁷	2

MOLB 3610	4
BE or EE Elective ⁶	3
Total Hrs.	15
Total Credit Hours	128

1-Students must have a minimum cumulative GPA 2.000 in all Engineering courses for graduation. GPA of 2.000 or higher is required for all prerequisite courses. Students must complete a minimum of 42 hours of upper division coursework, 30 of which must from the University of Wyoming.

2-EE 1101 is recommended for EE and CPEN majors

3-Or any ES, EE, BE course (>2000 level), or COSC 3011 or COSC 3750

4-PHYS 1210: no credit can be earned in PHYS 1210 if taken after ES 2120. PHYS 1220 should be taken before or concurrently with ES 2210.

5-Any course marked as technical electives in the ECE. Credit can be earned for professional internships or CO-OPs.

6-A minimum of 19 hours of EE/BE electives (4000-level or above) is required.

7- To meet the COM3 requirement with EE 4820 and 4830 the COM2 course must be taken before EE 4820. Also, EE 4820 and EE 4830 must be taken in sequence. COM 2 grade of C or better is required.

Computer Engineering Curriculum¹

Suggested Course Sequence

FRESHMAN YEAR: Fall Hrs.

CHEM 1020	4
COSC 1010	4
FYS 1101 ²	3
ENGL 1010	3
MATH 2200	4
Total Hrs.	18

FRESHMAN YEAR: Spring Hrs.

COSC 1030	4
ES 2110 ³	3
MATH 2205	4
PHYS 1210 ⁴	4
Total Hrs.	15

SOPHOMORE YEAR: Fall Hrs.

COSC 2030	4
ES 2120 ³	3
ES 2210	3
MATH 2210	4
PHYS 1220	4
Total Hrs.	18

SOPHOMORE YEAR: Spring Hrs.

COSC 2150	3
EE 2220	4
EE 2390	4
MATH 2300	3
MATH 2310	3
Total Hrs.	17

JUNIOR YEAR: Fall Hrs.

EE 3220	3
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EE 3310	4
EE 4490	3
Communication II (COM2)	3
Human Culture (H)	3
Total Hrs.	16

JUNIOR YEAR: Spring Hrs.

EE 3330	4
EE 4220	3
EE 4390	3
Math/Science Elective ⁴	3
Human Culture (H)	3
Total Hrs.	16

SENIOR YEAR: Fall Hrs.

COSC 4760 or EE 4870	3-4
EE 3150	3
EE 4820 ⁷	2
EE or BE Elective ⁶	3 or 4
U.S. & WY Constitutions (V)	3
Total Hrs.	14

SENIOR YEAR: Spring Hrs.

EE 4830 ⁷	2
CPEN Elective ⁶	3
Total Hrs.	14
Total Credit Hours	128

1-Students must have a minimum cumulative GPA 2.000 in all Engineering courses for graduation. GPA of 2.000 or higher is required for all prerequisite courses. Students must complete a minimum of 42 hours of upper division coursework, 30 of which must from the University of Wyoming.

2-EE 1101 is recommended for EE and CPEN majors

3-Or any ES, EE, BE course (>2000 level), or COSC 3011 or COSC 3750

4-PHYS 1210: no credit can be earned in PHYS 1210 if taken after ES 2120. PHYS 1220 should be taken before or concurrently with ES 2210.

5-Any course marked as technical electives in the ECE. Credit can be earned for professional internships or CO-OPs.

6-CPEN Option Courses: Choose four (4) classes from this list, at most two of which can be from the Computer Science department. Listing of currently available courses includes: COSC 3020, COSC 4450, COSC 4550, COSC 4555, COSC 4560, COSC 4730, COSC 4740, COSC 4760, EE 4245, EE 4340, EE 4345, EE 4440, EE 4530, EE 4590, EE 4870, EE 4990, EE 5390, EE 5430, EE 5630, and EE 5650. EE 4075 is not an allowed CPEN option course. Other EE and COSC graduate-level classes may be considered upon petition. Prerequisites for upper division electives vary. Consult an academic advisor and the course descriptions in the University Catalog for each course.

7-To meet the COM3 requirement with EE 4820 and 4830 the COM2 course must be taken before EE 4820. Also, EE 4820 and EE 4830 must be taken in sequence. COM 2 grade of C or better is required.

Minor Requirements

Electrical Engineering Minor Requirements:

ES2210 Electric Circuit Analysis (3 credits) plus a total of 20 credits of electrical engineering (EE) or bioengineering (BE) courses. You must have a minimum of 12 credits of EE/BE courses that are not counted toward your major.

Computer Engineering Minor Requirements:

COSC 2150 and EE4490 plus 17 credits of electrical engineering (EE) or CPEN Elective courses. The following COSC courses can also be used: COSC 1010, COSC 1030, COSC 2030, and COSC 4760. You must have a minimum of 12 credits of courses that are not counted toward your major.

Graduate Study

The department offers programs of study leading to the degrees of Master of Science and Doctor of Philosophy in electrical engineering. The areas of major concentration at the graduate level are:

- Bio-Engineering
- Controls
- Electrical Energy Systems
- Electronic Systems and Devices
- Robotics
- Signal Processing and Computer Networks

The department also offers a combined B.S./M.S. program for exceptional students wishing to obtain both degrees in a shorter period of time.

Program Specific Admission Requirements

Statement of purpose

Official transcripts from all post-secondary institutions attended

GRE verbal percentile minimum of 45 percent. GRE quantitative percentile minimum of 65 percent.

TOEFL total of 79 iBT or IELTS total 6.5.

Program Specific Graduate Assistantships

Additionally, all international students who are state-funded teaching assistantships or any international student with teaching responsibilities are required to complete an Oral Proficiency Interview (OPI). Students will need to follow the recommendations to improve their English skills. Students on state-funding who fail to follow the recommendations or do not meet the minimum proficiency by the end of

their first semester will not be able to receive any state-funding until they have demonstrated proficiency.

Program Specific Degree Requirements

Quick Start BS/MS Program

The combined B.S./M.S. program in electrical and computer engineering enables especially well-qualified students to be admitted to the M.S. program during the junior year of their B.S. program, and to work thereafter towards both the B.S. and M.S. degrees. These students would earn the B.S. in either electrical engineering or computer engineering and the M.S. degree in electrical engineering following the current curricula.

This program allows for early planning of the M.S. portion of the student's education, taking graduate courses as part of the B.S. degree, more flexibility in the order in which courses are taken, and more efficient use of what would otherwise be a final semester with a light credit hour load.

Up to 6 credit hours from UW, at the 5000-level or above, may be counted toward both the B.S. and M.S. degree programs.

For further information please visit our Web site at <http://www.uwyo.edu/electrical/graduate/prospective/ms/quickstart.html>.

Master's Programs

Plan A (thesis)

This is a minimum 30 credit hour program, 26 hours coursework and 4 hours of thesis

16 credit hours (minimum) in ECE formal coursework

3 credit hours (minimum) in formal coursework outside the department and approved by the student's committee

7 additional credit hours in or out of the department with committee approval
4 or more credit hours of M.S. thesis research

Of the above credit hours in formal coursework, no more than 12 credit hours can be 4000 level

The candidate must meet the minimum requirements for the Master of Science degree and also complete and defend a master's thesis.

Plan B (Project)

This is a 30 hour program:

18 (minimum) in ECE formal coursework

3 (minimum) in formal coursework outside the department and approved by the student's committee

9 additional credits in or out of the department with committee approval

Of the above credit hours in formal coursework, no more than 12 can be 4000 level.

The candidate must meet the minimum requirements for the master of science degree and complete a plan B project.

Satisfying the "Plan B project" can be completed in one of the following ways:

Complete a project for a 5000-level EE course, including a class presentation

Complete an independent project under EE 5880 (up to three credit hours), including a presentation

Plan B (Coursework only)

This is a 30 hour program:

18 (minimum) in ECE formal coursework

3 (minimum) in formal coursework outside the department and approved by the student's committee

9 additional credits in or out of the department with committee approval

Of the above credit hours in formal coursework, no more than 12 can be 4000 level.

Doctoral Program

Ph.D. Degree Requirements:

Ph.D. Credit Allocation (all at 4000 level minimum)

72 hours (minimum) of acceptable graduate coursework

42 hours (minimum) from ECE and closely related formal course work (EE 5980: Dissertation Research not counting toward this minimum)

Of those 42 hours, no more than 12 hours can be at the 4000 level

Courses required by the department bachelor of science degree may not be applied for graduate credit

6 hours (maximum) of EE 4800 (Problems in ...) can be counted for program of study credit

6 hours (maximum) of EE 5880 (Problems in ...) can be counted for program of study credit

9 hours (maximum) of EE 5600 (Statistical Signal Processing in ...) can be counted for program of study credit

In addition to the minimum requirements of the university, doctoral students must pass a written and oral comprehensive examination, part of which is a written proposal explaining their planned dissertation research. The student after completing successfully the oral comprehensive examination and before defending the completed dissertation must present their research work at an ECE department seminar. The student must also present and defend a completed dissertation. Programs of study, including coursework and any research tools, are arranged by consultation between the students and their graduate committee.

Electrical Engineering (EE)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦♦Q]).

1010. Introduction to Electrical and Computer Engineering. 1. Introduction to Electrical and Computer Engineering through a laboratory experience. Students perform both hardware and computer laboratory exercises in a wide range of areas of electrical and computer engineering.

1101. First-Year Seminar. 3. [(none)♦♦FYS] 2220 [3320]. Circuits and Signals. 4. Review of sinusoidal steady state analysis and ac power. Mutual inductance and linear transformers. Laplace transform. Laplace transform in circuit analysis. Frequency dependent circuits, including RLC circuit resonance. Magnitude and phase response, complex poles and zeros. Bode plots. Filter circuit fundamentals. Fourier series. Laboratory. *Prerequisite:* ES 2210, or ES 2215 and ES 2216. (Offered spring semester only)

2390. Digital Systems Design. 4. Binary logic, digital logic gates, reduction of Boolean expressions, combinational logic design. MSI and LSI combinational logic ICs, flip-flops, synchronous and asynchronous sequential systems design, MSI and LSI sequential system ICs, and algorithmic state machines. *Prerequisites:* COSC 1010 or COSC 1015 or COSC 1030 or ES 1060, and MATH 2205.

2800. Problems In: __, 1-3 (Max. 3). Section 1 is individual study. Other sections are group study by seminar or class format. Features topics not included in regularly offered courses. *Prerequisite:* consent of instructor.

3150. Electromagnetics. 3. A thorough study of static electric and magnetic fields using vector methods with an introduction to dynamic fields. *Prerequisites:* ES 2210, or ES 2215 and ES 2216, MATH 2210, and PHYS 1220 or concurrent enrollment.

3220. Signals And Systems. 3. Discrete and continuous-time signals and systems. Topics include linear time-invariant systems; convolution; difference equations; FIR and IIR systems; sampling, aliasing, reconstruction, and quantization. Frequency domain concepts include discrete and continuous Fourier transforms, Z-transforms, system frequency response, Laplace transform properties, and applications of digital filters and DFT analysis. *Prerequisite:* EE 2220. (Offered spring semester only)

3310. Electronics I. 4. Physical characteristics and models of semiconductor devices with application to electronic circuit design. Diode circuits, single transistor amplifiers, biasing, and load lines. Laboratory. *Prerequisites:* PHYS 1220 or PHYS 1320 or EE 3150, and EE 2220 or concurrent enrollment. (Offered fall semester only)

3330. Electronics II. 4. Current sources, differential and multistage amplifiers; circuits with ideal and non-ideal operational amplifiers; low and high band frequency response, feedback, stability, gain and phase margin of amplifiers; output stages, class A and push-pull; monolithic operational amplifier; oscillators; transistors as switches and introduction to digital electronic circuits. Laboratory. *Prerequisites:* EE 2220 and EE 3310. (Offered spring semester only)

3510. Electric Machines and Power Systems. 4. Polyphase AC circuits; single phase and polyphase transformers; AC synchronous and induction machines; introduction to power systems and per unit system; transmission line parameters; steady-state operations of transmission lines; power flows; transient stability; synchrophasor system and its applications. *Prerequisite:* ES 2210, or ES 2215 and ES 2216.

3890. Engineering Honors Program Research Methods. 3. A general approach to scientific research and graduate school preparation. Topics will include: finding a research mentor, literature search skills, using the scientific method for approaching a research problem and developing a research methodology, writing a research funding proposal, delivering a research presentation and selecting and applying for graduate school. Restricted to College of Engineering Honors Program students. Cross listed with ARE/ATSC/CE/CHE/COSC/ES/PETE 3890. *Prerequisite:* sophomore standing.

4075 [ES 3075]. C++ with Numerical Methods for Engineers. 4. Introduction to the fundamentals of practical engineering programming, using specific applications of numerical methods to demonstrate these prin-

ciples. The use of an object oriented approach using C++ in an efficient manner is emphasized. Other solution approaches, including C and Matlab will be discussed as appropriate. Credit will not be allowed in both EE 4075 and ES 3070. *Prerequisites:* MATH 2205 and (COSC 1010, COSC 1015, or ES 1060) and (MATH 2250 or MATH 2310) or consent of instructor.

4220. Probabilistic Signals and Systems. 3. Fundamentals of probability and statistics for engineers; reliability in engineering systems; random processes, statistical estimation, auto/cross correlation and power spectral density functions and linear filtering of random signals. *Prerequisites:* MATH 2210 and EE 3220. EE 3220 may be taken concurrently.

4245. Digital Signal Processing. 3. Sampling and oversampling A/D's; FIR and IIR digital filter design, effects of quantization, practical realizations; applications of the discrete and fast Fourier Transform (DFT and FFT); correlation, periodograms, window effects, multi-rate techniques, multi-dimensional signal processing, and other topics in digital signal processing. *Prerequisite:* EE 3220.

4250. Network Synthesis. 3. Characterization and design specification of analog filters. First and second order passive and active filters. Butterworth and Chebyshev filter responses. Audio frequency active filter synthesis using operational amplifiers. Introduction to frequency transformations and sensitivity. *Prerequisites:* EE 2220 and 3330 or concurrent enrollment.

4300. Microwave and RF Circuits. 3. Analysis and design of microwave and RF circuits with applications to communication and radar systems. Review of transmission line concepts and the Smith Chart, scattering parameters, microstrip lines, and matching networks. Analysis and design of microwave and RF amplifiers, oscillators, and mixers. Dual listed with EE 5300. *Prerequisite:* EE 3150 or PHYS 1220, EE 3330 or concurrent enrollment, or consent of instructor.

4330 [4370]. Electronic Systems Design. 4. Analog integrated circuits such as amplifiers (operational, instrumentation, isolation, video, transconductance, comparator, logarithmic and exponential); voltage regulators; analog multipliers and dividers; AC to DC converters; sample and hold circuits; digital to analog converters; analog to digital converters; function generators; phase locked loops. Includes design procedures for electronic systems implementing analog integrated circuits. Laboratory. *Prerequisites:* EE 2390 and 3330.

4340. Semiconductor Materials and Devices. 3. Physical properties of semiconductor materials and devices, including crystal lattices and energy bands, carrier generation, transport, and recombination. PN, metal-semiconductor, and heterojunction operation. Field Effect Transistors, including Metal Oxide Semiconductor (MOSFET), Junction (JFET), METal Semiconductor (MESFET), and High Electron Mobility (HEMT) transistors. Bipolar Junction (BJT) and Heterojunction (HBT) Transistor operation. Cross listed with PHYS 4340. *Prerequisite:* PHYS 1220 or 1320.

4345. Hardware Digital Signal Processing. 3. Hands-on introduction to real-time digital signal processing. Programming DSP algorithms using C on modern DSP hardware. Students gain deep understanding of fundamental DSP concepts by implementing selected applications including sampling, reconstruction, FIR and IIR filters, signal generation, and FFT. Hardware concepts include EDMA, memory maps, interrupts, buffered serial ports. *Prerequisite:* EE 3220.

4360. VLSI Design. 3. Introduction to CMOS processing, MOS fundamentals including devices models; switching and timing; analog subcircuits and amplifiers; inverters and CMOS gates; concept of standard cells and fully custom design; use of SPICE, digital simulation, and chip layout and verification software. *Prerequisites:* EE 2390, and EE 3330 or concurrent enrollment.

4390. Microprocessors. 3. Design of microcomputers, controllers and instruments which use microprocessors. Semiconductor memory design, CPU architecture, bus structure and timing, input-output interfaces and devices, assembly language programming, assemblers, compilers, editors and simulators. Emphasizes design techniques. Laboratory. *Prerequisite:* EE 2390. (Normally offered once a year)

4440. Communication Theory. 3. Amplitude and angle modulation and demodulation; digital baseband and carrier communication systems; performance of communication systems; and current topics in communication systems. *Prerequisites:* EE 3220 and EE 4220. (Normally offered once a year)

4490. Hardware Descriptive Language (HDL) Digital Design. 3. Hardware Description Language design of digital systems. Industrial CAD tools are used to produce a functional description of hardware that is both simulated and then synthesized into hardware. Methods to describe both combinational logic and synchronous devices are given. Devices such as CPLDs and FPGAs are targeted in this design process. Emphasizes design techniques. *Prerequisite:* EE 2390.

4510. Power Systems. 3. Electric power distribution and transmission. Distribution systems, transmission line calculations, installation and protection; substations, corona, protective relaying and carrier current communication and telemetering. Introduction to system stability studies. *Prerequisites:* ES 2210 and EE 3510.

4590. Real Time Embedded Systems. 3. Emphasizes a systems approach to real time embedded systems. Students are expected to apply methodical system design practices to designing and implementing a microprocessor-based real time embedded system. Students employ a robot-based educational platform to learn the intricacies of real time embedded systems, distributed processing, and fuzzy logic. Students learn processor input/output interfacing techniques. Students use state-of-the-art design and troubleshooting tools. Dual listed with EE 5590. *Prerequisite:* EE 4390.

4620. Automatic Control Systems. 3. Control theory and design methods focused on application. Feedback. Performance limits. Routh-Hurwitz, root locus, Nyquist. Nonminimum-phase systems. State feedback. Proportional-Integral-Derivative control. Lead/lag. High-order compensation. Discrete controllers. *Prerequisite:* EE 2220 or ME 3020.

4621. Honors Automatic Control Systems. 3. Control theory and design methods focused on application. Feedback. Performance limits. Routh-Hurwitz, root locus, Nyquist. Nonminimum-phase systems. State feedback. Proportional-Integral-Derivative control. Lead/lag. High-order compensation. Discrete controllers. Honors students will at the end of the semester design a high-performance control system for a sophisticated plant with realistic feedback limitations. *Prerequisite:* EE 2220 or ME 3020.

4800. Problems in _____. 1-6 (Max. 6). Section 1 is individual study. Other sections are group study by seminar or class format. Features topics not included in regularly offered courses. *Prerequisite:* consent of instructor.

4820. Senior Design I. 2. Students choose a senior design project and complete the preliminary design. This stage of senior design includes investigation of alternative solutions that meet the project's requirements, cost analysis, and building the prototype circuit. Periodic oral and written project progress reports are required. *Prerequisites:* EE 2220, EE 2390, and EE 3310 or concurrent enrollment, plus 6 hours of 4000 level EE/BE classes, or concurrent enrollment. COM2 must be passed with a C or better grade. (Offered fall semester only)

4830. Senior Design II. 2. Students complete the senior design project partially designed in EE 4820. The final result of the senior design

project includes assembly of a PC board hardware that meets the project's requirements and final report describing the design procedure, designed hardware and software, and results of final testing. Periodic oral and written project progress reports are required. *Prerequisites:* EE 4820 and selected courses in the area of the design project. (Offered spring semester only)

4870. Computer Network Hardware. 4. Basic LANs, Ethernet LAN architecture, and classical Ethernet CSMA/CD MAC protocol. 10Mbps, 100 Mbps, and gigabit Ethernet architecture. Introduction to switching, queuing theory, architecture, design and performance analysis of switch fabrics. Architecture, design, algorithms and performance analysis of Routing, Cellular Networks. TCP/IP Protocol. *Prerequisites:* EE 2390.

4990. Advanced Microprocessors. 3. Architecture and instruction set of Intel family of microprocessors; Intel System Development Kit and its monitor program; Microsoft Macro Assembler (MASM) and Visual C/C++ Express; modular programming; High level language compilers of object code; Interface design issues of peripheral devices to Personal Computer. *Prerequisite:* EE 4390.

5210. Systems Theory. 3. Review of linear time-invariant systems theory. Laplace, Fourier, and Z-transforms. Introduction to complex variable theory and its application to integral transform inversion. State variable formulation of physical systems. Application of linear algebra and matrices to the analysis of finite-state constant differential systems. Controllability and observability. *Prerequisite:* EE 4620.

5300. Microwave and RF Circuits. 3. Analysis and design of microwave and RF circuits with applications to communication and radar systems. Review of transmission line concepts and the Smith Chart, scattering parameters, microstrip lines, and matching networks. Analysis and design of microwave and RF amplifiers, oscillators, and mixers. Dual listed with EE 4300. *Prerequisite:* EE 3150 or PHYS 1220, EE 3330 or concurrent enrollment, or consent of instructor.

5330. Advanced Electronic Systems Design. 3. Theory of errors. High accuracy: multiplexers; voltage references; sample and hold circuits. Amplifiers: programmable gain; high speed voltage feedback; current feedback. Noise in integrated circuits. Pulse code modulation ADC; sigma delta ADC; oversampling; undersampling. Analog and digital audio systems. CD players. Superheterodyne and digital receivers. Signal transmission and conditioning. Hardware design techniques. *Prerequisite:* EE 4330 and 4210.

5340. Advanced Semiconductor Material and Devices. 3.

Advanced semiconductor materials and device concepts including noise in semiconductors, heterostructure and quantum fundamentals, high power materials and devices, high performance transistors including the MESFET, HEMT, and HBT. Also discusses GUNN and IMPATT diodes, Resonant Tunneling devices, and future computing devices based on the quantum properties of semiconductors. *Prerequisite:* EE 4340.

5350. Optoelectronic Semiconductor Materials and Devices. 3.

Optoelectronic properties of semiconductor materials and devices. Includes a review of the basic electronic properties of semiconductors materials, epitaxial growth, optical properties including absorption and emission of light, effects of quantum confinement and strain, and Heterostructures. Operation and optimization of basic optoelectronic devices including: photodetectors, LEDs Lasers, and modulators. *Prerequisite:* EE 4340.

5360. Digital VLSI Design. 3.

Digital building blocks, stick diagrams, CMOS cells and arrays, CMOS digital subsystems and systems. Chip design software such as layout, simulators and digital synthesis using HDL. Digital design verification and timing issues. *Prerequisite:* EE 4360.

5390. Computer Architecture. 3.

Examines the various methodologies used in the design of high-performance computer systems. Topics include CISC and RISC architecture and instruction sets, pipelining, instruction-level parallelism, memory hierarchy (including cache) design and computer networks. *Prerequisite:* EE 4390.

5400. Introduction To Robotics. 3.

Representation of pose using Euler angles, quaternions and homogeneous coordinate transformations. Forward and inverse kinematics of rigid body manipulators. Velocity and force transformation in a rigid robot using Jacobians. Trajectory generation using splines. Robotic vision for depth measurement. Analysis of actual robotic systems. *Prerequisite:* MATH 2250.

5410. Neural and Fuzzy Systems. 3.

Theory of feed forward and recurrent neural networks. Supervised and unsupervised learning theories. Fuzzy logic and systems. Associative memories. Matching and self-organizing networks. Application of neural and fuzzy systems. *Prerequisite:* EE 3220.

5430. 3-D Computer Vision. 3.

This course is intended to provide a mathematical framework for describing three dimensional imaging and computer vision. Topics include 3-D coordinate transforms, image formation, camera cali-

bration, reconstruction from two views, SIFT detection, hidden Markov models, Markov random fields, and “bag-of-words” visual description. *Prerequisites:* EE 4220, MATH 2250.

5450. Topics in Robotics. 3.

Topics vary between offerings, but include exponential coordinates for describing rigid motion, parallel machines, robotic vision, actuators and sensors, calibration, quaternions, motion planning, multifinger grasp dynamics, singularities, and singularity-free design, and limited-DOF machines. *Prerequisite:* MATH 2250, senior or higher level standing and permission of the instructor.

5460. Probabilistic Robotics. 3.

Fundamental theory underlying the robust sensing and planning used in self-driving machines is developed. Topics covered are: Bayesian, Kalman, and Particle Filters; simple ground robot motion models; mobile robot localization; simultaneous localization and mapping; partially observable Markov decision processes. *Prerequisite:* EE 4220.

5490. Convex Optimization. 3.

Covers fundamentals of numerical convex optimization. These methods have potential applications in many fields, so the goal of the course is to develop the skills and background needed to recognize, formulate, and solve convex optimization problems. Covers convex sets, convex functions, convex optimization problems and applications. *Prerequisites:* MATH 2250 and senior or higher level standing.

5590. Real Time Embedded Systems. 3.

Emphasizes a systems approach to real time embedded systems. Students are expected to apply methodical system design practices to designing and implementing a microprocessor-based real time embedded system. Students employ a robot-based educational platform to learn the intricacies of real time embedded systems, distributed processing, and fuzzy logic. Students learn processor input/output interfacing techniques. Students use state-of-the-art design and troubleshooting tools. Dual listed with EE 4590. *Prerequisites:* EE 4390.

5600. Statistical Signal Processing in. 2-4.

(Max. 9). Topics vary between offerings but include signal detection, feature extraction and pattern recognition, information theory and coding, spectral analysis, identification, speech processing, image processing, and seismic processing. *Prerequisite:* EE 4220.

5610. Random Processing Theory I. 3.

Introduction to statistical models. Applications of sampling theorems. Correlation functions and spectra. Shot noise and thermal noise. Introduction to measurements and com-

putational techniques. Nonlinear random processes. Term papers on special problems.

Prerequisite: EE 4220.

5620 [4530]. Digital Image Processing. 3.

Methodologies and algorithms for processing digital images by computer. Includes gray level transformations, histogram analysis, spatial domain filtering, 2D Fourier transforms, frequency domain filtering, image restoration, and reconstruction of computer tomography (CT) medical images. *Prerequisite:* EE 3220 or equivalent background. (Offered fall of even-numbered years)

5625. Spectral Analysis. 3.

Spectral estimation including nonparametric methods such as Welch and Blackman-Tukey; modern parametric methods for AR, MA and ARMA spectra including Yule-Walker and Levinson-Durbin. Parametric line spectral subspace methods including MUSIC and ESPRIT. Filterbank and spatial methods such as beamforming. *Prerequisites:* EE 3220, 4220 or equivalent.

5630. Advanced Image Processing. 3.

Introduces students to advanced aspects of image processing (IP), using specific applications to demonstrate these principles. Concepts such as medical imaging; color IP; wavelets and multiresolution IP; image compression; morphological IP; image segmentation, representation, description and understanding are covered. *Prerequisites:* EE 5620.

5640. Adaptive Filters and Signal Processing. 3.

Adaptive filtering including eigenanalysis, low-rank modeling, Wiener filters, linear prediction, steepest descent methods, least mean-squares and recursive least squares methods, adaptive beamforming. Performance, convergence, and stability issues. Realization techniques. *Prerequisites:* EE 4220.

5650. Object and Pattern Recognition. 3.

Introduces students to both fundamental and advanced aspects of object and pattern recognition, using specific applications to demonstrate these principles. Concepts such as Bayesian, maximum-likelihood, principal components, nonparametric, linear discriminant, multi-layer neural networks, etc., and the trade-offs and appropriateness of classification techniques are covered. *Prerequisite:* EE 4220.

5660. System Identification. 3.

Fundamental and advanced topics in identification of system models from measured data. A variety of model structures are studied such as ARX, ARMAX, and State Space. Both non-parametric and parametric identification techniques are investigated with applications to real world systems and data. Experiment design and model validation are also examined. *Prerequisites:* EE 4220.

5670. Digital Image Formation. 3. This course introduces fundamental aspects of practical digital image formation, using specific applications to demonstrate these principles. Standard CCD and CMOS cameras (both still and video) and standard camera lens systems are assumed. *Prerequisite:* EE 3220 or equivalent background.

5700. Power Engineering. 2-6 (Max. 6). Design of transmission lines and distribution systems. Coordination studies. System stability studies, load distribution and dispatching. System interconnections. Correlation of machines and transmission systems. *Prerequisite:* EE 3510.

5740. Digital Control Systems. 3. Mathematical models of digital control system components; Sample-and-Hold Device, A/D and D/A conversion, Pulse transfer function, Modified Z-transform; Jury's and Routh-Hurwitz test, Bilinear Transformations, Nyquist Criterion, Root Locus; Frequency Domain Techniques (Bode Diagrams, Nichols Charts); Digital Control Design, Observers; DT state space representation; Sampling and Quantization, Aliasing. Design Project. *Prerequisite:* EE 4620.

5770. Non Linear Systems. 3. Time variable parameter systems, approximation methods for small nonlinearities. Phase-plane methods. The second method of Liapunov. Describing function. Optimum switched systems. Adaptive control systems. *Prerequisite:* EE 4620.

5880. Problems In Electrical Engineering. 1-6 (Max. 9). A graduate special topics course in which advanced developments are studied. Section 1 is individual study. Other sections are primarily seminar format in which participants present reports on the subject under study. *Prerequisite:* Prior approval of the instructor is required.

5885. Special Topics in Electrical Engineering. 1-6 (Max 30). Features topics not included in regularly offered classes. Normally offered in regular class lecture format; may include a lab component if appropriate. *Prerequisite:* Prior approval of the instructor is required.

5890. Reliability of Engineering Systems. 3. This course will cover general reliability modeling and evaluation; probability and stochastic processes; system modeling; methods of reliability assessment (state space, frequency balancing, cut-set and tie-set analysis, decomposition, Monte Carlo simulation); and reliability modeling and analysis of electric power systems: bulk power systems, distribution systems, and industrial systems. *Prerequisite:* MATH 2310 with a grade of C or better.

5900. Practicum in College Teaching. 1-3. (Max 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 12). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisites:* enrolled in a graduate degree program.

5980. Dissertation Research. 1-12 (Max. 48). Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisites:* enrolled in a graduate level degree program.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

Bioengineering (BE)

4580. Honors Undergraduate Research. 3. An independent research experience for undergraduate students enrolled in the Engineering Honors Program. Before registering for this class, students are responsible for discussing their interests with faculty, identifying a willing research mentor, obtaining approval by said mentor, and communicating the student/faculty partnership to the appropriate staff in their home department. Must be in the Engineering Honors Program. Cross listed with ATSC/CE/CHE/COSC/ES/ESE/PETE 4580. *Prerequisite:* junior or senior standing.

4810. Bioinstrumentation. 3. Electronic systems used to monitor physiological systems and function (cardiovascular, pulmonary, nervous); transducer systems, amplifiers and recording systems used in research and clinical applications. Laboratory. Dual listed with BE 5810. *Prerequisite:* EE 2210 or similar electric circuit course.

4820. Biomedical Signal Processing. 3. Extraction of signals from noise and data analysis. Emphasis on system modeling of physiological

functions from experimental data. Dual listed with BE 5820. *Prerequisite:* EE 3220, basic course, or equivalent.

5410. Rehabilitation Engineering. 3. This course covers the engineering principles of multiple rehabilitation technologies, including rehabilitation robots, exoskeletons, wearable sensors, electrical stimulators, implants, and virtual reality. Students will learn the technical and biological principles of all of these technologies via lectures, projects, and literature reviews. *Prerequisite:* graduate standing.

5810. Bioinstrumentation. 3. Electronic systems used to monitor physiological systems and function (cardiovascular, pulmonary, nervous); transducer systems, amplifiers and recording systems used in research and clinical applications. Laboratory. Dual listed with BE 4810. *Prerequisite:* EE 2210 or similar electric circuit course.

5820. Biomedical Signal Processing. 3. Extraction of signals from noise and data analysis. Emphasis on system modeling of physiological functions from experimental data. Dual listed with BE 4820. *Prerequisite:* EE 3220, basic course, or equivalent.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

Environmental Engineering

3074/4055 Engineering Building,
766-5255/766-2500

E-mail: ceinfo.uwyo.edu; che-info@uwyo.edu

Web site: www.uwyo.edu/chemical/graduate/prospective/environmental/index.html

A master of science in environmental engineering is available in the College of Engineering through a joint effort of the Department of Civil and Architectural Engineering and the Department of Chemical Engineering and the Department of Petroleum Engineering in cooperation with the School of Environment and Natural Resources. This interdisciplinary degree offers students an engineering perspective for solutions to environmental problems. Emphasis is on minimization, monitoring, control, and processing of waste products as well as treatment and disposal associated with point and non-point pollution sources. Integration of engineering with science, regulatory, and policy aspects of environmental engineering is an important component of this unique program. Further

information is available from the environmental engineering graduate studies program office and/or departments involved.

Program Specific Admission Requirements

Admission is open to students with at least a bachelor's degree who meet the minimum requirements:

1. A GPA of 3.000 (A=4.000), or equivalent;
2. A GRE score of 291 (combined verbal and quantitative sections);
3. For international applicants who did not attend an English-speaking program in an English-speaking country for all years of their highest degree: A TOEFL score of 76 (Internet based) or an IELTS score of 6.0.

Complete official transcripts of all prior college-level coursework and recommendations from three references must be submitted as parts of the application.

The deadline to submit application credentials is February 1 (to be considered for fall semester), and October 1 (to be considered for spring semester).

The application will not be processed until all the necessary documents have been submitted.

Program Specific Degree Requirements

All Environmental Engineering M.S. students must take the following Core courses (9 hrs):

1. Environmental Engineering Microbiology (ENVE 5425)
2. Environmental Engineering Chemistry (ENVE 5430)
3. Environmental Transport Processes (CE 5435)

Students should also take at least one of the following Recommended courses (3 hrs):

1. Advanced Biological Wastewater Treatment (ENVE 5410)
2. Advanced Physical Chemical Treatment (ENVE 5450)

Plan A (Thesis) students complete another 14 hours of Approved Elective coursework, at least 4 hours of Thesis Research (ENVE 5960), and write and defend their thesis. Plan B (Project) students complete another 18 hours of Approved Elective coursework and write and present their project.

Early in the program, the student must submit a program of study listing coursework for approval by the departmental graduate studies committee, the department head, and subsequently, the Office of the Registrar.

Environmental Engineering (ENVE)

5410. Advanced Biological Wastewater Treatment. 3. Theory and practice of advanced biological treatment processes for municipal and industrial wastewaters, sludges, groundwater bioremediation and solid waste. Emphasis is on fundamental principles applied to the design and control of existing processes and the development of innovative systems. Cross listed with CE/CHE 5410. *Prerequisite:* consent of instructor.

5430. Environmental Engineering Chemistry. 3. Focus includes inorganic, organic, physical, equilibrium, biochemistry, colloidal and nuclear chemistry with an emphasis on the problems/solutions encountered by environmental and civil engineers. *Prerequisite:* CHEM 1020.

5445. Hazardous Waste Site Remediation. 3. The contamination of soil, air, and groundwater by improper disposal of hazardous wastes is covered. Control and cleanup of contaminated groundwater plumes, treatment of polluted soils and soil gases is emphasized. Case studies are extensively used. Cross listed with CE 5445. *Prerequisite:* CE 3400.

5450. Advanced Physical Chemical Treatment. 3. A study of physical and chemical processes for treatment of water, and waste water. Cross listed with CE 5450. *Prerequisite:* CE 4400.

5885. Problems. 1-3 (Max. 6). Special course designed to make possible individual investigation of problems of environmental engineering selected to fit student's educational research needs. *Prerequisite:* consent of instructor.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

Department of Mechanical Engineering

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Department Head: Carl P. Frick

Professors:

DENNIS N. COON, B.S. Alfred University-New York; M.S. 1984; Ph.D. Pennsylvania State University 1986; Professor of Mechanical Engineering 1999, 1988.

CARL P. FRICK, B.S. University of Colorado at Boulder 1999; M.S. 2003; Ph.D. 2005; Professor of Mechanical Engineering 2019, 2008; Head of Mechanical Engineering 2015.

DIMITRI J. MAVRIPLIS, B.S. McGill University 1982; M.Eng. 1982; Ph.D. Princeton University 1987; Professor of Mechanical Engineering 2003.

JONATHAN W. NAUGHTON, B.S. Cornell University 1986; Ph.D. Pennsylvania State University 1993; Professor of Mechanical Engineering 2012, 1997.

Associate Professors:

ERICAL. BELMONT, B.S. Tufts University 2004; M.S. 2008; Ph.D. University of Texas at Austin 2014; Associate Professor of Mechanical Engineering 2020.

RAY S. FERTIG III, B.S. University of Wyoming 2001; M.S. 2003; Ph.D. Cornell University 2010; Associate Professor of Mechanical Engineering 2017, 2011.

MICHAEL STOELLINGER, M.S. Technical University Munich 2005; Ph.D. University of Wyoming 2010; Associate Professor of Mechanical Engineering 2018, 2012.

Assistant Professors:

DILPUNEET S. AIDHY, B.E. Punjab Engineering College 2004; Ph.D. University of Florida 2009; Assistant Professor of Mechanical Engineering 2015.

YANG LIU, B.S. Chongqing University; M.S. Zhejiang University; Ph.D. Pennsylvania State University 2014; Assistant Professor of Mechanical Engineering 2018.

MAYSAM MOUSAVIRAAD, B.S. Sharif University of Technology 2002; M.S. 2004; Ph.D. University of Iowa 2010; Assistant Professor of Mechanical Engineering 2017.

XIANG ZHANG, B.S. Northeastern University (China) 2009; M.S. Beihang University (China) 2012; Ph.D. Vanderbilt University 2017; Assistant Professor of Mechanical Engineering 2019.

Professors Emeriti:

Donald F. Adams, Paul A. Dellenback, Bruce R. Dewey, Andrew Hansen, William R. Lindberg, Kynric M. Pell, Ovid A. Plumb, Donald A. Smith, David E. Walrath, Robert A. Wheasler

Mechanical Engineering is the broadest area of study in engineering. In contrast to other engineering disciplines, mechanical engineers are employed in significant percentages in almost all industrial and governmental organizations that employ engineers.

The spectrum of activities in which mechanical engineers are engaged continues to expand. The curriculum has in turn become flexible to allow for the education of mechanical engineering students in many diverse and allied areas, or for graduate school preparation.

The educational objectives of the Department of Mechanical Engineering are as follows:

- Successfully practice the profession of engineering
- Demonstrate career growth (e.g. increasing complexity of job assignment, career promotions, professional registration, patents, publications, and completion of advanced degrees)

The undergraduate program includes a foundation in mathematics, science, and engineering sciences. The three key elements of the mechanical engineering undergraduate program include core engineering principles, laboratory experience, and development of communication skills.

The mechanical engineering curriculum affords the student the flexibility to pursue specific professional goals within the discipline. Such an opportunity needs to be carefully considered by each student, so that elective courses are chosen with these goals in mind. During the junior and senior years, the student selects 15 credit hours of technical electives.

Mechanical and Energy Systems Engineering degree candidates must meet the academic requirements of the college and in addition must have an average GPA of 2.000 (C) in Mechanical and/or Energy Systems engineering courses completed at this university. A grade of C or better must be earned in all engineering science (ES) and required mathematics courses.

Mechanical Engineering Success Curriculum

All undergraduate students in the B.S. Mechanical Engineering and B.S. Energy Systems Engineering programs must successfully complete the Mechanical Engineering Success Curriculum prior to enrolling in any upper-division (3000-level or above) courses taught by the Mechanical Engineering Department. The Mechanical Engineering Success Curriculum promotes successful completion of upper-division coursework by assuring a student that their foundational knowledge and skills are strong in mathematics and engineering fundamentals. To successfully complete the Mechanical Engineering Success Curriculum, a student must earn a minimum 3.000 GPA in the following 10 courses: MATH 2200, MATH 2205, MATH 2210, ES 1060, ES 2110, ES 2120, ES 2210, ES 2310, ES 2330, and ES 2410. AP/iB courses are excluded from the GPA calculation, but grades transferred from other institutions will be used in evaluating the ME Success Curriculum GPA.

Policy for Transfer Credit Towards Mechanical Engineering (ME) Core Coursework

In general, transfer of coursework towards a Mechanical Engineering degree will follow University of Wyoming policy. Courses must be shown to be equivalent to its University of Wyoming course (latitude may be given for Mechanical Engineering electives without a direct University of Wyoming equivalent). However, six courses are considered to be the core of the Mechanical Engineering program, and therefore credit cannot be transferred from another institution. These courses are ME 3010, ME 3020, ME 3040, ME 3170, ME 3360, and ME 3450. Exceptions may be made for courses from approved study abroad programs or in extreme circumstances. Please note that failing a prerequisite course resulting in a delay of graduation does not constitute an extreme circumstance. Any transfer of ME courses requires explicit written approval from the Department.

Dual ME/ESE Degrees

In the event that a student desires to double major in ME and ESE, University policy requires that 30 credit hours past the first degree are required to earn the second degree, and college policy dictates that 24 of these credit hours must be technical coursework approved by the Department while up to 6 hours can be any student-chosen electives.

Mechanical Engineering Curriculum

Chemistry	Hrs.
CHEM 1020: Gen Chem 1.....	4
Engineering Science	
ES 1060: Intro Eng Prob Solv	3
ES 2110: Statics	3
ES 2120: Dynamics	3
ES 2210: Elec Circuit Analysis.....	3
ES 2310: Thermodynamics.....	3
ES 2330: Fluid Dynamics	3
ES 2410: Mech of Materials.....	3
ES 2800 (EE 2800).....	3
Math	
MATH 2200: Calculus 1	4
MATH 2205: Calculus 2	4
MATH 2210: Calculus 3.....	4
MATH 2310: Appl. Diff. Eqns.....	3
Mechanical Engineering	
ME 3005: Engineering Experimentation	3
ME 3010: Intermediate Mechanics of Materials	3
ME 3020: System Dynamics	3
ME 3040: Thermodynamics II.....	3
ME 3060: Numerical Methods for Engineers	3
ME 3160: Thermal/Fluid Science Lab	3
ME 3170: Machine Design	3
ME 3360: Fundamentals of Transport Phenomena	3
ME 3450: Properties of Materials	3
ME 4060: Systems Design I	3
ME 4070: Systems Design II.....	3
ME 4150: Mechanical Behavior of Materials	3
Physics	
PHYS 1220: Phys. Engineering Physics II...4	
PHYS 2310: Phys III or PHYS 2320: Phys IV or CHEM 1030: Gen Chem II (min 3 CH)	
Electives	
Four ME Electives (min 12 CH total, any upper division ME course or EE 4620)	
Two Math/Science Electives (min 6 CH total, select from department-approved list)	
One Business Elective (min 3 CH, select from department-approved list)	
One Technical Elective (min 3 CH, any engineering, math/science or business course approved by the ME Dept)	
(See here for Math, Science and Business Elective options: http://www.uwyo.edu/ceas/academics/advising/_files/advfiles/me_math_science_business_electives.pdf)	

Notes:

* not part of MES

i) Before enrolling in any upper division ESE or ME course, students must complete the ME Success Curriculum (3.000 GPA in MATH 2200, MATH 2250, MATH 2210, and the seven ES courses).

ii) Graduates must meet all college requirements and earn a minimum GPA of 2.000 in ME courses taken at UW. A minimum of 48 hours are required, so ME, business, and technical electives should be chosen appropriately.

Graduate Study

The Department of Mechanical Engineering offers graduate study leading to the Master of Science (M.S.) and Doctor of Philosophy (Ph.D.) degrees in Mechanical Engineering. Faculty in Mechanical Engineering conduct research in the areas of aerodynamics, biomaterials, composite materials, computational material science, computational fluid dynamics, combustion, continuum mechanics, heat transfer, materials reliability, mechanical behavior of materials, nanomechanics of surfaces and interfaces, and wind energy.

Department Specific Admission Requirements

Applicants should possess a Bachelor of Science (B.S.) degree or equivalent in Mechanical Engineering with a minimum GPA of 3.000 on a 4.000 grade scale or equivalent. Students that do not hold B.S.M.E. degrees may qualify as M.S. candidates by completing, without credit, certain prerequisite courses as specified by the Department. These prerequisites would depend upon the candidate's background and upon the area in which he/she plans to specialize.

In addition to the required application materials (i.e. application form, academic transcript, GRE, TOFEL, or IELTS scores, letters of reference) the applicant must submit a Statement of Purpose indicating their technical area of interest, abilities, and objectives in completing a graduate degree in mechanical engineering.

A minimum composite score of 294 (MS) or 307 (PhD) on the Verbal and Quantitative sections of the GRE is typically required for full admission to the Mechanical Engineering Department. For international students, a minimum TOEFL score of 577 on the written exam or 90 on the Internet-based test (iBT) TOEFL (or a minimum IELTS score of 6.5). Admittance to the graduate program is competitive, and the average applicant that is accepted will likely have well above the minimum qualifications.

Program Specific Degree Requirements

Master of Science (M.S.) Program

The Mechanical Engineering Department offers both a thesis (Plan A) and a non-thesis (Plan B) M.S. program. No graduate credit is allowed for 4000-level mechanical engineering courses.

Plan A (thesis)

A thesis project is chosen in consultation with an ME faculty member, and constitutes 4 credit hours of ME 5960 of the 30-hour Plan A program. ME 5478 (Seminar) is to be taken during the final semester when the thesis is presented and defended, and constitutes 2 credit hours of the 30-hour Plan A program. Classes must meet the following constraints:

- ME courses (5000-level): minimum of 15 hours
- A maximum of 9 credits at the 4000 level outside of ME may be taken
- Thesis research (ME 5960): 4 credit hours
- Seminar (ME5478): 2 credit hours
- Total: minimum of 30 hour

Plan B (non-thesis)

The Plan B M.S. degree can be completed by earning a minimum of 31 credits beyond the baccalaureate degree. Classes must meet the following constraints:

- ME courses (5000-level); minimum of 15 hours
- A maximum of 9 credits at the 4000 level outside of ME may be taken
- Graduate Project (ME 5961); minimum of 1 hour
- Total: minimum of 31 hours

Courses outside of ME must be chosen with the approval of the academic adviser. They can be in mathematics, statistics, science, or other engineering disciplines. Up to two courses may be from the fields of business, ENR, or public policy. Special topic credits may be earned using ME 5475 (maximum of 6 credits). Research credits earned through ME 5960 as part of an unfinished M.S. Plan A program may not be counted. Although the Plan B M.S. degree is not research-oriented, the program must contain an "element of discovery," documented by completing ME 5961 (Graduate Project). This could be a special project performed as independent study or as part of a graduate course.

Quick Start BS/MS Program

Through judicious choice of undergraduate electives, this program allows double-counting up to two 5000-level courses from the B.S. program toward M.S. degree requirements, thus reducing the time requirement for completing an M.S. degree. Students can apply for admission to the B.S./M.S. program by achieving junior status and meeting the following requirements for admission:

- completion of the four core ME courses (ME 3010, ME 3020, ME 3040, and ME 3360),
- a minimum overall GPA of 3.250,
- a minimum GPA of 3.250 in ME courses, and
- a minimum of three letters of recommendation (at least two must be from ME faculty at UW).
- Contact Department for application process.

Students must maintain a GPA of at least 3.250 in their undergraduate and at least 3.000 in their graduate coursework in order to remain in good standing in the program. Not meeting the GPA requirement places a student on probation for one semester. If the GPA requirement is not met after that semester, the student will be dismissed from the Quick Start program. Transfer students must have taken courses equivalent to the ME core courses. Transfer students must have also completed at least 15 credit hours of courses at UW in order to be eligible for admission.

Until a student in this program has completed a total of 131 credit hours of courses applicable to the BS or MS degree in Mechanical Engineering, he/she will be governed by the regulations applicable to undergraduate students in the Department. After a student has accumulated a total of 131 applicable credit hours, he/she will be governed by the regulations applicable to any graduate student in the ME department. These regulations include the requirement that every student must take the GRE general examination. It is the intention of the department that, to the degree possible, a student in this program is treated on the same basis as any other student in the department at a comparable stage of his/her academic career.

With the recommendation of the student's academic advisor and the approval of the ME Graduate Affairs Committee, as many as 6 credit hours of ME department courses at the 5000 level may be counted towards both the undergraduate degree requirements and the requirements for the MS degree. In principle, therefore, the minimum number of course

credit hours required for the BS/MS degrees will be 151 (for Plan A students + 4 additional hours of thesis research) or 156 (for Plan B students - non-thesis option).

Doctoral Program

For students of outstanding academic ability and with demonstrated capacity for undertaking independent research on advanced engineering problems, the Ph.D. program in mechanical engineering is offered. The Ph.D. requires a minimum of 72 graduate hours, at least 42 of which must be earned in formal coursework. A minimum of 24 in-resident coursework hours is required. No graduate credit is allowed for 4000-level mechanical engineering courses and a maximum of 9 credits at the 4000-level outside of ME may be taken. A minimum of 15 credit hours must be taken from ME courses (5000-level).

In addition to coursework requirements, graduate students pursuing a Ph.D. in Mechanical Engineering must complete three examinations: Qualifying, Preliminary, and Final. In consultation with their advisor, students are allowed to take the Qualifying Exam after declaring pursuit of a Ph.D. degree. Graduate students do not require a M.S. to take the Qualifying Exam. The format is a knowledge-based examination consisting of three subject areas, each with both a written and an oral component. The candidate will be evaluated for each subject area, based on the cumulative performance in both (written and oral) components. Should the student fail a single subject area, at the discretion of the committee, they may repeat the failed portion at the next available opportunity. A third attempt is not permitted. The successful completion of the Qualifying Exam is required before the Preliminary Exam. The purpose of the Preliminary Exam is to evaluate the aptitude of the Ph.D. candidate to perform research based on preliminary results, and to assess the student's plan for completing the research necessary for the Final Exam. The Preliminary Exam follows university regulations and, at a minimum, consists of a seminar attended by the student's committee members. The purpose of the Final Exam is to ensure the Ph.D. candidate has sufficient accomplishments to be awarded a Ph.D. The Final Exam consists of an oral defense of the dissertation in accordance with university policy.

All graduate students in Mechanical Engineering are expected to follow the graduate education policies of the College of Engineering and Applied Sciences.

Mechanical Engineering (ME)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB↔Q]).

3005 [2010; 2020]. Engineering Experimentation. 3. A combined lecture/laboratory course introducing students to experimental methods in the context of dynamics. Written technical communication, intermediate structured programming, experimental design, fundamental statistics, and uncertainty methods (numerical and analytical) are emphasized. Collaborative writing and teamwork is introduced. Cross listed with ESE 3005. *Prerequisites:* Completion of the ME Success Curriculum, ES 1060, ES 2120.

3010. Intermediate Mechanics of Materials. 3. Expansion of the principles of solid mechanics: stress, strain, principal stresses, elastic and plastic behavior, failure theories and the use of energy methods. Analysis and design of thick-walled pressure vessels, noncircular cross sections under torsion, nonsymmetric beams under bending and curved beams. *Prerequisite:* Completion of the ME Success Curriculum, ES 2410.

3020. System Dynamics. 3. Theoretical and experimental study of the dynamics of linear and non-linear lumped parameter models of mechanical, electrical, electronic, fluid, thermal and mixed systems. Cross listed with ESE 3020. *Prerequisites:* Completion of the ME Success Curriculum, ES 2210 and MATH 2310. (Normally offered fall semester)

3040. Thermodynamics II. 3. Consideration of advanced thermodynamic topics including Maxwell's relations, compressible flow, and combustion. Applications to design of refrigeration cycles, humidification systems, and Rankine cycles. Cross listed with ESE 3040. *Prerequisite:* Completion of the ME Success Curriculum, CHEM 1020 and ES 2310. (Normally offered fall semester)

3060. Numerical Methods for Engineers. 3. Numerical solutions of problems commonly encountered in mechanical engineering including differentiation, integration, differential equations, system of linear and nonlinear equations, and optimization. The structured programming approach will be emphasized and applications from solid mechanics, thermal fluid sciences, materials science, and dynamic systems will be covered. Cross listed with ESE 3060. *Prerequisites:* Completion of the ME Success Curriculum, ES 1060, and MATH 2310 or concurrent enrollment.

3160 [2140; 2160]. Thermal/Fluid Science Lab. 3. A laboratory course to introduce students to experimental methods for temperature measure and pressure/flow characteristics of fluids. Continuation of experience with communication (written, oral, and digital), intermediate programming, experimental design, data analysis, and teamwork skills is emphasized. Cross listed with ESE 3160. *Prerequisites:* Completion of the ME Success Curriculum, ES 2330; ME/ESE 3005.

3170. Machine Design. 3. Application of engineering mechanics and materials science to the analysis and design of mechanical components such as bolted connections, springs, gears, bearings and shafts. Design for dynamic loading conditions. Principles of hydrodynamic lubrication. Introduction to computer-aided design. Case studies with appropriate topics. *Prerequisite:* Completion of the ME Success Curriculum, ES 2410. (Normally offered spring semester)

3360 [ES 3360, ES 4360]. Fundamentals of Transport Phenomena. 3. Basic concepts of heat and mass transfer and their applications to problems involving engineering analysis and design. Topics include steady-state and transient conduction, free and forced convection (heat and mass), radiation and heat exchangers. Cross listed with ARE/ESE 3360. *Prerequisites:* Completion of the ME Success Curriculum, MATH 2310, ES 2310, and ES 2330.

3400. Heating, Ventilating and Air Conditioning of Buildings. 3. Qualitative and quantitative study in concepts of basic air-conditioning with focus on buildings including building envelope, moist air thermodynamics, human comfort, thermal load calculations, thermal behavior of buildings, HVAC systems/equipment, and design of space air-conditioning and its relationship to architectural design. Cross listed with ARE 3400. *Prerequisites:* ES 2310, ARE 2410 or ME 3360, ES 2330 or concurrent enrollment.

3450 [ES 3450]. Properties of Materials. 3. Mechanical, electrical, thermal and chemical properties of materials. Theoretical treatment of structure of solids and design for specified properties. *Prerequisite:* Completion of the ME Success Curriculum, CHEM 1020 and ES 2310. (Normally offered spring semester)

3975. Internship. 3. Students may apply for credit for extended work experience (>10 weeks; full-time) engaging in mechanical engineering work and supervised by an engineer in mechanical engineering (or closely related field). Students should apply through their adviser prior to the work experience. Enrollment

is by departmental approval only. Satisfactory/Unsatisfactory only. *Prerequisite:* consent of the department head.

4010. Mechanical Vibrations. 3. The theory of single and multi-degree-of-freedom systems with an introduction to continuous systems. Determination of equations of motion, including natural frequency for free vibration and amplitude of forced vibration. Design of discrete and continuous systems for transient and harmonic excitations. *Prerequisites:* Completion of the ME Success Curriculum, ES 2120, ES 2410, and MATH 2310. (Normally offered fall semester)

4020. Design of Mechanical/Electronic Systems. 3. Theoretical and experimental study of sensors and actuators, interfacing sensors and actuators to a microcomputer, discrete and continuous controller design, analog and digital electronics, and real-time programming for control. *Prerequisites:* Completion of the ME Success Curriculum, ME 3020. (Normally offered spring semester)

4040. Introduction to Finite Elements. 3. An introduction to the theory and application of finite elements to the solution of various problems with emphasis on structural mechanics. The course includes development of the underlying matrix equations, the treatment of element generation and properties, and implementation of boundary conditions. Dual listed with ME 5040. *Prerequisites:* Completion of the ME Success Curriculum, MATH 2310 and (CE/ARE 4200 or MATH 2250 or ME 3010 or ME 3060).

4060 [3070]. Systems Design I. 3. First of a two-course design sequence constituting a capstone design experience. Student multidisciplinary teams prepare a project proposal or SOQ, generate a morphological study of their project and prepare project plans and specifications. Project management methods are also presented. *Prerequisites:* Completion of the ME Success Curriculum, ME 3010 (or concurrent enrollment), ME 3170, and ME/ESE/ARE 3360. (Normally offered fall semester)

4070. Systems Design II. 3. [WC♦(none)] Continuation of a two-course design sequence. The design teams refine their designs, fabricate the project, test the project for compliance with the design specifications, write a comprehensive engineering design report including socioeconomic factors, and prepare and deliver a presentation of the project in a public forum. *Prerequisites:* Completion of the ME Success Curriculum, ME/ESE 4060 and WB. (Normally offered spring semester)

4100. Manufacturing Processes. 3. Details of manufacturing processes used in production of metal, plastic and ceramic components with an emphasis on science and mechanics of processes. *Prerequisites:* Completion of the ME Success Curriculum, ME 3010 and ME 3450.

4150. Mechanical Behavior of Materials. 3. Commonly encountered phenomenological and mechanistic behaviors that lead to mechanical failure are examined. Understanding the origin of mechanical failure of components allows for robust design of mechanical systems. Metallic, polymeric, and ceramic materials are covered. *Prerequisite:* Completion of the ME Success Curriculum, ME 3450.

4200. Thermo/Kinetics of Materials. 3. Introduction to the foundations of thermodynamics and kinetics of materials, including Gibbs free energy, ideal solutions, alloy ordering, phase diagrams, atomistic mechanisms of diffusion, interfaces and microstructure, grain growth, solidification, and diffusional and diffusionless transformation in solids. Dual listed with ME 5200. *Prerequisite:* ME 3450.

4210. Introduction to Composite Materials. 3. Applications, mechanical properties and fabrication of fiber reinforced composite materials; stress analysis of laminated, anisotropic composite structures; study of special problems unique to composites. *Prerequisite:* Completion of the ME Success Curriculum, ME 3010. (Normally offered fall semester)

4215. Composite Materials Design and Manufacturing. 3. Introduction to composite material manufacturing processes. Aspects of constituent material production, as well as design, fabrication, and testing of composite materials. Laboratory exercises, such as laminating, filament winding, pultrusion and compression molding. *Prerequisite:* Completion of the ME Success Curriculum, ME 4210. (Normally offered spring semester)

4240. Gas Dynamics I. 3. Thermodynamics of a compressible fluid; one-dimensional isentropic flow, normal and oblique shocks, expansion wave, flows with friction and heat transfer. *Prerequisites:* Completion of the ME Success Curriculum, ES 2310 and 2330.

4330. Internal Combustion Engines. 3. Thermodynamic analysis and design of Otto and Diesel cycles for vehicle applications and stationary power generation. A substantial laboratory component will examine design and manufacturing issues, as well as engine performance in a variety of scenarios. Cross listed with ESE 4330. *Prerequisites:* Completion of the ME Success Curriculum, ME/ESE 3040 and ME/ARE/ESE 3360.

4340. Gas Turbine Engines. 3. Thermodynamic analysis and design of ground-based and aero-propulsion gas turbine engines. *Prerequisites:* Completion of the ME Success Curriculum, ES 2310 and 2330. (Normally offered spring semester)

4350. Airplane Aerodynamics and Flight. 3. Introduces students to the fundamentals of airfoil and wing design, airplane aerodynamics, and airplane stability. Links these fundamental ideas to the design and performance of real aircraft. *Prerequisites:* Completion of the ME Success Curriculum, ES 2330. (Normally offered spring semester)

4430. HVAC Systems Analysis and Design. 3. Engineering design and performance analysis procedures for commercial building mechanical systems including energy conservation techniques. Relationship to aesthetic, architectural and structural elements are considered. Cross listed with ARE 4430. *Prerequisites:* ARE/ME 3400 and ARE/ME 3360 or concurrent. (Normally offered alternate spring semesters)

4450 [3110]. Principles of Materials Selection. 3. A review of the economic and engineering aspects of materials selection. A detailed study of the properties, applications and limitations of engineering materials systems. Emphasis is on metal alloy systems, but non-metallics are included. Forming and joining processes are outlined. *Prerequisite:* Completion of the ME Success Curriculum, ME 3450. (Normally offered spring semester)

4455. Combustion Engineering. 3. The basic physics and chemistry of combustion engineering and its applications are covered, including thermodynamics, chemical kinetics, multicomponent conservation equations, laminar premixed and nonpremixed flames, detonations, droplet combustion, modern engines and energy systems. Cross-listed with ME 5455 and dual-listed with ESE 4455. *Prerequisite:* Completion of the ME Success Curriculum, ME/ESE 3040 and ME/ARE/ESE 3360.

4460. Solar and Geothermal Engineering. 3. An introduction to the engineering of solar-powered energy systems, including evaluation of the energy resource, passive design considerations, economics of active solar systems, design of flat plate collectors and water heating systems, and design of concentrating collectors for larger building or electrical generation applications. Design considerations for geothermal energy systems for both small-scale and commercial-scale applications. Cross listed with ESE 4460. *Prerequisite:* Completion of the ME Success Curriculum, ESE 3360 or ME 3360 or ARE 3360.

4470. Wind and Ocean Energy Engineering. 3. Introduction to the harvesting of wind and ocean energy, including discussions of the wind resource, wind turbine aerodynamics, blade materials, turbine dynamics, electrical systems, control systems, and energy storage. An overview of ocean energy capture systems is also presented. Cross listed with ESE 4470.

Prerequisites: Completion of the ME Success Curriculum, ES 2210, ES 2310, ES 2330, and ES 2410.

4474. Topics in Mechanical Engineering I. 1-3 (Max. 6). Directed research in mechanical engineering. *Prerequisite:* Completion of the ME Success Curriculum, junior standing in engineering.

4480. Building Air and Hydronic Systems. 3. Design and analysis of building air and hydronic systems with focus on the application, design and analysis of thermal energy distribution systems (air and hydronic systems) for building space air conditioning. Requires enrollment in associated laboratory session.

Prerequisite: Completion of the ME Success Curriculum, ARE/ME 4430 with a grade of C or above.

4490. Modeling and Optimization of Energy Systems. 3. Application of principles of thermodynamics, fluids, and heat and mass transfer in the component and system-level design of energy/thermal systems, including modeling, simulation and optimization techniques. Examples are drawn from building environmental control, energy conversion and thermal industrial processes. Students work on projects for integration of these components in the design of energy/thermal systems. Requires enrollment in associated laboratory session. Cross listed with ARE 4490. *Prerequisites:* Completion of the ME Success Curriculum, ARE/ME 3360 and 3400.

5040. Introduction to Finite Element Analysis. 3. An introduction to the theory and application of finite elements to the solution of various problems with emphasis on structural mechanics. Includes development of the underlying matrix equations, the treatment of element generation and properties, and implementation of boundary conditions. Dual listed with ME 4040. *Prerequisites:* MATH 2310 and (CE 4200 or ARE 4200 or ME 3010).

5045. Advanced Finite Element Analysis. 3. Advanced topics in finite element analysis with emphasis on mathematical foundations of the method, numerical algorithms for software implementation, and analysis of problems with material and geometric nonlinear behavior. Cross listed with CE 5045. *Prerequisite:* ME 4040 or ME 5040 or CE 5040.

5200. Thermo/Kinetics of Materials. 3. Introduction to the foundations of thermodynamics and kinetics of materials, including Gibbs free energy, ideal solutions, alloy ordering, phase diagrams, atomistic mechanisms of diffusion, interfaces and microstructure, grain growth, solidification, and diffusional and diffusionless transformation in solids. Dual listed with ME 4200. *Prerequisite:* ME 3450.

5422. Advanced Vibrations. 3. Advanced principles of dynamics: Hamilton's principle, Lagrange's equations, modal analysis of discrete systems. Analysis of continuous systems; natural modes, approximate methods, forced vibration. Introduction to random vibration. *Prerequisite:* ME 4010.

5431. Analysis of Composite Materials. 3. An introduction to the methods of analysis applied to heterogeneous material systems. Emphasis of this course is on stress based formulations and failure analysis of fiber reinforced materials including laminates. *Prerequisite:* graduate standing.

5432. Advanced Materials Science. 3. An analysis of the relationships between the structures of materials and their mechanical and physical properties, leading to the application of these relationships to the design of materials for advanced engineering systems. Topics include crystallography, lattice defects, transport phenomena, phase transformations, fracture, environmental effects, and control of microstructure by processing. *Prerequisites:* ME 3450.

5434. Computational Materials Science. 3. Fundamentals of quantum and statistical physics with application to modeling and simulation of engineering materials at the atomic scale. Course includes simulation of structural and mechanical properties of nanostructured materials. *Prerequisite:* graduate standing.

5435. Failure of Engineering Materials. 3. Introduction to failure of common engineering materials. Considers both experimental and analytical techniques for failure analysis and prevention. Topics include overload, fracture mechanics, fatigue, environmentally assisted fatigue, and creep. *Prerequisite:* ME 3450 or equivalent.

5438. Plasticity and Viscoelasticity. 3. Analysis of stress and deformation of idealized plastic and viscoelastic solids. Limit theorems in plasticity. Time-dependent behavior of viscoelastic materials. *Prerequisite:* ME 5472 or equivalent.

5440. Fluid Mechanics. 3. Lagrangian and Eulerian descriptions, conservation laws, stress and rate-of-stress tensors, Navier-Stokes equations, energy equations, vorticity and circulation inviscid and potential flows, laminar flows, turbulent flows, boundary-layer theory. Cross listed with CHE 5440.

5442. Advanced Fluid Mechanics. 3. Introduction to inviscid and viscous hydrodynamic stability; closure in turbulent flows; vorticity and vortex dynamics, theoretical aerodynamics, numerical simulations of viscous flows, experimental methods in fluid flows. *Prerequisite:* ME 5440.

5444. Optical Diagnostics in the Thermal and Fluid Sciences. 3. An introduction to optical measurement schemes used in gas and liquid flows. Topics include a review of relevant optical principles and lasers, and in-depth coverage of laser velocimetry, droplet and particle sizing, and temperature measurement. *Prerequisite:* graduate standing.

5446. Turbulence. 3. Basic notions, properties and scales in turbulent flows. Transport equations; Reynold's stresses, mixing and phenomenological theories. Turbulence dynamics; mean and fluctuating kinetic energy balances, vorticity and temperature fluctuations. Statistical description of turbulence; correlations and spectra, transport, isotropy and homogeneity. Shear flows; plane jets, wakes and boundary layers (including planetary). Turbulent diffusion. Cross listed with CHE 5446. *Prerequisite:* ME 5440.

5448. Experimental Fluid Dynamics. 3. Provides an introduction to the design of fluid dynamics experiments. Specific instrumentation will be discussed and methods of analyzing and assessing data will be presented. *Prerequisites:* graduate standing.

5452. Convection Heat Transfer. 3. Convection, including heat and momentum transfer. Boundary layer theory. Laminar and turbulent flows, steady and unsteady formulations including differential and integral descriptions. High velocity, compressible systems. Cross listed with CHE 5452. *Prerequisite:* ES 3360 or consent of instructor.

5455. Combustion Engineering. 3. The basic physics and chemistry of combustion engineering and its applications are covered, including thermodynamics, chemical kinetics, multicomponent conservation equations, laminar premixed and nonpremixed flames, detonations, droplet combustion, modern engines and energy systems. Cross-listed with ME 4455 and dual-listed with ESE 4455. *Prerequisite:* Completion of the ME Success Curriculum, ME/ESE 3040 and ME/ARE/ESE 3360.

5461. Computational Fluid Dynamics I. 3. An introduction to the fundamental techniques and theory of computational fluid dynamics. Topics include discretization methods (finite difference, finite volume, and finite element methods), numerical stability, consistency and convergence, and solution techniques such as explicit, implicit and multigrid methods. The emphasis will be on modern techniques for compressible flows. *Prerequisite:* MATH 5310 or equivalent.

5462. Computational Fluid Dynamics II. 3. A study of advanced techniques in modern-day scientific computing as applied to Computational Fluid Dynamics. These include unstructured mesh generation using Delaunay triangulation, searching and sorting techniques, and efficient data structures. Other topics cover efficient hardware implementation including cache-effects and parallel computing and sensitivity analysis for design optimization. *Prerequisite:* ME 5461.

5472. Continuum Mechanics. 3. The basic laws of the physical behavior of continuous media. Stress and deformation at a point; fundamental equations of balance of mass, momentum, and energy; second law of thermodynamics; curvilinear coordinate analysis. Applications to linear elasticity and fluid mechanics. *Prerequisite:* graduate standing.

5474. Energy Methods. 3. Introduction to variational calculus with applications in solid mechanics. The basic theorems of virtual work, minimum potential energy, and complementary energy are developed. Direct methods such as Castigliano's theorem as well as the approximate methods of Ritz and Galerkin are developed and used to obtain solutions for a variety of problems in solid mechanics. *Prerequisite:* ME 3010.

5475. Topics in Mechanical Engineering II. 1-6 (Max 6). Directed research in mechanical engineering. *Prerequisite:* senior or graduate standing in engineering.

5478. Seminar in Mechanical Engineer. 2. *Prerequisite:* graduate standing in engineering.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Students are expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5961. Graduate Projects. 1-4 (Max. 4). Limited to those students enrolled in a Plan B graduate program. Students should be involved in non-course scholarly activities in support of their Plan B project. *Prerequisites:* enrollment in Plan B program and have departmental approval.

5980. Dissertation Research. 1-12 (Max. 48). Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate level degree program.

Energy Systems Engineering

Energy Systems Engineering is an ABET-accredited undergraduate degree offering by the Department of Mechanical Engineering. The ESE program was designed to train engineers to address one of this country's foremost challenges: to achieve energy independence and yet meet the growing demand for energy, while at the same time addressing critical environmental concerns. The program is intended to help meet these challenges by preparing students to be:

- technology leaders in energy conversion and environmental protection systems
- capable managers in the energy industry
- versatile overseers of energy development by the governmental sector
- technically-trained and environmentally-sensitive liaisons between the energy industry and the public.

ESE students will be trained in alternative and environmentally-friendly energy conversion systems, as well as more traditional technologies that will continue to play an important role for the foreseeable future.

Although the discipline of mechanical engineering has historically been responsible for the design of energy conversion cycles and equipment, issues outside the conventional

realms of engineering are increasingly important to address as new and improved energy conversion systems are implemented. The engineer trained in Energy Systems will be better equipped than traditional mechanical engineers to deal with the environmental, legal, political, economic, and permitting aspects of new energy projects.

The ESE degree has many course work requirements in common with the Mechanical Engineering degree, particularly in the thermal, fluids, and energy conversion sciences. However, the ESE program emphasizes energy conversion aspects of Mechanical Engineering and requires course work from UW's School of Environment and Natural Resources (SENR), course work in environmental law, and two electives picked from a list of classes that focus attention on energy and the environment. The SENR courses expose students to issues related to permitting such as preparation of environmental impact studies, and related regulations such as the Endangered Species Act. In addition, there are four technical electives that allow students to choose more detailed study in personal areas of interest including, for example, courses in environmental engineering, wind engineering, solar engineering, nuclear engineering, and petroleum engineering.

The educational objectives of the ESE program are the same as those listed for the ME program. Energy Systems Engineering degree candidates must meet the academic requirements of the College and must have a minimum GPA of 2.000 (C) in ESE and ME course work. An International Engineering Option similar to that in ME is also available. A grade of C or better in engineering science, mathematics, and basic sciences courses is required to fulfill prerequisites in Mechanical and Energy Systems engineering courses. A grade of C or better is required for any transfer course from another university.

Energy Systems Engineering Success Curriculum

All undergraduate students in the B.S. Mechanical Engineering and B.S. Energy Systems Engineering programs must successfully complete the Mechanical Engineering Success Curriculum prior to enrolling in any upper-division (3000-level or above) courses taught by the Mechanical Engineering Department. The Mechanical Engineering Success Curriculum promotes successful completion of upper-division coursework by assuring a student that their foundational knowledge and skills are strong in mathematics and engineer-

ing fundamentals. To successfully complete the Mechanical Engineering Success Curriculum, a student must earn a minimum 3.000 GPA in the following 10 courses: MATH 2200, MATH 2205, MATH 2210, ES 1060, ES 2110, ES 2120, ES 2210, ES 2310, ES 2330, and ES 2410. AP/iB courses are excluded from the GPA calculation, but grades transferred from other institutions will be used in evaluating the ME Success Curriculum GPA.

Policy for Transfer Credit Towards Energy Systems Engineering (ESE) Core Coursework

In general, transfer of coursework toward an Energy Systems Engineering degree will follow University of Wyoming policy. Courses must be shown to be equivalent to its University of Wyoming course (latitude may be given for Energy Systems Engineering electives without a direct University of Wyoming equivalent). However, three courses are considered to be the core of the Energy Systems Engineering program, and therefore credit cannot be transferred from another institution. These courses are ESE 3020, ESE 3040, and ESE 3360. Exceptions may be made for courses from approved study abroad programs or in extreme circumstances. Please note that failing a prerequisite course resulting in a delay of graduation does not constitute an extreme circumstance. Any transfer of ESE courses requires explicit written approval from the Department.

Dual ME/ESE Degrees

In the event that a student desires to double major in ME and ESE, University policy requires that 30 credit hours past the first degree are required to earn the second degree, and college policy dictates that 24 of these credit hours must be technical coursework approved by the Department while up to 6 hours can be any student-chosen electives.

Energy Systems Engineering

Atmospheric Science	Hrs.
ATSC 2100: Global Warming	3
Chemistry	
CHEM 1020: Gen Chem I.....	4
Engineering Science	
ES 1060: Intro Eng Prob Solv.....	3
ES 2110: Statics	3
ES 2120: Dynamics	3
ES 2210: Elec Circuit Analysis.....	3
ES 2310: Thermodynamics I.....	3
ES 2330: Fluid Dynamics	3
ES 2410: Mech of Materials.....	3

Environment and Natural Resources

ENR 3000: ENR Problem Solving.....	3
ENR 4750: ENR Law and Policy.....	3
ENR 4900: ENR Assessment Practice.....	3

Math

MATH 2200: Calculus I.....	4
MATH 2205: Calculus 2	4
MATH 2210: Calculus 3.....	4
MATH 2310: Appl. Diff. Eqns.....	3

Energy System Engineering

ESE 3005: Engineering Experimentation....	3
ESE 3020: System Dynamics	3
ESE 3040: Thermodynamics II.....	3
ESE 3060: Numerical Methods for Engineers	3
ESE 3160: Thermal/Fluid Science Lab.....	3
ESE 3360: Fundamentals of Transport Phenomena	3
ESE 4060: Energy Systems Design I.....	3
ESE 4070: Energy Systems Design II	3

Life Sciences

LIFE 1010: Biology I	4
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Physics

PHYS 1220: Phys. Engineering Physics II ...	4
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Electives

Two ESE Electives (min 6 CH total, Choose 2 from: ECON 1300, ENR 2000, POLS 4051, POLS 4350, GEOL 3500, GEOL 3650, PETE 4000, ENR 4890 {Applied GIS or Econ Nat Resource})

One Math/Science Electives (min 3 CH total, select from department-approved list)

One Business Elective (min 3 CH, select from department-approved list)

Five Technical Electives (min 15 CH, Choose 5 from: PETE 2050, GEOL 4190, CE 3400, CE 4430, ME 3400, ME 3450, ME 4320, ME 4470, ME 4460, ESE 4330, ESE 4360, ESE 4380, ES 2800, ES 4455)

(See here for Math, Science and Business Elective options: http://www.uwo.edu/ceas/academics/advising/_files/advfiles/me_math_science_business_electives.pdf)

Notes:

i) Before enrolling in any upper division ESE or ME course, students must complete the ME Success Curriculum (3.000 GPA in MATH 2200, MATH 2250, MATH 2210, and the seven ES courses).

ii) Graduates must meet all college requirements and earn a minimum GPA of 2.000 in ME courses taken at UW.

A minimum of 48 hours are required, so ME, business, and technical electives should be chosen appropriately.

Energy Systems Engineering (ESE)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB↔Q]).

3005 [2010; 2020]. Engineering Experimentation. 3. A combined lecture/laboratory course introducing students to experimental methods in the context of dynamics. Written technical communication, intermediate structured programming, experimental design, fundamental statistics, and uncertainty methods (numerical and analytical) are emphasized. Collaborative writing and teamwork is introduced. Cross listed with ME 3005. *Prerequisites:* Completion of the ME Success Curriculum, ES 1060; ES 2120; corequisite ME/ENGL 2005.

3020. System Dynamics. 3. Theoretical and experimental study of the dynamics of linear and non-linear lumped parameter models of mechanical, electrical, electronic, fluid, thermal and mixed systems. Cross listed with ME 3020. *Prerequisites:* Completion of the ME Success Curriculum, ES 2210 and MATH 2310. (Normally offered fall semester)

3040. Thermodynamics II. 3. Consideration of advanced thermodynamic topics including Maxwell's relations, compressible flow, and combustion. Applications to design of refrigeration cycles, humidification systems, and Rankine cycles. Cross listed with ME 3040. *Prerequisite:* Completion of the ME Success Curriculum, CHEM 1020 and ES 2310. (Normally offered fall semester)

3060. Numerical Methods for Engineers. 3. Numerical solutions of problems commonly encountered in mechanical engineering including differentiation, integration, differential equations, system of linear and nonlinear equations, and optimization. The structured programming approach will be emphasized and applications from solid mechanics, thermal fluid sciences, materials science, and dynamic systems will be covered. Cross listed with ME 3060. *Prerequisites:* Completion of the ME Success Curriculum, ES 1060 and corequisite of MATH 2310.

3160 [2140; 2160]. Thermal/Fluid Science Lab. 3. A laboratory course to introduce students to experimental methods for temperature measure and pressure/flow characteristics of fluids. Continuation of experience with communication (written, oral, and digital), intermediate programming, experimental design, data analysis, and teamwork skills is emphasized. Cross listed with ME 3160. *Prerequisites:* Completion of the ME Success Curriculum, ES 2330; ME/ESE 3005.

3360. Fundamentals of Transport Phenomena. 3. Basic concepts of heat and mass transfer and their applications to problems involving engineering analysis and design. Topics include steady-state and transient conduction, free and forced convection (heat and mass), radiation and heat exchangers. Cross listed with ME/ARE 3360. *Prerequisites:* Completion of the ME Success Curriculum, MATH 2310, ES 2310 and ES 2330.

4060. Energy Systems Design I. 3. First of a two-course design sequence constituting a capstone design experience on an energy-related project. Multidisciplinary teams prepare a project proposal or Statement of Qualifications, generate a morphological study of their project, develop mathematical models of their design, and prepare project plans and specifications. Project management and methods are also presented. *Prerequisites:* Completion of the ME Success Curriculum, ESE 3040 and ESE 3360. (Normally offered fall semester)

4070. Energy Systems Design II. 3. [WC♦(none)] Continuation of a two-course design sequence. The design teams refine their designs, fabricate the project, test the project for compliance with the design specifications, write a comprehensive engineering design report including socioeconomic factors, and prepare and deliver a presentation of the project in a public forum. *Prerequisites:* Completion of the ME Success Curriculum, ME/ESE 4060 and WB. (Normally offered spring semester)

4330. Internal Combustion Engines. 3. Thermodynamic analysis and design of Otto and Diesel cycles for vehicle applications and stationary power generation. A substantial laboratory component with examine design and manufacturing issues, as well as engine performance in a variety of scenarios. Cross listed with ME 4330. *Prerequisites:* Completion of the ME Success Curriculum, ME/ESE 3040 and ME/ARE/ESE 3360.

4455. Combustion Engineering. 3. The basic physics and chemistry of combustion engineering and its applications are covered, including thermodynamics, chemical kinetics, multicomponent conservation equations, laminar premixed and nonpremixed flames, detonations, droplet combustion, modern engines and energy systems. Cross-listed with ME 4455 and dual-listed with ME 5455. *Prerequisite:* Completion of the ME Success Curriculum, ME/ESE 3040 and ME/ARE/ESE 3360.

4460. Solar and Geothermal Engineering. 3. An introduction to the engineering of solar-powered energy systems, including evaluation of the energy resource, passive design consid-

erations, economics of active solar systems, design of flat plate collectors and water heating systems, and design of concentrating collectors for larger building or electrical generation applications. Design considerations for geothermal energy systems for both small-scale and commercial-scale applications. Cross listed with ME 4460. *Prerequisite:* Completion of the ME Success Curriculum, ESE 3360 or ME 3360 or ARE 3360.

4470. Wind and Ocean Energy Engineering. 3. Introduction to the harvesting of wind and ocean energy, including discussions of the wind resource, wind turbine aerodynamics, blade materials, turbine dynamics, electrical systems, control systems, and energy storage. An overview of ocean energy capture systems is also presented. Cross listed with ME 4470. *Prerequisites:* Completion of the ME Success Curriculum, ES 2210, ES 2310, ES 2330, and ES 2410.

4474. Topics in Energy Systems Engineering. 1-3 (Max. 4). Directed research in mechanical engineering. *Prerequisite:* Completion of the ME Success Curriculum, ME/ESE 3005.

4580. Honors Undergraduate Research. 3. An independent research experience for undergraduate students enrolled in the Engineering Honors Program. Before registering for this class, students are responsible for discussing their interests with faculty, identifying a willing faculty research mentor. *Prerequisite:* junior or senior standing.

Department of Petroleum Engineering

4015 Engineering Building,
(307) 766-4258

Web site: www.uwyo.edu/petroleum

Department Head: Dennis Coon, Ph.D.,
Interim

Professors:

HERTANTO ADIDHARMA, B.Sc. Institute of Technology, Surabaya 1987; Ph.D. Louisiana State University 1999; Professor of Chemical Engineering 2018, 2005.

MAOHONG FAN, B.S. Wuhan University of Science and Engineering 1984; M.S. Beijing University of Science and Tech., 1992; Ph.D. Chinese Academy of Sciences 1997; Ph.D. Iowa State University 2000; Ph.D. Osaka University 2003; Professor of Chemical Engineering 2015, 2008.

KHALED A.M. GASEM, B.Sc. University of California at Berkley 1976; M.Sc. Colorado School of Mines 1979; Ph.D. Oklahoma State University 1986; Professor of Chemical Engineering 2014.

MOHAMMAD PIRI, B.Sc. Azad University, Arak 1995; M.Sc. Azad University, Tehran 1998; M.Sc. Imperial College, London 2000; Ph.D. 2004; Professor of Petroleum Engineering 2017, 2005.

Associate Professor:

LAMIA GOUAL, B.Sc. Ecole Nationale Polytechnique 1993; M.Sc. Imperial College London 1998; Ph.D. 2003; Associate Professor of Chemical and Petroleum Engineering 2014, 2007.

Assistant Professors:

MORTEZA DEJAM, B.Sc. Petroleum University of Technology 2007; M.Sc. Sharif University of Technology 2009; Ph.D. University of Calgary 2016; Assistant Professor of Petroleum Engineering 2017.

PEJMAN TAHMASEBI, B.S. Sahand University of Technology 2007; M.Sc. Amirkabir University 2009; Ph.D. University of Southern California/Amirkabir University 2012; Assistant Professor of Petroleum Engineering 2016.

SOHEIL SARAJI, B.S. Petroleum University of Technology 2004; M.S. Sharif University of Technology 2007; Ph.D. University of Wyoming 2013; Assistant Professor of Petroleum Engineering 2016.

Professors of Practice:

DOUGLAS N. CUTHBERTSON, B.S. University of Wyoming 1985; Professor of Practice in Petroleum Engineering 2016

BRIAN TOELLE, B.S. Texas A&M University 1978; M.S. Austin State University 1981; Ph.D. West Virginia University 2013; Professor of Practice in Petroleum Engineering 2015.

Associate Lecturer:

TAWFIK ELSHEHABI, B.Sc. Suez Canal University 2003; M.Sc. 2008; Ph.D. West Virginia University 2017; Associate Lecturer 2017.

Professors Emeriti:

Jack Evers
H. Gordon Harris
Norman R. Morrow
Mrityunjai P. Sharma
Brian Towler

Petroleum Engineering trains students for Wyoming's largest industries, the production of crude oil and gas. With the recognition of the state's and nation's vast reserves of natural gas, the curriculum emphasizes the production and processing of this important resource. Because of American predominance in petroleum technology, career opportunities are available throughout most of the world.

The curriculum in petroleum engineering is based upon sound preparation in fundamental sciences, mathematics, physics, chemistry, and geology. The essentials of engineering are added to this foundation: computer programming, statics, dynamics, materials science, hydraulics, and thermodynamics. To aid in developing individuals' social potential and broaden their educational background, an integrated program in humanities and social sciences is included in the curriculum. Petroleum engineering courses, which are primarily concerned with application of previously acquired knowledge to problems of the oil and gas industry, are concentrated in the junior and senior years.

Petroleum Engineering degree candidates must meet the academic requirements of the college and must have a GPA of 2.000 in Petroleum Engineering (PETE) courses attempted at UW that are applied toward graduation for the B.S. degree from the department. For approved electives, students must have prior approval of their advisor and department head. Courses must be chosen from a list provided by the department. Students must complete a minimum of 48 upper division (junior/senior) or graduate-level semester credit hours for this program.

Petroleum Engineering Program Educational Objectives

Three to six years after graduation, graduates who choose to practice in Petroleum Engineering should:

- Successfully practice the profession/field of Petroleum Engineering or related discipline; and
- Demonstrate civic engagement and successful career growth.

Petroleum Engineering Program Outcomes

During the course of study in Petroleum Engineering, the student should develop:

- an ability to apply knowledge of mathematics, science, and engineering;

- an ability to design and conduct experiments, as well as analyze and interpret data;
- an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability;
- an ability to function on multidisciplinary teams;
- an ability to identify, formulate, and solve engineering problems;
- an understanding of professional and ethical responsibility;
- an ability to communicate effectively;
- the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
- a recognition of the need for, and ability to engage in life-long learning;
- a knowledge of contemporary issues; and
- an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice.

Petroleum Engineering Undergraduate Curriculum

*CHEM 1020. Gen Chemistry I.	4
CHEM 1030. Gen Chemistry II.	4
CHEM 2300. Intro Org Chem.	4
ES 2110. Statics.	3
ES 2120. Dynamics.	3
ES 2310. Thermodynamics.	3
ES 2330. Fluid Dynamics.	3
ES 2410. Mechanics of Materials.	3
*GEOL 1100. Physical Geology.	4
GEOL 4190. Petroleum Geology.	3
GEOL Technical Elective.	3
*MATH 2200. Calculus I.	4
MATH 2205. Calculus II.	4
MATH 2210. Calculus III.	4
MATH 2310. Appl Diff Eqns.	3
PHYS 1220. Eng Physics II.	4
PETE 1060. Intro PETE.	1
PETE 2050. Fund of PETE.	3
PETE 2060. PETE Computing.	3
PETE 3025. Heat/Mass Transfer.	3
PETE 3100. Rock & Fluids Lab.	2
PETE 3255. Basic Drilling Eng.	3
PETE 3015. Multicomp Thermo.	3
PETE 3200. Reservoir Eng.	3
PETE 3265. Drilling Fluids Lab.	3
PETE 3715. Production Eng.	3
PETE 3725. Well Bore Ops.	3
PETE 4320. Well Log Interp.	3

PETE 4225. Well Test Analysis.	3
PETE 4340. PETE Economics.	3
* PETE 4736. PETE Design.	4
PETE Technical Electives.	15

*Course meets USP requirement.

Undergraduate "Major Only" Courses

Upper division PETE core courses are restricted to petroleum engineering majors only.

Technical Electives Policy

The technical electives in the PETE curriculum can be used to complete a curriculum emphasis option or a minor. The number of credits of upper division courses must be satisfied, therefore, 13 elective credits must be 3000-level courses or higher.

Notes: Technical Electives must be selected with your advisor's documented approval.

Curriculum Emphasis

The Department of Petroleum Engineering has established curriculum emphases that could shape your interest further or acquire some useful transferable skills. A curriculum emphasis is not a minor or concentration and will not be stated on your diploma. If you choose to follow a curriculum emphasis option, you should discuss it with your academic advisor so they can assist you in planning your courses.

Petroleum Engineering offers the following curriculum emphasis options:

- Unconventional Reservoirs
- Chemical Engineering
- Mechanical Engineering
- Graduate School Preparation

Minimum Grade Requirements

A grade of C or better is required for the following courses:

- USP designated courses: FYS, COM1, COM2, COM3
- All Engineering Science (ES) courses
- MATH courses that are prerequisites to ES & PETE courses
- PETE 1060-Introduction to Petroleum Engineering Problem Solving
- PETE 2050-Fundamentals of Petroleum Engineering
- PETE 4736-Petroleum Engineering Design (COM3)

Academic Suspension

Students who have been academically suspended from UW twice are no longer eligible to enroll in PETE courses.

Repeating a Course

Students who fail a PETE class three times can no longer enroll in that class.

Transfer Credit Limit

To graduate with a degree in Petroleum Engineering from UW, students must successfully complete at least 20 credit hours of required PETE courses at UW.

1. Once a student has transferred to UW's Department of Petroleum Engineering from another institution, they may transfer no more than 9 additional credits from other institutions.
2. Non-transfer students may transfer up to 18 credits from other institutions.

BS/MS Quick Start Program

The BS/MS Quick Start program in Petroleum Engineering (PETE) is designed to present highly qualified UW students with the opportunity to begin graduate study while they complete their Bachelor of Science (B.S.) degree in Petroleum Engineering. These students may apply for admission to the Quick Start program during the second semester of their junior year or during their senior year.

This program allows for early planning of the graduate portion of a student's education and provides more flexibility in the number of required courses and the order in which they are taken. The more efficient and better planned use of time should result in reduction of the time required for obtaining the Master of Science in Petroleum Engineering degree. Students who enter the Quick Start program must accept primary responsibility for actively planning their Programs of Study to assure timely completion of their course work and research programs.

The Quick Start program contains two essential elements:

1. Qualified students may receive provisional admission to the Petroleum Engineering graduate program prior to completing the normal application process. This provisional admission will permit students to make their long-term educational plans earlier in their studies, thus providing enhanced opportunities for course selection and involvement in research.
2. Students in the program may apply up to 6 credit hours of 5000-level courses toward both the B.S. and M.S. degree programs. By completing successfully up to 6 credit hours of graduate classes

during their senior year, these students will have demonstrated their ability to do graduate-level course work as undergraduates, easing their transition to the Petroleum Engineering graduate program.

For additional information, visit our website for admissions information <http://www.uwyo.edu/petroleum/undergraduate/current-students/quickstart.html> or contact our graduate admissions coordinator at pete-info@uwyo.edu.

Graduate Study

The Department of Petroleum Engineering offers graduate programs leading to the M.S. and Ph.D. degrees in petroleum engineering. The M.S. degree is offered with Plan A and Plan B options.

In addition, the Department offers an M.B.A./M.S. in Petroleum Engineering Dual Degree Program, in conjunction with the College of Business M.B.A. Program. Students pursuing this option must apply to and be offered admission from both programs.

Program Specific Admission Requirements

A. Admission Process and Requirements

Standard Admission

Admission is open to students with at least a B.S. degree in petroleum engineering who meet the minimum requirements:

1. A GPA of 3.000, or equivalent;
2. A GRE score;
3. A TOEFL score of 600 (paper-based), 250 (computer-based), or 80 (Internet based) or an IELTS score of 6.5 in each category for international applicants.

Complete official transcripts of all prior college-level coursework, current resume or curriculum vitae, recommendations from three references, and a statement of purpose must be uploaded as parts of the application.

The deadline to submit applications is February 1 each year (to be considered for Fall semester), and September 15 each year (to be considered for Spring semester).

Applications will not be processed until all required documents have been submitted.

B. Graduate Courses of Study

Incoming graduate students, not preselected by a faculty member, must meet with Petroleum faculty members to obtain information regarding research areas and current availability. The students must formally request a Petroleum faculty member of their choosing to oversee their degree study program.

Masters Program

1. All Petroleum M.S. students with a B.S. in Petroleum Engineering from an accredited program must take the following required courses:

Required Courses	Hrs.
PETE 5355.....	3
PETE 5890.....	2

At least three Core Courses from the following:

PETE 5010.....	3
PETE 5020.....	3
PETE 5060.....	3
PETE 5080.....	3
PETE 5310.....	3
PETE 5350.....	3
Total Credits	14

Plan A Thesis Additional Course

Requirements:

4000-level or above approved electives..	12
PETE 5960.....	4
Total Credits	30

Plan B Non-Thesis Additional Course

Requirements:

4000-level or above approved electives...14	
PETE 5100 or 5970	2
Total Credits	30

2. All Petroleum M.S. students with a B.S. in Chemical or Mechanical Engineering from an accredited program must take the following required courses:

Required Courses:

PETE 5340.....	3
PETE 5055.....	3
PETE 5715.....	3

At least four Core Courses from the following:

PETE 5010.....	3
PETE 5020.....	3
PETE 5060.....	3
PETE 5080.....	3
PETE 5310.....	3
PETE 5350.....	3
Total Credits	26

Plan A Thesis Additional Course

Requirements:

4000-level or above approved electives.....	7
GEOL 4190.....	3
PETE 5960.....	4

Total Credits	40
Plan B Non-Thesis Additional Course Requirements:	
4000-level or above approved electives.....9	
GEOL 4190.....3	
PETE 5100 or 5970 .....2	
Total Credits	40

Dual Degree Program - M.B.A./M.S. degree in Petroleum Engineering

3. All Dual Degree M.S. students with a B.S. in Petroleum Engineering from an accredited program must take the following required courses:

Required Courses	Hrs.
PETE 5355.....3	
PETE 5890.....2	

At least three Core Courses from the following:

PETE 5010.....3	
PETE 5020.....3	
PETE 5060.....3	
PETE 5080.....3	
PETE 5310.....3	
PETE 5350.....3	
Total Credits	14

Plan A Thesis Additional Course Requirements:

4000-level or above approved electives.....3	
M.B.A. approved electives, MBAM 5XXX, MBAM 5301, MBAM 5305.....9	
PETE 5960.....4	
Total Credits	30

Plan B Non-Thesis Additional Course Requirements:

4000-level or above approved electives.....5	
M.B.A. approved electives, MBAM 5XXX, MBAM 5301, MBAM 5305.....9	
PETE 5100 or 5970 .....2	
Total Credits	30

4. All Dual Degree students with a B.S. in Chemical or Mechanical Engineering from an accredited program must take the following required courses:

Required Courses:	
PETE 5340.....3	
PETE 5055.....3	
PETE 5715 .....3	
PETE 5355 .....3	
PETE 5890.....2	

At least four Core Courses from the following:

PETE 5010.....3	
PETE 5020.....3	

PETE 5060.....3	
PETE 5080.....3	
PETE 5310 .....3	
PETE 5350.....3	
Total Credits	26

Plan A Thesis Additional Course Requirements:

GEOL 4190.....3	
M.B.A. approved electives, MBAM 5XXX, MBAM 5301, MBAM 5305.....9	
PETE 5960.....4	
Total Credits	42

Plan B Non-Thesis Additional Course Requirements:

4000-level or above approved electives.....2	
GEOL 4190.....3	
M.B.A. approved electives, MBAM 5XXX, MBAM 5301, MBAM 5305.....9	
PETE 5100 or 5970 .....2	
Total Credits	42

Note: For a student with a B.S. in another discipline, upon acceptance into the M.S. program, the Graduate Program Committee will develop a plan of study with the consent of the advisor.

Doctoral Program

1. All Petroleum Ph.D. students with a B.S. in Petroleum Engineering must take the following required courses:

Required Courses	
PETE 5090.....3	
PETE 5355 .....3	
PETE 5890.....6	

At least three Core Courses from the following:

PETE 5010.....3	
PETE 5020.....3	
PETE 5060.....3	
PETE 5080.....3	
PETE 5310 .....3	

Electives
4000-level or above approved electives..... 21

Research
PETE 5980..... 30
Total Credits 72

2. All Petroleum Ph.D. students with an M.S. in Petroleum Engineering from UW must take the following required courses:
Plan A MS Courses..... 26

Required Courses
PETE 5090.....3
PETE 5890.....4

Electives
4000-level or above approved electives.....9

Research
PETE 5980..... 30
Total Credits 72

3. All Petroleum Ph.D. students with an M.S. in Petroleum Engineering from another institution must take the following required courses:

Transferred MS Courses approved by student's committee.....14

Required Courses
PETE 5090.....3
PETE 5890.....4

At least four Core Courses from the following:*

PETE 5010.....3	
PETE 5020.....3	
PETE 5060.....3	
PETE 5080.....3	
PETE 5310 .....3	
PETE 5350.....3	
PETE 5355.....3	

Electives
4000-level or above approved electives.....9

Research
PETE 5980..... 30
Total Credits 72

*Some or all of these credit hours can be transferred by petition, provided they are non-degree credits.

4. All Petroleum Ph.D. students with an M.S. degree in a geoscience from another accredited institution must take the following required courses:

Transferred MS Courses approved by student's committee.....12

Required Courses
PETE 5090.....3
PETE 5890.....4

At least six Core Courses from the following:*

PETE 5010.....3	
PETE 5020.....3	
PETE 5060.....3	
PETE 5080.....3	
PETE 5310 .....3	
PETE 5350.....3	
PETE 5355.....3	

At least eight additional courses:
Six (6) credits in advanced mathematics.....6
and 18 credits in petroleum engineering,
including PETE 5340, PETE 5055,
PETE 571518

Electives
4000-level or above approved electives.....9

Research

PETE 5980..... 30

Total Credits 100

*Some or all of these credit hours can be transferred by petition, provided they are non-degree credits.

Graduate Seminar Requirements

All petroleum engineering graduate students must enroll in PETE 5890, Petroleum Engineering Seminar, every semester. All seminars, including the required presentations described below, must be scheduled by the seminar coordinator. Graduate students enrolled in continuous registration are exempt from having to enroll in PETE 5890 in their final semester.

Graduate Teaching Requirement

All Petroleum Engineering graduate students must complete at least one semester as a teaching assistant within the Petroleum Engineering curriculum. Students receiving a state-funded graduate assistantship will be required to serve as a teaching assistant every semester of their award. Students funded by a faculty mentor will work with their mentor to determine an appropriate time to complete this requirement.

Program of Study Requirement

All Petroleum Engineering graduate students must complete their Program of Study worksheet at the beginning of their second academic year of study or 3rd semester of enrollment, and PhD students must submit it prior to their preliminary examination.

Ph.D. Preliminary Examination

Candidacy in the doctorate occurs upon certification of successful completion of the preliminary examination. The preliminary examination will be held at least 15 weeks prior to the final examination. The preliminary examination may not be given before: (a) the research tool requirements, if any, have been met and certification approved; (b) at least 30 hours of coursework have been completed; and (c) the doctoral program of study has been approved.

The goal of the preliminary exam is for the student to present the research proposition that is being investigated and will lead to the final dissertation, and demonstrate progress to-date. The preliminary exam consists of three components:

- a written document provided to each member of the student's graduate committee at least three weeks prior to the oral presentation;
- a public oral presentation; and
- a private examination by the student's graduate committee immediately following the oral presentation.

The written document may be in any format but must concisely provide a survey of the relevant literature, a summary of the student's progress to-date, and a clear, detailed plan for the successful completion of the proposed work. The preliminary exam oral presentation should be consistent with the written document. It should provide an appropriate literature background, demonstrate proficiency with proposed experimental/computational techniques, identify details of the experiments to be performed, and provide a timeline to final defense.

The student's committee will pass or fail the student on the strength of the preliminary examination, with an option to conditionally pass the student while requiring an interim committee meeting prior to the final Ph.D. examination. The Report on Preliminary Examination for Admission to Candidacy form sent to the Office of the Registrar reports the results of the examination.

M.S. and Ph.D. Final Examination (Thesis or Dissertation Defense)

All M.S. and Ph.D. students must orally defend their final report, thesis, or dissertation at a public final examination. If, for any reason, a student's Ph.D. research goals are substantially changed after successful completion of the preliminary examination, the student must arrange a subsequent meeting to provide their committee with an accurate and current overview of their proposed work. The final examination consists of a public defense in oral presentation format. At least three weeks before the examination, the student must provide each member of the graduate committee with a copy of the written thesis or dissertation and provide the department an announcement of their defense for public advertisement. The results of the defense are reported by the committee on the Report of Final Examination form. Often, graduate committee members request changes in the final thesis or dissertation, and they may postpone signing this form until they are satisfied that those changes have been made.

Publication of Thesis or Dissertation

After the defense, an electronic copy (in PDF format) of the thesis or dissertation must be uploaded in accordance with the directions provided on the Registrar's web site. This copy will be rejected if the format standards specified by the Thesis or Dissertation Format Guide are not met. This guide allows for a publication-ready format. An electronic copy must also be submitted to the department for the departmental library. Most students will want copies for their own use. Students should consult with their chair to determine if they also want a copy of the final paper or other research documentation.

Petroleum Engineering (PETE)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

1060. Introduction to Petroleum Engineering Problem Solving. 1. Covers elements of Petroleum Engineering calculations associated with typical computations in Drilling, Production, and Reservoir Engineering, Rock and Fluids properties, to simultaneously train the student on basic computing skills as well as basic language of Petroleum Engineering. The preferred computing tool is Matlab, which will be introduced through simple calculations on the computer. Notions of the petroleum engineering curriculum will also be provided through examples of the different subjects. *Prerequisite:* Math placement 5 or concurrent enrollment in MATH 2200.

2050 [3000]. Fundamentals of Petroleum Engineering. 3. General introduction to petroleum engineering, including petroleum geology, exploration, reservoir rocks, and fluid flow through porous media, drilling fundamentals, completion technology, well logging and testing, methods of production, stimulation methods, enhanced oil recovery, reserves and economics. *Prerequisites:* grade of C or better in both MATH 2205 and PETE 1060.

2060. Introduction to Petroleum Engineering Computing. 3. Introduces Petroleum Engineering problems and principles, develops computational skills needed to solve them, and reinforces a computational tool that will be useful for other Petroleum Engineering classes. *Prerequisites:* C or better in PETE 1060, and either a D or better in MATH 2310 or concurrent enrollment in MATH 2310.

3015 [3010]. Multicomponent Thermodynamics. 3. Introduces mixture properties, such as chemical potentials, excess proper-

ties, partial molar properties, heats of mixing, fugacities, and practical tools for estimating them from solution theories and equations of state. These tools and concepts are applied to phase and chemical equilibria. *Prerequisite:* C or better in ES 2310 and concurrent enrollment in PETE 2060. Students must be a Petroleum Engineering major. (Normally offered fall semester)

3025. Heat and Mass Transfer. 3. Introduces energy and mass transfer concepts and the development of mathematical models of physical phenomena, including convection, conduction, radiation, and mass diffusion and convection. *Prerequisites:* C or better in ES 2330 and MATH 2310. Student must be a Petroleum Engineering major.

3100. Rock and Fluids Lab. 2. Provides understanding of principles of rock and fluid properties and their measurement as part of conventional and special core analysis, as well as PVT characteristics of reservoir fluids. Students are expected to understand how to measure important rock and fluid properties using laboratory equipment, as part of reservoir characterization routines, formation damage evaluations and well log calibration protocols. Students are also expected to learn how to write succinct and organized reports. *Prerequisites:* C or better in PETE 2050. Students must be a Petroleum Engineering major.

3200 [4010]. Reservoir Engineering. 3. Covers rock and fluid properties, reserve estimation using volumetric and material balance methods, discussion of different reservoir drive mechanisms, aquifer models, Darcy's law and single-phase flow through porous media, introduction to well testing, solution of radial diffusivity equation, immiscible displacement, decline rate analysis, and reservoir simulation. *Prerequisites:* PETE 3025, C or better in PETE 2050. Students must be a Petroleum Engineering major. (Normally offered spring semester)

3255. Basic Drilling Engineering. 3. Principles and practices of oil and gas well rotary drilling, including rock mechanics, drilling hydraulics, drilling fluids, and hole deviation. Drilling equipment analysis, casing design, and drilling fluid properties. Application of modern computer-based analysis and design methods. *Prerequisites:* C or better in PETE 2050. Student must be a Petroleum Engineering major.

3265. Drilling Fluids Laboratory. 3. Measurement of physical and chemical properties of drilling fluids, including experiments on mud density control, viscosity control, rheological properties, mud hydraulics, filtration properties, mud contaminants and their

treatments. Includes design of experiments, data processing, interpretation and writing technical reports. *Prerequisites:* PETE 3255, C or better in both ES 2310 and ES 2330. Students must be a Petroleum Engineering major.

3715. Production Engineering. 3. Provides elements for calculating the production rate of oil or gas wells, including reservoir inflow performance, which is determined by the reservoir rock and fluids properties and calculated based on Darcy's law, and tubing performance, which is determined by tubing parameters and calculated based on Newtonian dynamics. Basic design of artificial lift systems, reservoir stimulations and optimization of production systems are also included. *Prerequisites:* C or better in ES 2310, ES 2330 and PETE 2050. Students must be a Petroleum Engineering major.

3725. Well Completions. 3. Covers many facets of completion and intervention in oil and gas wells, including design and procedures to meet deliverability, safety, and integrity, starting with completion, stimulation, workover, and intervention, ending with plug and abandonment requirements. *Prerequisites:* C or better in both PETE 2050 and ES 2410. Students must be a Petroleum Engineering major.

3890. Engineering Honors Program Research Methods. 3. A general approach to scientific research and graduate school preparation. Topics will include: finding a research mentor, literature search skills, using the scientific method for approaching a research problem and developing a research methodology, writing a research funding proposal, delivering a research presentation and selecting and applying for graduate school. Restricted to College of Engineering Honors Program students. Cross listed with ARE/ATSC/CE/CHE/COSC/EE/ES 3890. *Prerequisite:* sophomore standing.

3900. Undergraduate Research in Petroleum Engineering. 1-6 (Max. 6). Students carry out research appropriate to undergraduates, under faculty supervision. May be taken more than once. Requires a written research proposal to be approved by instructor prior to course start. *Prerequisites:* junior standing as a petroleum engineering major and consent of instructor.

4000. Environment, Technology and Society. 3. Explores relationships among technology, the environment and society. Studies social and humanistic aspects of using current and future technology to understand and solve environmental problems. Cross listed with CHE 4000. *Prerequisites:* junior standing and completion of two lab sciences.

4030 [3010]. Rock and Fluid Properties. 3. Reservoir rocks - mineralogy, deposition, diagenesis, porosity, permeability, pore space imaging. Coring and core analysis. Intermolecular forces and fluid properties. Fundamentals of wetting and capillarity. Hydrocarbon distribution. Chemistry of crude oils. Oil-brine-rock interactions, formation damage, reservoir wettability, and oil recovery. *Prerequisite:* PETE 2050.

4060 [4220]. Flow through Porous Media. 3. Review of properties of porous media. Relationships of permeability to porosity. Formulation of Fundamental Flow Equation. Constant Rate Solutions. Constant Pressure Solutions. The Principles of Superposition. Transient well testing of oil and gas reservoirs, including drawdown, build-up, faulted systems, interference, drillstem tests, isochronal test analysis. Dual listed with PETE 5060. *Prerequisite:* PETE 3200. (Normally offered fall semester)

4200. Natural Gas Engineering. 3. Studies development of natural gas reservoirs for normal production and as storage fields. Includes back pressure tests, hydrates, pipeline problems, cycling and use of the material balance equation. Also processing of natural gas, including compression, expansion, refrigeration, separation, sour gas treating, sulfur recovery, LNG production and carbon dioxide separation. *Prerequisites:* PETE 2050. (Normally offered fall semester)

4215. Rock Mechanics. 3. Covers rock mechanical properties, stress and strain in rock and rock masses, rock failure mechanisms, thermal-hydraulic-mechanical-chemical (THMC) coupling, and their applications to ground surface subsidence/uplift, borehole instability, and hydraulic fracturing. Dual listed with PETE 5215. *Prerequisites:* ES 2330 and 2410.

4225. Well Test Analysis. 3. Covers knowledge of well test interpretation techniques. Theory for well testing include drawdown and buildup tests, single-rate and multi-rate testing, derivative analysis, wellbore storage, type curve matching, fall off and injectivity, fractured wells, fractured reservoirs, interference and pulse testing, and horizontal well analysis. *Prerequisite:* PETE 3200. Students must be a Petroleum Engineering major.

4300. Reservoir Simulation. 3. Simulation of petroleum reservoirs, formulation of equations, finite difference methods of solution, data preparation and input, history matching case studies. Dual listed with PETE 5300. *Prerequisites:* PETE 3200, MATH 2210, MATH 4440.

4310. Fundamentals of EOR. 3. The application of physical principles to increasing the recovery from reservoirs. Miscible fluid flooding in-situ combustion, and thermal recovery. Dual listed with PETE 5310. *Prerequisite:* PETE 3200.

4320. Well Log Interpretation. 3. Studies use of various types of open hole logs for quantitative evaluation of formations. *Prerequisite:* C or better in PETE 2050. Students must be a Petroleum Engineering major. (Normally offered spring semester)

4330. Geostatistics and Subsurface Characterization. 3. An advanced skills course about subsurface modeling using diverse data (e.g. well data, seismic info, etc.), including model development, techniques, and practical applications. Students must have basic knowledge of mathematical and statistical modeling. Dual listed with PETE 5320. *Prerequisite:* Junior standing and PETE 3200 or consent of instructor.

4340. Petroleum Economics. 3. Applies principles of economics to petroleum properties. Studies taxation, present worth, rate of return, payout and decisions under uncertainty. *Prerequisite:* PETE 3200. Students must be a Petroleum Engineering major. (Normally offered fall semester)

4400. Tight Gas Sand/Coalbed Methane. 3. This course provides information needed to understand geoscience and engineering considerations concerning the development of Fractured, Tight Gas Sands and Coalbed Methane reservoirs. Subjects include the origin and accumulation of hydrocarbons within these reservoirs, and the tools, methods and workflows used for locating, characterizing, and developing these reservoir types. Dual listed with PETE 5400. *Prerequisites:* PETE 3200; student must be a Petroleum Engineering major.

4450. Unconventional Reservoirs. 3. Provides fundamental knowledge of unconventional reservoirs, including types, experimental characterization, and petrophysical properties of unconventional oil reservoirs; modeling flow in unconventional rocks; and recovery enhancement in shale oil reservoirs. *Prerequisite:* PETE 2050 and 3200.

4580. Honors Undergraduate Research. 3. An independent research experience for undergraduate students enrolled in the Engineering Honors Program. Before registering for this class, students are responsible for discussing their interests with faculty, identifying a willing research mentor, obtaining approval by said mentor, and communicating the student/faculty partnership to the appropriate staff in their home department. Must be in the Engi-

neering Honors Program. Cross listed with ATSC/BE/CE/CHE/COSC/ES/ESE 4580.

Prerequisite: junior or senior standing.

4736. Petroleum Engineering Design. 3. [(none)◀COM3] Design and development of petroleum reservoirs using principles and skills learned in the Petroleum Engineering program. Application of software for design and analysis of the drilling, reservoir and production of petroleum. *Prerequisites:* PETE 3200, PETE 3255, PETE 3715, PETE 3725, and C or better in COM2. Students must be a Petroleum Engineering major.

4800 [4850]. Shale Reservoir Development. 3. Provides an overview of the geoscience and engineering aspects involved in the exploration and development of shale reservoirs. Topics covered include organic geochemistry, geomechanics, petrophysics, geophysics, reservoir and completion engineering, and drilling. The primary phases involved in obtaining hydrocarbon production from shale reservoirs are detailed. Dual listed with PETE 5800. *Prerequisites:* C or better in both PETE 2050 and PETE 3200.

4810. Unconventional Gas Production. 3. Study of resource base, drilling, completion and production technology, and reservoir characteristics for tight gas sands. Devonian shales, coalbed methane, geopressured aquifers, and hydrates. Case histories and economics are presented in each of these. Dual listed with PETE 5810. *Prerequisite:* consent of instructor.

4830. Thermal Recovery. 3. Objective of this course is to examine and explore in depth the theoretical and applied aspects of thermal recovery process of producing hydrocarbons including state-of-the-art review. Dual listed with PETE 5830. *Prerequisite:* Senior standing in petroleum or chemical engineering.

4860. Energy, Environment, and Materials. 3. Understanding the connection between materials, energy and environment, including the history of climate and different types of energy in use for a greener planet. Provides broad knowledge in the areas of energy, material science, chemical, petroleum, and environmental engineering. Dual listed with PETE 5860. *Prerequisite:* Junior standing and PETE 2050 or consent of instructor.

4970. Internship in Petroleum Engineering. 1-6 (Max. 6). Enables credit for students in appropriate engineering activities while serving as interns in an industrial, government, or other setting. Requires a written project proposal to be approved by instructor prior to course start. *Prerequisites:* Must be involved in a petroleum engineering co-op/internship experience; consent of instructor.

4990. Topics in Petroleum Engineering. 1-6 (Max. 6). Features topics not included in regularly offered classes. *Prerequisite:* Student must be a Petroleum Engineering major.

5010. Transport Phenomena. 3. Examines the modeling of momentum, heat and mass transport. Cross listed with CHE 5010. *Prerequisite:* graduate standing.

5020. Thermodynamics. 3. Utilizing the laws of thermodynamics to a wide variety of process applications. Evaluating current methods for predicting thermodynamic properties of pure fluids and mixtures. Modeling multiphase, multicomponent equilibria. Cross listed with CHE 5020. *Prerequisite:* graduate standing.

5055. Drilling Engineering. 3. Principles and practices of oil and gas well rotary drilling, including rock mechanics, drilling hydraulics, drilling fluids, and hole deviation. Drilling equipment analysis, case design, and drilling fluid properties. Application of modern computer-based analysis and design methods. *Prerequisite:* graduate standing.

5060. Flow through Porous Media. 3. Review of properties of porous media. Relationships of permeability to porosity. Formulation of the Fundamental Flow equation. Constant Rate solutions. Constant Pressure Solutions. The Principle of Superposition. Transient well testing of oil and gas reservoirs, including drawdown, build-up, faulted systems, interference, drillstem tests, and isochronal test analysis. Dual listed with PETE 4060. *Prerequisite:* graduate standing.

5070. Multiphase Flow. 3. A thorough background in the methods of analysis and current developments in gas-liquid, gas-solid, liquid-solid, and gas-liquid-solid flows. Introduction to multiphase flow instrumentation. *Prerequisite:* graduate standing or consent of instructor.

5080. Interfacial Phenomena. 3. Introduction to surface and colloid chemistry, coagulation and flocculation, surface energy and thermodynamics of surfaces, adsorption at interfaces, surface tension, capillarity and wetting, spontaneous imbibition, applications to hydrocarbon reservoirs and oil recovery. *Prerequisite:* graduate standing.

5090. Research Methods. 2. A general approach to scientific research and graduate school. Topics include: purpose of graduate school, career options with graduate degrees, communication basics, literature search skills, presentations, research instrumentation, the scientific method, developing hypotheses, grant proposals, paper writing, research ethics, copyrights, patents, research notebooks, and classroom teaching techniques. *Prerequisite:* graduate standing.

5100. Independent Study. 1-3 (Max. 3). Selected topics in petroleum engineering. *Prerequisite:* graduate standing and consent of instructor.

5150. Topics in Petroleum Engineering. 1-3 (Max. 3). Selected topics in petroleum engineering. Cross listed with CHE 5150. *Prerequisite:* graduate standing.

5200. Problems in Petroleum Engineering. 1-3 (Max. 6). Selected topics in petroleum engineering. *Prerequisite:* doctoral student and consent of instructor.

5215. Rock Mechanics. 3. Covers rock mechanical properties, stress and strain in rock and rock masses, rock failure mechanisms, thermal-hydraulic-mechanical-chemical (THMC) coupling, and their applications to ground surface subsidence/uplift, borehole instability, and hydraulic fracturing. Dual listed with PETE 4215. *Prerequisite:* graduate standing.

5255. Advanced Drilling Engineering. 3. Principles and practices of advanced topics in oil and gas drilling engineering including advances in directional and horizontal drilling, drilling fluid hydraulics and cuttings transport. Non-Newtonian Fluid Flow Analysis, pore pressures and fracture resistance estimation methods. Application of modern computer-based analysis and design methods. *Prerequisite:* graduate standing.

5300. Reservoir Simulation. 3. Simulation of petroleum reservoirs, formulation of equations, finite difference methods of solution, data preparation and input, history matching case studies. Dual listed with PETE 4300. *Prerequisite:* graduate standing.

5310. Fundamentals of EOR. 3. The application of physical principles to increasing the recovery from reservoirs. Miscible fluid flooding in-situ combustion, and thermal recovery. Dual listed with PETE 4310. *Prerequisite:* graduate standing.

5320. Geostatistical/Subsurface Characterization. 3. Providing practical way for building realistic subsurface models. Students must have basic knowledge of mathematical and statistical modeling. Both fundamental and practical aspects are covered. Students will be able to take real data derived from subsurface modeling and build geostatistical models, which will be performed deterministically and stochastically. *Prerequisite:* graduate standing.

5340. Reservoir Engineering. 1-3 (Max. 3) Covers rock and fluid properties, reserve estimation using volumetric and material balance methods, discussion of different reservoir drive mechanisms, aquifer models, Darcy's law and single-phase flow through porous media,

introduction to well testing, solution of radial diffusivity equation, immiscible displacement, decline rate analysis, and reservoir simulation. *Prerequisite:* graduate standing.

5350. Advanced Reservoir Engineering. 3. Covers high-level understanding of modern reservoir engineering. Provides knowledge of scientific principles to formulate fluid flow, heat and mass transport in permeable media. Use analytical and computational tools to resolve research-oriented problems. Develop competence in interpreting results of modeling. *Prerequisite:* graduate standing.

5355. Mathematical Methods. 3. Covers mathematical modeling: conservation laws and constitution relationships; partial differential equations (PDEs): the types and analytical solution techniques; applied linear algebra; matrices and Eigen-analysis; numerical solution techniques: finite difference and finite element methods, Newton-Raphson method, and temporal discretization techniques, and linear solution techniques: direct and iterative methods. Cross listed with CHE 5355. *Prerequisite:* graduate standing.

5400. Tight Gas Sand/Coalbed Methane. 3. This course provides information needed to understand geoscience and engineering considerations concerning the development of Fractured, Tight Gas Sands and Coalbed Methane reservoirs. Subjects include the origin and accumulation of hydrocarbons within these reservoirs, and the tools, methods and workflows used for locating, characterizing, and developing these reservoir types. Dual listed with PETE 4400. *Prerequisites:* graduate standing.

5450. Unconventional Reservoirs. 3. Provides fundamental knowledge of unconventional reservoirs, including types, experimental characterization, and petrophysical properties of unconventional oil reservoirs; modeling flow in unconventional rocks; and recovery enhancement in shale oil reservoirs. Cross listed with PETE 4450. *Prerequisites:* graduate standing.

5715. Production Engineering. 3. Provides elements for calculating production rate of oil/gas wells, including reservoir inflow performance, determined by reservoir rock and fluids properties using Darcy's law, and tubing performance, determined by tubing parameters and using Newtonian dynamics. Basic design of artificial life systems, reservoir stimulations and optimization of production systems are included. *Prerequisite:* graduate standing.

5800. Shale Reservoir Development. 3. Provides an overview of the geoscience and engineering aspects involved in the explora-

tion and development of shale reservoirs. Topics covered include organic geochemistry, geomechanics, petrophysics, geophysics, reservoir and completion engineering, and drilling. The primary phases involved in obtaining hydrocarbon production from shale reservoirs are detailed. Dual listed with PETE 4850. *Prerequisite:* graduate standing.

5810. Unconventional Gas Production. 3. Study of resource base, drilling, completion and production technology, and reservoir characteristics for tight gas sands. Devonian shales, coalbed methane, geopressured aquifers, and hydrates. Case histories and economics are presented in each of these. Dual listed with PETE 4810. *Prerequisite:* graduate standing or consent of instructor.

5830. Thermal Recovery. 3. Objective of this course is to examine and explore in depth the theoretical and applied aspects of thermal recovery process of producing hydrocarbons including state-of-the-art review. Dual listed with PETE 4830. *Prerequisite:* graduate standing or consent of instructor.

5840. Miscible Processes. 3. Objective is to examine and explore in depth the theoretical and applied aspects of miscible processes of producing hydrocarbons including state-of-the-art review. *Prerequisites:* PETE 5310 and graduate standing or consent of instructor.

5850. Chemical Enhanced Oil Recovery Processes. 3. Objective is to examine and explore in depth the theoretical and applied aspects of the classification of enhanced oil recovery processes called chemical processes. *Prerequisite:* graduate standing.

5860. Energy, Environment, and Materials. 3. Understanding the connection between materials, energy and environment, including the history of climate and different types of energy in use for a greener planet. Provides broad knowledge in the areas of energy, material science, chemical, petroleum, and environmental engineering. Dual listed with PETE 4860. *Prerequisite:* graduate standing.

5890. Petroleum Engineering Graduate Seminar. 1 (Max. 9). Departmental seminar on current research with formal training for student presentation of technical papers. *Prerequisite:* graduate standing.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5980. Dissertation Research. 1-12 (Max. 48). Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate level degree program.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

The College of Health Sciences is the place for students interested in improving and maintaining the physical, mental, and social health of others. We offer challenging degree programs in the “helping professions” and serve as the gateway to schools of medicine, dentistry, physical and occupational therapy, physician’s assistant study, and optometry.

Health sciences students receive not only a superior education from knowledgeable and caring faculty but also precise and personal guidance from conscientious advising personnel. Students benefit, too, from practicums and internships that help them refine and test the skills acquired in lectures and labs as well as opportunities to participate in dynamic, interdisciplinary research projects.

The college is also the home of the Wyoming Institute for Disabilities (WIND); two Family Medicine Residency Centers; and the WWAMI Medical Education Program.

We serve as the state certifying office for the Wyoming, Washington, Alaska, Montana, and Idaho (WWAMI) medical education contract program with the University of Washington School of Medicine; WYDENT, the dental education contract program with the University of Nebraska and Creighton University; and two programs for the Western Interstate Commission of Higher Education (WICHE): the Professional Student Exchange Program (PSEP) and the Western Regional Graduate Program (WRGP). Refer to the sections on WWAMI, WYDENT, and WICHE in the first part of this catalog for program descriptions or go to www.uwyo.edu/certwy.

Any student seeking admission to programs in the College of Health Sciences will be required to obtain a background check as specified by college policy. Please contact your school or division for specific information.

The College of Health Sciences retains the right to deny or revoke admission to any of its programs for academic, disciplinary, ethical, or professional standards reasons.

Programs of Study

Undergraduate Degrees

Bachelor of Science

Kinesiology and Health Promotion
Medical Laboratory Science
Physical Education Teaching
Speech, Language and Hearing Sciences

Bachelor of Science in Dental Hygiene
Bachelor of Science in Nursing
Bachelor of Social Work

Graduate Degrees

Master of Science

Health Services Administration
Nursing
Kinesiology and Health
Speech-Language Pathology

Master of Social Work

Professional Degrees

Doctor of Nursing Practice

Doctor of Pharmacy

Minor in the College of Health Sciences

Disability Studies

Disability studies is a diverse interdisciplinary field that investigates broad questions about the nature, meanings, and consequences of disability from interrelated social, historical, cultural, and political perspectives. Students will gain a broad understanding of disability issues for working with people with disabilities rather than specific disciplinary skills and techniques. The minor complements any major and consists of 18 credit hours. See www.uwyo.edu/hs/divisions-and-programs/minor-in-disability-studies.html.

Undergraduate and Pre-professional Health Advising Office

Health Sciences Center, 110

The Undergraduate and Pre-professional Health Advising Office (UPHAO) in the College of Health Sciences (www.uwyo.edu/preprof/) provides pre-professional health advising to all UW students regardless of their academic majors, who are interested in pursuing future study in medicine, athletic training, chiropractic, dentistry, optometry, occupational therapy, physical therapy, physician assistant, or other health care careers such as public health. A bachelor’s degree is usually required for admission to a professional school. The University of Wyoming does not offer degrees in pre-professional areas. Students may pursue any UW degree program in which they have an interest and at the same time complete the admission requirements for the professional schools they wish to attend. The

UPHAO advises students for their professional program prerequisites as well as other aspects of becoming solid candidates. Each student will also have an advisor in his/her major for advising in the major.

Through this office, pre-health students can access current information about admission requirements, entrance examinations, application process, professional school curriculums, interviewing skills, and test preparation. Current admissions data and addresses for specific schools are also available. Specific schools may have additional requirements; students are urged to check with the schools they wish to attend.

Information and Wyoming state residency applications for the WICHE PSEP program, the WWAMI medical education program, and the WYDENT dental education program, may be found online at <http://www.uwyo.edu/certwy>.

Health Sciences (HLSC)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1090. SPARX: Topics in Interdisciplinary Health Care. 1 (Max. 3). Each semester a different topic or disease state is highlighted. Using film, lectures, and selected readings, students are introduced to interdisciplinary collaboration between health care and mental health professionals. Benefits to patient care and barriers in making interdisciplinary connections are addressed.

1101. First-Year Seminar. 3. [(none)▶FYS]
4100. Global Public Health. 3. [G▶(none)]

Introduces students to the global context of public health, to principles underlying global health, and to dimensions of public health particular to international settings. It examines major themes and policies in global health and analyzes health problems and varying responses to them in different parts of the world. Dual listed with HLSC 5100; cross listed with INST 4100. *Prerequisite:* upper division student status.

4985. Health Sciences Internship. 1-6 (Max. 6). Gives students an opportunity to gain practical experience in a health care field of their choice. The intense relationship with a mentor allows the student to become socialized into a health care field, gain practice skills, and relate to other health care professionals

in an interdisciplinary way. For S/U Only. *Prerequisite:* completion of all other degree requirements. (Offered fall, spring and summer)

4990. Current Topics in the Health Sciences. 1-6 (Max. 12). Provides upper division/graduate students with the opportunity for critical analysis and in-depth examination of various current topics in health science fields. Dual listed with HLSC 5990. *Prerequisite:* Upper-division undergraduate status, or permission from instructor.

5990. Topics In Health Sciences. 1-6 (Max. 12). Provides upper division/graduate students with the opportunity for critical analysis and in-depth examination of various current topics in health sciences fields. *Prerequisite:* graduate standing.

Dental Hygiene

The University of Wyoming and Sheridan College offer a cooperative program of dental hygiene education which, when completed, results in two degrees. An Associate of Applied Science degree in dental hygiene is awarded by Sheridan College following completion of the prerequisites and dental hygiene prescribed study. An optional Bachelor of Science in Dental Hygiene degree is awarded by the University of Wyoming following completion of the Associate of Applied Science in dental hygiene, the University Studies Program, and other requirements of the University of Wyoming, for a total of 120 credit hours including 42 upper level hours, 30 of which must be from the University of Wyoming. See www.uwyo.edu/hs/divisions-and-programs/dental-hygiene-program.html.

The American Dental Association has awarded full accreditation to the Associate of Applied Science degree in dental hygiene at Sheridan College. Graduates are eligible to take the National Board of Dental Hygiene exam, as well as regional and state exams for licensure, as registered dental hygienists.

Applicants should visit www.sheridan.edu/site/sc/academics/program/dental-hygiene for specific prerequisites and application materials. Applications are due to Sheridan College prior to February 15 of the year they wish to enter the program. Class sizes are limited. Admission is contingent upon successful completion of a background check.

Learning Outcomes

The primary objective of the program is to assure that graduates have knowledge and abilities necessary to successfully practice dental hygiene.

All prerequisite coursework must be completed with a cumulative grade point of 2.750 (on a 4.000 point scale). Courses in anatomy, physiology, and microbiology must be current within five years at the time of application to the Dental Hygiene professional program. Completion of the prerequisite courses does not guarantee admission to the professional program. Students must also complete a minimum of 20 hours of dental hygiene observation prior to application.

Bachelor of Science in Dental Hygiene Requirements

See <http://www.uwyo.edu/hs/divisions-and-programs/dental-hygiene-program.html> for a four year plan and a list of program prerequisites.

1. Program prerequisites,
2. A.A.S. in Dental Hygiene from Sheridan College,
3. Completion of all University of Wyoming requirements,
4. STAT 2050 or STAT 2070, and
5. At least 120 credit hours.

Students interested in the bachelor's degree in dental hygiene should contact the Undergraduate and Preprofessional Health Advising Office in the Health Sciences Center, room 110, or phone (307)766-3878. E-mail: hsadvise@uwyo.edu or visit <http://www.uwyo.edu/hs/divisions-and-programs/dental-hygiene-program.html>.

See the 4-year degree plan at: <http://www.uwyo.edu/acadaffairs/degree-plans/uw-4-year-plans/health-sciences/index.html>

Prerequisite courses for admission into the Dental Hygiene program at Sheridan College includes a cumulative GPA of 2.750 or better in the courses listed below. These may be taken at any institution, but if taken at the University of Wyoming, the course numbering will be as follows:

MATH 1400: College Algebra	3
LIFE 1010: General Biology	4
ENGL 1010: College Composition & Rhetoric	3
ENGL 2005: Writing in Technology and the Sciences	3
COJO 2010: Public Speaking	3
PSYC 1000: General Psychology	3
ANTH 1200: Cultural Anthropology.....	3
FCSC 1141: Principles of Nutrition	3
CHEM 1000: Introductory Chemistry.....	4
MICR/MOLB 2021: General Microbiology	4
KIN 2040: Human Anatomy	3

KIN 2041: Human Anatomy Laboratory 1
ZOO 3115: Human Systems Physiology 4

In order to receive a BSDH through the University of Wyoming, students must also take the following courses:

STAT 2050: Fundamentals of Statistics 4
(OR STAT 2070: Intro to Statistics for the Social Sciences)

Courses that will fulfill all of UW's University Studies requirements.

Required courses after admission to the Dental Hygiene program at Sheridan College (NWCC-D):

1) Sheridan College courses, taught ONLY at Sheridan College in Sheridan, WY.	
DHYG 2100: Dental Health Education.....	3
DHYG 2300: Preclinical Dental Hygiene ...	3
DHYG 2305: Clinical Dental Technology...	1
DHYG 2405: Dental Anatomy	2
DHYG 2450: Oral Radiology	3
DHYG 2451: Oral Radiology Lab	1
DHYG 2470: Orientation to Dental Hygiene	3
DHYG 2400: Head, Neck, and Oral Anatomy & Physiology	2
DHYG 2200: Pharmacology	2
DHYG 2210: Dental Embryology & Histology	2
DHYG 2350: Clinical Dental Hygiene I	3
DHYG 2420: Clinical Seminar I	2
DHYG 2455: Dental Materials	2
DHYG 2456: Dental Materials Lab	1
2) University of Wyoming courses (details below), taught ONLY at Sheridan College in Sheridan, WY.	
DHYG 3230: Clinical Seminar II	2
DHYG 3300: Clinical Dental Hygiene II	5
DHYG 3400: General and Oral Pathology ..	3
DHYG 3600: Ethics and Law in Dental Hygiene	2
DHYG 3750: Periodontology.....	3
DHYG 3770: Pain Management.....	2
DHYG 3775: Pain Management Lab.....	1
DHYG 3250: Clinical Seminar III.....	2
DHYG 3350: Clinical Dental Hygiene III...	5
DHYG 3550: Community Dental Health....	3
DHYG 3720: Office Practice	2
DHYG 3800: Board Review	1

Dental Hygiene (DHYG)

3230. Clinical Seminar II. 2. This course is a continuation of the Clinical Seminar Series. Course content will focus on the review and enhancement of instrumentation skills; the essentials of instrument selection; the role of root planing in dental hygiene; the development and refinement of skills needed for treatment of more advanced periodontal cases, which

includes the initiation of a periodontal case study; and the introduction and preparation for the use of state-of-the-art clinical technologies.

Prerequisite: DHYG 2420.

3250. Clinical Seminar III. 2. This course prepares the dental hygiene student to make the transition from an educational setting to private practice. Focus is on applying, synthesizing, and transferring clinical and didactic knowledge to clinical and ethical decision-making. Students will be engaged in problem-based case studies, application of motivational theories, and analysis of evidence-based research. *Prerequisites:* DHYG 3230, 3300 and 3350 or concurrent enrollment.

3300. Clinical Dental Hygiene II. 5. This course provides students the opportunity to gain further practical experience in dental hygiene procedures by providing comprehensive patient care in clinical settings. A flexible format allows students to meet requirements in procedures for patient record-keeping, patient education, dental prophylaxis, dental radiography and routine clinical procedures. *Prerequisite:* DHYG 2350.

3350. Clinical Dental Hygiene III. 5. This course assists students in gaining practical experience in clinical procedures requiring greater skill and knowledge than procedures previously undertaken. This course prepares students for the transition to private office practice. *Prerequisite:* DHYG 3300.

3400. General and Oral Pathology. 3. This course is designed to teach students the concepts underlying general and oral manifestations of human disease states, manifestations of specific diseases, relationships to body defense mechanisms, and potential implications for medical and dental hygiene treatment. To the extent possible, applications to clinical situations in dental hygiene practice will be made. *Prerequisites:* one year pre-dental hygiene (including general pathology); MOLB 2021 or equivalent.

3550. Community Dental Health. 3. This course provides the dental hygiene student with an introduction to basic skills needed to evaluate the dental health community, including research methodology and basic statistical analysis. It provides the student with a basic understanding of the significant social, political, psychological and economic factors influencing the American Health System. *Prerequisite:* DHYG 2100.

3600. Ethics and Law in Dental Hygiene. 2. This course provides an introduction to basic concepts in the analysis of ethical theories, principles, values, the professional code of ethics, and legal aspects associated with the dental

hygiene healthcare profession. Contemporary issues are examined in dentistry and medicine as a strategy to explore and apply ethical principles in diverse cultures and situations. *Prerequisite:* successfully complete all first-year dental hygiene courses.

3720. Office Practice. 2. This course is designed to provide the dental hygiene student with both current information and experience in office practice and management. Also included are discussions of professionalism, decision-making and leadership roles, including legal and ethical responsibilities, team responsibilities in the dental office and discussion of selecting, securing and maintaining employment. *Prerequisites:* DHYG 2300, 2350, 3300 and a communications course.

3750. Periodontology. 3. This course reviews the anatomy and histology of periodontal structures and dental accretions followed by a study of the classifications and etiology of periodontal diseases including both local and systemic factors. A thorough exploration of the hygienist's role in disease recognition, prevention, therapeutic procedures and maintenance is also included.

3770. Pain Management. 2. This course provides clinical experience with local anesthesia and inhalation sedation techniques. It includes the detection of anatomic landmarks in the mouth pertaining to specific injection sites, preparation of the armamentarium, maintenance of asepsis, simulated and real injection of anesthetic agents at predetermined sites and administration of nitrous oxide/oxygen. *Prerequisite:* successful enrollment in dental hygiene major or consent of instructor.

3775. Pain Management Lab. 1. This course provides clinical experience with local anesthesia and inhalation sedation techniques. It includes the detection of anatomic landmarks in the mouth pertaining to specific injection sites, preparation of the armamentarium, maintenance of asepsis, simulated and real injection of anesthetic agents at predetermined sites and administration of nitrous oxide/oxygen. *Prerequisites:* successful completion of sophomore year course work in dental hygiene, current certifications in CPR, and curriculum enrollment in dental hygiene major or consent of instructor.

3800. Board Review. 1. This course is designed to assist dental hygiene students in preparing for the National Board Dental Hygiene Exam, the western and central regional clinical and anesthesia board exams, and state jurisprudence exams. These exams are required for licensure to practice dental hygiene in the United States. This course includes discussion of the distinction between various agencies

in the education, healthcare and legal system which have jurisdiction over the licensure process, and the impact of cheating during any portion of the process on the public welfare. *Prerequisite:* DHYG 3300.

4850. Education Practicum in Dental Hygiene. 6. Allows students to experience both clinical and didactic elements of dental hygiene teaching. *Prerequisites:* completion of dental hygiene didactics, all requirements of program. Only available by permission of instructor. For students wishing to teach in dental hygiene programs.

Division of Communication Disorders

265 Health Sciences, (307) 766-6427

FAX: (307) 766-6829

Web site: www.uwyo.edu/comdis

Director: Mark Guiberson

Professors:

MARK GUIBERSON, B.A. University of Colorado 1997; M.A. 1999; Ph.D. Colorado State University 2006; Professor of Speech-Language Pathology 2019, 2011.

MARY HARDIN-JONES, B.A. Texas Tech University 1978; M.S. 1979; Ph.D. University of Iowa 1984; Professor of Speech-Language Pathology 2005, 2001.

DAVID L. JONES, B.S. Westminster College 1980; M.A. University of Iowa 1983; Ph.D. 1987; Professor of Speech-Language Pathology 2005, 2001.

Associate Professors:

MARY JO C. HIDECKER, B.A. University of Iowa 1981; M.A. 1984; Ph.D. Michigan State University 2004; M.S. 2011; Associate Professor of Audiology and Speech-Language Pathology 2019, 2013.

ROGER W. STEEVE, B.A. San Diego State University 1990; M.A. 1993; Ph.D. University of Washington 2004; Associate Professor of Speech-Language Pathology 2011, 2005.

Assistant Professors:

ERIN J. BUSH, B.S. University of Wyoming 2000; M.S. University of Nebraska-Kearney 2003; Ph.D. University of Nebraska-Lincoln 2011; Assistant Professor of Speech-Language Pathology 2015.

KATELYN J. KOTLAREK, B.S. University of Wisconsin-Madison 2012; M.S. Florida State University 2014; Ph.D. East Carolina University 2019; Assistant Professor 2019.

BREANNA KRUEGER, B.A. University of Wyoming 2007; M.A. University of Kansas 2011; M.A. 2013; Ph.D. 2017; Assistant Professor 2017.

Academic Professionals:

SHELLEY BARTON, B.A. University of Wyoming 2005; M.S. 2008; Instructor 2018.

TERESA J. GARCIA, B.S. University of Wyoming 1989; M.S. 1991; Senior Lecturer 2016, 1995.

ESTHER HARTSKY, B.A. Adams State University 2000; A.A.S. Pikes Peak Community College 2004; Assistant Lecturer 2017.

ERIN PAGE, B.S. University of Kentucky 2007; M.S. University of Wyoming 2014; Assistant Lecturer 2017.

KAREN RICHARD, B.A. University of Wyoming 2002; B.A. Appalachian State University 2005; M.S. University of Wyoming 2011, Assistant Lecturer 2018.

CORRI SANDOVAL, B.S. University of Wyoming 2000; M.S. 2010; Assistant Lecturer 2017.

Adjunct Clinical Instructor:

Melissa Denker, M.S., CCC-SLP

Professors Emeriti:

Janis A. Jelinek, Douglas W. Laws, Michael A. Primus

The areas of speech-language pathology and audiology are concerned with disorders of communication. Included in these areas are the studies of systems underlying the normal communicative process (phonetics, acoustics, neurology, anatomy and physiology); development of speech, hearing and language functions; deviations from the normal communicative process; and diagnosis and management of speech, language and hearing disorders.

The Division of Communication Disorders offers a bachelor's (B.S.) degree in speech, language and hearing science. The bachelor's degree is considered preprofessional preparation for entrance into a graduate program in either speech-language pathology or audiology. A graduate degree is needed to work in most employment settings. The division offers a Master of Science degree in speech-language pathology. The combined undergraduate and graduate programs are designed to prepare students to meet the academic and clinical requirements for Wyoming licensure and the Certificate of Clinical Competence awarded by the American Speech Language Hearing Association.

The graduate program in speech-language pathology is accredited by the Council on Academic Accreditation in Audiology and Speech-Language Pathology. See the division web site for additional information.

Any student seeking admission to the graduate program in Speech-Language Pathology within the Division of Communication Disorders will be required to obtain a background check as specified by college policy.

Undergraduate Learning Outcomes

The Bachelors of Science in Speech, Language, and Hearing Science provides students with a broad-based foundation in the sciences and humanities, fundamental knowledge of human communication, communication development, and the nature of communication disorders across the lifespan. This degree prepares students for professional degree programs in speech-language pathology or audiology as well as other allied career fields or degree programs. To see the most recent undergraduate student learning objectives, go to the Division website: <http://www.uwyo.edu/comdis/student-objectives-handbooks-manuals.html>.

Speech, Language, and Hearing Science Curriculum

See the 4-year degree plan at www.uwyo.edu/acadaffairs/degree-plans/uw-4-yr-plans/health-sciences/index.html.

*Lower-Division Requirements**

MATH 1400: College Algebra (transcript).....3
 LIFE 1010: General Biology4
 PSYC 1000: General Psychology3
 FCSC 2121: Child Development.....4
 KIN 2040: Human Anatomy3
 KIN 2041: Human Anatomy Lab1
 PHYS 1050: Concepts of Physics4
 (May substitute CHEM 1000/1020/1050)
 STAT 2050: Fundamentals of Statistics4
 Lower-division electives to be determined in consultation with academic advisor.

SPPA 1010: Introduction to Communication Disorders3
 SPPA 2110: American Sign Language I.....4
 SPPA 2120: American Sign Language II4
 SPPA 2210: Phonetics and Phonological Development.....3

Upper-Division Requirements

SPPA 3160: Language Development.....4
 SPPA 3265: Anatomy & Physiology of Speech, Swallowing, and Hearing.....4
 SPPA 4240: Language Disorders Across the Lifespan3
 SPPA 4310: Acoustics of Speech and Hearing3
 SPPA 4220: Speech Disorders Across the Lifespan3
 SPPA 4340: Basic Audiology3
 SPPA 4750: Research Methods in

Communication Disorders (USP COM3)3
 SPPA 4150: Aural Rehabilitation3
 SPPA 4250: Clinical Methods4
 SPPA 4380: Neurological Basis of Communication3
 Upper-Division Electives in consultation with advisor7
 Upper-Division Social Behavior Credits3 from the list below, in consultation with advisor (students responsible for knowing prerequisites for these courses)
 CNSL 4520, PSYC 4310, PSYC 4320

*Completion of all USP requirements is also necessary.
Note: A grade of C or better must be earned in all SPPA courses; courses in the major must be taken for a letter grade unless offered for S/U only. Also note that speech, language, and hearing topic courses from community colleges do not transfer or count as course equivalents.

Note: Due to national accreditation standards, undergraduate students in Speech, Language, Hearing Sciences must have taken a College Algebra course (MATH 1400) that appears on an actual transcript in order to be accepted into graduate-level programs in this field. Neither ACT/SAT math section scores nor math placement exam scores will meet this standard.

American Sign Language Studies

The American Sign Language Studies (ASL Studies) certificate program provides a foundation of American Sign Language skills and an introduction to Deaf sociocultural issues. The ASL Studies certificate program also prepares future professionals in health and education fields to communicate with and understand individuals who are Deaf. The certificate will be an asset to students who wish to pursue more education and employment in the fields of speech-language pathology, sign language interpreter, deaf educator, preschool and K-12 education, audiology, nursing, counseling and other areas. Students can obtain the ASL Studies certificate alone, or in combination with a bachelor's degree for a major they have selected.

The ASL Studies program has three learning outcomes:

1. ASL Studies students will demonstrate foundational skills in American Sign Language.
2. ASL Studies students will understand sociocultural considerations with Deaf communities.
3. ASL Studies students will engage in teaching others how to use basic American Sign Language.

ASL Studies Certificate requirements:

Course sequence for the certificate, 16 credits total:

SPPA 2110 ASL 1.....4
 SPPA 2120 ASL 2.....4
 SPPA 4070 Deaf Studies3
 SPPA 4130 Advanced Sign Language.....4
 SPPA 4140 Undergraduate Teaching
 Assistant1

Students must have earned a grade of A for all three language courses (SPPA 2110, SPPA 2120, and SPPA 4130) in order to be eligible for the certificate.

Speech and Hearing Clinic

Speech and hearing clinical services are available to University of Wyoming students. For information concerning these services, contact the Speech and Hearing Clinic.

There is a student organization with whom speech-language pathology and audiology majors may choose to affiliate, the National Student Speech-Language and Hearing Association. Objectives are to promote and recognize scholastic achievement and to support clinical, research, and service endeavors.

Graduate Study

Admission to the M.S. Degree Program in Speech-Language Pathology

Admission Requirements

Admission to the master’s program in speech-language pathology is made on a competitive basis. We accept students to start in the fall of each year. For application, admission, and a description of the program, see the division website. Applicants must have completed a bachelor’s degree or equivalent from a regionally accredited institution. All applicants should have at least a 3.000 cumulative GPA (scale of 4.000). Graduate Record Examination (GRE) scores must be reported as part of the application procedures (see below).

Application Procedure

Applications to our master’s program must be made through an electronic, centralized application service: the Communication Sciences and Disorders Centralized Application Service for Clinical Education in Audiology and Speech Language Pathology (CSDCAS). Instructions and application procedures are available at <https://portal.csdcas.org>. Check the division web site in September for instructions.

Applicants will be notified of the division’s decision on acceptance, alternate, or denial by mid-March. Applicants must respond to the offer by April 15. Alternates will be offered positions that become available after April 15.

For International (including Canadian) students, the university must determine whether financial resources are sufficient for study here.

International Students

International students from non-English-speaking countries need a TOEFL score of 600 to show English proficiency. Additional sources of evidence may be requested by the division to make a final decision. English proficiency must be sufficient for success in graduate school and certification as a speech-language pathologist in the United States, even if the applicant intends to return to the native country.

Conditional Status

An applicant may be admitted conditionally if he or she does not meet the GPA requirements for full admission, and the Division determines that there are sufficient areas of strength for success in graduate school in comparison to other applicants. Conditions will be placed on admission such as graduate grade point average, performance criteria, or completion of certain courses.

Requirements Following Offer of Admission

Students who accept an offer of admission to the program must then apply to the university for formal admission.

Criminal Background Check

Admission to the graduate program in speech-language pathology is contingent upon passing a criminal background check. Each student recommended for admission into program will be required to obtain, pay, and pass a criminal background check. These background checks are routinely required by schools, hospitals, and other agencies that participate in the clinical education of our students. The results of the background check may determine admission to our program. Please see the College of Health Sciences web site for the policy and procedures document.

Graduate Student Outcome Data

In the last three years, 90% of MS SLP students completed the program “on-time” and 100% obtained employment and passed the Praxis Exam.

Program Specific Graduate Assistantships

Financial help for graduate students is available each year through the department with assistantships and other funding. Typically, graduate assistantships include one-half tuition support and a monthly stipend. These

assistantships require the student to spend 10 hours per week assisting faculty members in teaching and research. Awards are competitive and based on past academic performance, evidence of professional promise, and letters of recommendation. Graduate assistantships are awarded to applicants with full admission.

Differential Tuition

The graduate program in speech-language pathology has a differential tuition rate. See the Division website and/or fee book for details.

Program Specific Degree Requirements Master’s Programs

The Master of Science in Speech-Language Pathology is a professional degree program. The graduate program consists of a minimum of 55 credit hours of academic coursework, on-campus clinical practica, and external clinical practica. Students may pursue either a thesis or non-thesis track during their graduate studies. Both tracks lead to eligibility for the Certificate of Clinical Competence in Speech-Language Pathology (CCC-SLP), granted by the Clinical Certification Board of the American Speech-Language-Hearing Association. Graduates are also eligible for the Wyoming license in speech-language pathology. A supervised Clinical Fellowship Year (CFY) is required beyond the graduate degree for certification. The master of science program in speech-language pathology is accredited by the Council on Academic Accreditation in Audiology and Speech-Language Pathology (CAA) of the American Speech-Language-Hearing Association.

Typical Programs of Study

There are two programs of study for the MS SLP program. The Plan A is the thesis option (64 credit hour program), and Plan B is the non-thesis option (61 credit hour program).

Both programs require 36 credits of graduate academic work and 24 credits of graduate clinical practicum.

- 36 hours of graduate academic work include:
- SPPA 5020: Phonological Assessment and Intervention
 - SPPA 5140: Evaluation Procedures in Communication Disorders
 - SPPA 5280: Early Language Intervention
 - SPPA 5220: Voice Disorders
 - SPPA 5130: Adult Neurogenic Disorders
 - SPPA 5330: School-Age Language Intervention
 - SPPA 5120: Stuttering
 - SPPA 5110: Craniofacial Disorders
 - SPPA 5230: Dysphagia
 - SPPA 5000: Seminar in Communication Disorders

SPPA 5100: Motor Speech Disorders

SPPA 5210: AAC

SPPA 5380: Professional Practice

24 hours of graduate clinical practicum include:

SPPA 5030 Clinical Practicum

SPPA 5270: Educational Practicum

SPPA 5290: Medical Practicum.

Plan A students complete 4 credits of SPPA 5960 Thesis Research.

Plan B students complete 1 credit of SPPA 5961 Graduate Projects.

Note: Specific degree requirements (course name and content), may change based on departmental decisions or requirement changes from accreditation and licensure bodies.

Wyoming Assessment of Knowledge and Skills

The MS SLP program's Wyoming Assessment Of Knowledge And Skills (WAKS) are linked to American Speech-Language Hearing Association (ASHA) Council for Clinical Certification in Audiology and Speech-Language Pathology (CFCC). By meeting the WAKS objectives and successfully completing clinical practicum requirements, MS SLP graduates are eligible to apply for national certification from the American Speech-Language Hearing Association, and are eligible for state licensure in Wyoming. To see the most recent WAKS objectives, go to the Division website: <http://www.uwyo.edu/comdis/student-objectives-handbooks-manuals.html>.

Leveling Coursework

Leveling is completed on a course-by-course basis. Students are encouraged to enroll in a second bachelor's degree program. Any semester in which a student takes a graduate class (numbered 5000 or above), the student must change status to non-degree graduate (NDG). This allows the graduate courses to be applied to the master's program at a later date. Fees and tuition for all the coursework in that semester are charged at the graduate student rate. Refer to the division website for a list of courses.

Continuing Education

Students may take graduate coursework as continuing education without having been admitted to the graduate program, if instructor consent is granted. If students are accepted at a later date into the graduate program, they may apply a maximum of 12 graduate credit hours earned as a non-degree student toward their graduate degrees. Coursework submitted must be approved by the division at the time

the official program of study is submitted. Coursework may not be older than 6 years from time of master's graduation.

Course Transfers and Waivers

In accredited programs of speech-language pathology, evaluation involves both course grades and demonstration of specific knowledge and skills. As a result, for any course transferred, waived, or applied from non-degree status, evidence of the knowledge and skills linked to that course will still be required.

Speech-Language Pathology (SPPA)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀Q]).

1010. Introduction to Communication Disorders. 3. [I,L◀(none)] Introduces information regarding basics of speech and hearing. Discusses disorders of speech and hearing by defining the problem, etiology or theories of cause, classifications and controversies, evaluation techniques and therapies to correct the disorder.

1101. First-Year Seminar. 3. [(none)◀FYS]
2110 [4100]. American Sign Language I. 4. [(none)◀H] Basic comprehension and expression of American Sign Language (ASL), the language used by the Deaf community in the United States. ASL vocabulary, grammar, and pragmatics are taught through lecture, conversation, and storytelling. The direct experience method (using ASL with no voice) is utilized to enhance the learning process.

2120 [4120]. American Sign Language II. 4. [(none)◀H] Second level of ASL comprehension and expression. ASL vocabulary, grammar, and pragmatics, along with increased fluency, are taught through lecture, conversation, and storytelling. Translation from English to ASL is addressed. *Prerequisite:* SPPA 2110.

2210 [3210]. Phonetics and Phonological Development. 3. Articulatory description of speech sound production and normal phonological development. Introduction to the International Phonetic Alphabet and speech transcription skills. *Prerequisite:* SPPA 1010 or consent of instructor.

2250. Clinical Observation. 1. Students obtain a minimum of 10 approved observation hours of live and recorded speech-language pathology and audiology services. Weekly class meetings will discuss the communication disorders and assessment/treatment activities observed. ASHA Code of Ethics, HIPAA

procedures, and observer requirements (e.g., background checks, TB screen) will be conducted. *Prerequisite:* SPPA 1010.

3160 [4160]. Language Development. 4. Deals with the development of semantics, syntax, morphology, discourse, and pragmatics for typically-developing children from infancy to adolescence. Includes prelinguistic and paralinguistic communication, the cognitive correlates of communication, and written language. Considers the effects of sociocultural context and multiple language acquisition. Application component provides weekly experience in language sample analysis. *Prerequisite:* SPPA 1010 or instructor permission.

3265 [3400]. Anatomy and Physiology of Speech, Swallowing and Hearing. 4. Introduces the student to the anatomy of the normal speech and hearing systems as well as the physiologic underpinnings of the speech (respiration, phonation, articulation), swallowing, and hearing (external, middle, and inner ear) systems. Theories of speech production and speech perception are presented. *Prerequisites:* KIN 2040 or consent of instructor.

4000. Workshop in Speech Pathology/Audiology. 1-8 (Max. 8). Varies with interests of student requests. Incorporates material relative to any area of speech and hearing. *Prerequisite:* consent of instructor. (Offered based on sufficient demand and resources)

4070. Deaf Studies. 3. [CS,D◀H] Studies deaf culture and deaf history in the United States. Culture topics will include deaf community dynamics, humor, behavior, emotional and social interaction, besides issues involving deaf children as a linguistic minority. History will be discussed from the 1700s to the present in the U.S. *Prerequisites:* SPPA 2110.

4130. Advanced ASL. 4. Third level of ASL comprehension and expression. Addresses increased fluency in ASL; register variation for different conversational participants; and specialized vocabulary, including sexuality and religion. Translation from English to ASL is addressed. *Prerequisites:* SPPA 2120.

4140. Undergraduate Teaching Assistant. 1 (Max. 2). Students assist instructor in major courses that they have successfully completed, including assisting with lab or practice sessions, providing individual student assistance, and participating in other student outreach activities on behalf of the Division. One semester credit hour requires 4 hours of work per week. Satisfactory/Unsatisfactory only. *Prerequisites:* consent of instructor/department and junior standing.

4150. Aural Rehabilitation. 3. Examines basis for and characteristics of communication problems created by hearing loss and manage-

ment procedures to facilitate communication and adjustment to hearing loss. Includes acoustic and visual properties of speech, amplification devices and hearing loss in school children. *Prerequisite:* SPPA 4340 or consent of instructor.

4200. Audiology Internship. 1-2 (Max. 4). Audiology internship in the UW Speech and Hearing Clinic to further the student's experience in an audiology clinic prior to their applying to an audiology graduate program. *Prerequisites:* SPPA 4340 and consent of instructor.

4220. Speech Disorders Across the Lifespan. 3. The nature and causes of developmental and acquired speech disorders across the lifespan are examined. Topics include developmental speech sound disorders, apraxia, stuttering, dysarthria, voice disorders and other disordered speech populations. Principles of assessment and remediation are introduced. *Prerequisite:* SPPA 2210 or consent of instructor.

4240. Language Disorders Across the Lifespan. 3. The nature and causes of developmental and acquired language disorders across the lifespan are examined. Topics include the behavioral and linguistic characteristics of specific language impairment, intellectual disability, autism, traumatic brain injury, right hemisphere trauma, aphasia, and dementia. Principles of assessment and remediation are introduced. *Prerequisites:* SPPA 3160 or consent of instructor.

4250. Clinical Methods. 4. Introduction to clinical procedures, such as: collecting data, clinical writing and documentation, reviewing practice regulations, interviewing, and counseling. Students will obtain initial clinical experience (i.e. observation, simulation and/or clinical assignment). Requirements (e.g., background check, TB screen) must be met for involvement in the Speech & Hearing Clinic. *Prerequisites:* SPPA 3265.

4310. Acoustics of Speech and Hearing. 3. Study of 1) the nature of sound and 2) normal speech and hearing processes. Topics include characteristics of simple and complex sound, sound travel in the environment, psychoacoustics, speech perception, speech production, and analysis of sound in humans. *Prerequisite:* SPPA 2210 or consent of instructor.

4340. Basic Audiology. 3. An introduction to audiology as a profession, with primary focus on screening and diagnostic methods for the clinical evaluation of hearing loss in children and adults. *Prerequisite:* SPPA 3265 or concurrent enrollment. (Normally offered spring semester)

4380. Neurological Basis of Communication. 3. Studies details of human nervous system, including central and peripheral nervous

systems, major motor and sensory pathways and special senses. Emphasizes neurology of various communication disorders. *Prerequisite:* SPPA 3265 or consent of instructor.

4750. Research Methods in Communication Disorders. 3. [WC◀COM3] Deals with scientific investigation of normal, disordered, and intervention aspects of speech, language, and hearing. Topics include evaluating and synthesizing published research, research writing, research design, and data analysis techniques. The aims are to develop writing competence within the discipline, to create research-aware clinicians, and to introduce students to research careers. *Prerequisite:* A statistics course.

4890. Independent Study. 1-3 (Max. 4). An independent study will be developed by the instructor and undergraduate student. It will consist of activities such as: conducting a small research project, assisting in a research project, composing a systematic research review, participating in a clinical experience, or helping to develop a professional development or public awareness program. *Prerequisite:* Consent of instructor.

5000. Seminar in Communication Disorders. 1-8 (Max. 8). The participation in and discussion of special problems and/or research related to speech-language, pathology and audiology. *Prerequisite:* B.S. degree and consent of instructor.

5020. Phonological Assessment and Intervention. 3. Emphasis on normal phonetic and phonologic development, diagnosis and clinical management of articulatory and phonological disorders. *Prerequisite:* SPPA 3210.

5030. Clinical Practicum. 1-4 (Max. 12). Supervised clinical experience with speech, language, and hearing disordered children and adults under supervision of University of Wyoming Speech and Hearing Clinic faculty. *Prerequisite:* matriculating graduate students only.

5100. Motor Speech Disorders. 3. Evaluation and treatment of motor speech disorders. Topics will include characteristics of disordered speech associated with neurological impairments/diseases; methods for evaluating communication disorders associated with dysarthria, apraxia of speech, and other neurological and acquired conditions, and treatment approaches. *Prerequisite:* SPPA 4380 or a course covering neuroanatomy/physiology of normal and disordered communication.

5110. Craniofacial Disorders. 2. Studies communication disorders related to cleft lip and palate disorders and associated craniofacial sequences and syndromes. Assessment and treatment of these communication disorders is presented in the context of interdisciplinary

management. Surgical and nonsurgical treatment procedures employed to manage speech problems associated with velopharyngeal insufficiency are included. *Prerequisite:* SPPA 3265, SPPA 2210.

5120. Stuttering. 2. Theories of etiology, symptoms of the problem, diagnosis and treatment of childhood non-fluency and various approaches to therapy for the adult stutterer. *Prerequisite:* graduate level standing.

5130. Adult Neurogenic Disorders. 4. This course will cover acquired neurogenic communication disorders. Topics include language disorders (focusing on Aphasia) as well as cognitive-communication disorders (i.e., traumatic brain injury, Right Hemisphere Dysfunction, and Neurocognitive disorder). This graduate course provides 1) a basic understanding of the neuroanatomical/physiological basis and 2) instruction regarding evaluation and treatment methods. *Prerequisites:* SPPA 4380.

5140. Evaluation Procedures in Communication Disorders. 3. Focuses on the processes and procedures related to the evaluation of communication disorders. Topics include interviewing, norm-referenced assessment, criterion-based measurement, dynamic assessment, progress monitoring, and psychometric analysis. Overviews models of disability, such as medical, functional, and sociopolitical models, and how they influence the evaluation process. *Prerequisite:* acceptance to the University of Wyoming SLP Master's Program.

5210. Augmentive and Alternative Communication. 3. Selection, design, and application of augmentive and alternative communication (AAC) systems to enhance communication, education, and quality of life for individuals with developmental and acquired disorders.

5220. Voice Disorders. 3. Study of the etiology, assessment, and remediation of voice disorders. Includes a discussion of preventing disorders, maintaining a healthy voice, and normal changes in voice. Presentation of rehabilitation options for laryngectomized speaker. *Prerequisite:* SPPA 3265.

5230. Dysphagia. 3. Provides information regarding the anatomy and physiology of the adult and pediatric swallowing mechanisms, the diagnosis of dysphagia and feeding disorders using clinical and instrumental approaches, the medical diagnoses for which dysphagia is a common symptom, and methods that are commonly used to treat dysphagia and feeding disorders. *Prerequisite:* SPPA 3265.

5270. Educational Practicum. 1-12 (Max. 12). Under supervision, the student is given increased responsibility for performing speech and language assessments, hearing screenings,

and treatment of children in an educational setting. Students will relate to other educational personnel and counsel teachers and families about communication disorders. *Prerequisites:* completion of at least two semesters (including summer) of approved graduate coursework and clinical practicum (SPPA 5030); and approval of faculty.

5280. Early Language Intervention. 3. Principles and techniques of language assessment and intervention for preschoolers, infants, and low-functioning individuals. *Prerequisite:* SPPA 3160.

5290. Medical Practicum. 1-12 (Max. 12). Under supervision, the student is given increased responsibility for performing speech and language assessments, hearing screenings and treatment of children and adults in a medical setting. Students relate to other medical and clinical personnel and counsel professionals and families about communication disorders. *Prerequisites:* Completion of at least two semesters (including summer) of approved graduate coursework and clinical practicum; and approval of faculty.

5330. School-Age Language Intervention. 3. Principles and techniques of language assessment and intervention for school-age children and adolescents with particular attention to service delivery issues in schools. *Prerequisite:* SPPA 3160.

5380. Professional Practice. 3 (Max. 9). Emphasizes issues related to professional practice of speech-language pathology, such as professional ethics, scope of practice, professional standards, and techniques of counseling clients. This course applies to speech-language pathologists working in either the medical or school setting. This course prepares the speech-language pathologist to collaborate with other professional in the workplace through discussion and activities of inter-professional practice and education (IPP and IPE). *Prerequisite:* graduate standing in Communication Disorders and consent of instructor.

5500. Topics in Communication Disorders. 1-8 (Max. 9). Provides a critical review of recent theories and developments in area of communication disorders. This is a continuing seminar course dealing with various advanced topics in communication disorders. *Prerequisite:* graduate standing.

5750. Research Methods in Speech Pathology and Audiology. 3. Emphasizes the application of scientific methodologies to areas of Speech-Language Pathology and Audiology. Topics to be covered include: introduction to writing research papers; reviewing and critiquing the literature; experimental designs;

techniques in data analyses. *Prerequisite:* STAT 2070 or equivalent; B.S. degree in speech pathology audiology; and acceptance into the graduate program.

5890. Independent Study. 1-3 (Max. 4). Graduate-level independent study will be developed by the instructor and student. It will consist of activities such as: conducting a research project of a smaller scale than a thesis, assisting in a research project, composing a systematic research review, or developing a professional education or public awareness program. Satisfactory/unsatisfactory only. *Prerequisite:* graduate standing.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Students are expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5961. Graduate Projects. 1-4. (Max. 4). Limited to those students enrolled in a Plan B graduate program. Students should be involved in non-course scholarly activities in support of their Plan B project. *Prerequisites:* must be enrolled in Plan B program and have departmental approval.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

Division of Kinesiology and Health

Corbett Building, (307) 766-5284

FAX: (307) 766-4098

Web site: www.uwyo.edu/kandh

Director: Derek Smith

Professors:

TAMI BENHAM DEAL, B.S. Indiana University 1981; M.S. 1988; P.E.D. 1989; Professor of Kinesiology and Health 2012.

JAYNE M. JENKINS, B.S. Mankato State University 1971; M.S. University of Wyoming 1995; Ph.D. University of North Carolina 1999; Professor of Kinesiology and Health 2011, 1999.

TRISTAN WALLHEAD, B.S. Loughborough University 1994; M.S. Leeds Metropolitan University 2000; Ph.D. Ohio State University 2004; Professor of Kinesiology and Health 2017, 2004.

Associate Professors:

BOYI DAI, B.Ed. Beijing Sport University 2007; M.S. Iowa State University 2009; Ph.D. University of North Carolina at Chapel Hill 2012; Associate Professor of Kinesiology and Health 2017, 2012.

CHRISTINE M. PORTER, B.S. University of Maryland 1993; M.A. University of London 2002; Ph.D. Cornell University 2010; Associate Professor of Kinesiology and Health 2016, 2010.

R. TUCKER READDY, B.A. University of California, Berkeley 2000; M.A. San Diego State University 2004; Ph.D. Oregon State University 2009; Associate Professor of Kinesiology and Health 2016, 2010.

DEREK SMITH, B.S. Colorado State University 1997; M.S. Wake Forest University 1999; Ph.D. University of Colorado 2003; Associate Professor of Kinesiology and Health 2009, 2003.

QIN ZHU, B.S. Shanghai University of Sports 1999; M.Ed. 2002; Ph.D. Indiana University 2008; Associate Professor of Kinesiology and Health 2014, 2008.

Assistant Professors:

DANIELLE BRUNS, B.S. Linfield College-McMinnville 2008; M.S. Colorado State University 2010; Ph.D. 2013; Assistant Professor of Kinesiology and Health 2018.

EVAN C. JOHNSON, B.A. The George Washington University 2004; M.A. University of Connecticut 2008; Ph.D. 2014; Assistant Professor of Kinesiology and Health 2015.

BEN KERN, B.A. Western Colorado University 1999; M.A. Adams State University 2002; Ph.D. University of Illinois Urbana-Campaign 2017; Assistant Professor Kinesiology and Health 2020.

EMILY E. SCHMITT, B.S. Elon University 2007; M.S. University of North Carolina at Charlotte 2009; Ph.D. Texas A&M University 2015; Assistant Professor of Kinesiology and Health 2018.

Academic Professional:

MARCI SMITH, B.S. Colorado State University 1995; M.S. Wake Forest University 1998; Senior Lecturer in Kinesiology and Health 2015, 2003.

Adjunct Faculty:

Laurence Deal, Shane Tweeter

Professors Emeriti:

Paul Dunham, Ward Gates, Charles W. Huff, Donna Marburger, D. Paul Thomas, Mark Byra

The Division of Kinesiology and Health offers the Kinesiology and Health Promotion (K&HP) major and the Physical Education Teacher Education (PHET) major, preparing students in kinesiology and health promotion for a variety of clinical and non-clinical settings and preparing students to teach physical and health education in schools K-12. Students enrolled in these programs must meet academic standards as determined by the Division of Kinesiology and Health, College of Health Sciences, and the University of Wyoming.

The K&HP major prepares students well for admission to physical therapy school and occupational therapy school, as well as other health professions (e.g., physician, physician assistant, dentist, chiropractor, optometrist, etc.). Approximately 60% of students majoring in K&HP apply to one of these health professional schools once they have completed their B.S. degree in Kinesiology and Health. Other students majoring in training, fitness, recreation, and leisure, and health promotion with state agencies – the job market is very diverse for these students.

The PHET program prepares students to teach physical and health education (PHET) in schools K-12. The PHET major is a nationally recognized program for meeting the NASPE/NCATE Initial Physical Education Teacher Education Accreditation Standards. This program offers individuals opportunity to combine certifications/endorsements in health education K-12, adapted physical education K-12, and coaching.

A graduate program leading to a Master of Science degree in Kinesiology and Health is offered by the Division.

Professional Program

Students who meet University of Wyoming entry requirements are admitted to the university in one of the two undergraduate majors that leads to the Bachelor of Science degree. The Division's undergraduate majors

are open at the freshman level to all graduates of accredited high schools. Advanced placement for students with previous college credit is based on evaluation of transcripts of previous academic work.

Students in the Kinesiology & Health Promotion (K&HP) program are ready to move forward in the junior year of the program when they complete the pre-requisite requirements to enroll in KIN 3021 and 3022, Physiology of Exercise lecture and laboratory. To be eligible for the K&HP Professional Program (junior/senior years), students must have completed all program course prerequisites and have a minimum cumulative grade point average of 2.750, preferred GPA of 3.000. Advancement in the K&HP Professional Program is complete once prerequisite criteria is met.

The entry course for admission to the Physical Education Teacher Education (PHET) program is KIN 3012, Teaching Lab I. To be eligible, for the PHET professional program, students must have completed all program course prerequisites and have a minimum cumulative grade point average of 2.750, preferred GPA of 3.000. Admission to the last two years of the PHET major is a competitive process and applicants meeting minimum requirements are not guaranteed admission to the major. Application to the PHET majors is conducted only for fall. The application deadline is April 15.

Undergraduate Majors

The requirements to graduate with a Bachelor of Science degree in the majors offered by the Division of Kinesiology and Health are as follows:

I. Kinesiology and Health Promotion Major

Students must complete 48 credit hours of upper division coursework (3000- or 4000-level courses) to meet the Division's minimum 48 credit hour requirement for the B.S. degree in Kinesiology and Health Promotion.

NOTE: Students should complete CPR & first aid certification and the certification should remain current throughout the program. Cards can be presented to the division registrar in Corbett 119 to be cleared of the requirement on the degree evaluation.

See the 4-year degree plan at: <http://www.uwyo.edu/acadaffairs/degree-plans/uw-4-year-plans/health-sciences/index.html>

*Requirements to be completed (with a minimum cumulative GPA of 2.750 (preferred 3.000) before taking KIN 3021**

MATH 1400, 1405, or 1450: College Algebra, Trigonometry, or Combined	3-5
LIFE 1010: General Biology	4
CHEM 1000 or 1020: Introductory Chemistry or General Chemistry I	4
PSYC 1000: General Psychology	3
FCSC 1141: Principles of Nutrition	3
HLED 1006: Personal Health.....	3
KIN 1006: Introduction to Kinesiology and Health**	1
KIN 2040: Human Anatomy.....	3
KIN 2041: Human Anatomy Lab	1
PHYS 1050 or 1110: Concepts of Physics or General Physics I.....	4
STAT 2050 or 2070: Fundamentals of Statistics or Introductory Statistics	4
ZOO 3115: Human Systems Physiology	4
<i>Required and elective upper-division</i>	
<i>Additional elective course work (including any additional upper-division electives) must be discussed with your academic advisor.</i>	
<i>KIN/HLED courses</i>	
HLED 3020: Community and Public Health Promotion.....	3
KIN 3021: Physiology of Exercise	3
KIN 3022: Physiology of Exercise Lab.....	1
KIN 3010: Fundamentals of Health and Fitness Assessment.....	3
KIN 3034 or 4020: Lifespan Motor Development or Motor Behavior	3
KIN 3037 or 3038: Sport Psychology or Exercise Psychology.....	3
KIN 3042: Biomechanics of Human Movement	3
KIN/HLED Elective coursework.....	15
in consultation with advisor.**	
KIN/HLED 4015 or 4016	6-12
(culminating experience in the final year of study)	
Additional elective coursework.....	25
5 of which must be upper-division, to be discussed with your academic advisor	

* Completion of all USP requirements is also necessary.

** Note: KIN 1006 is not required for students who have completed the KIN 1101 FYS.

*** Please consult your academic advisor regarding these courses. Possible KIN/HLED electives can be found in the Kinesiology and Health Promotion Worksheet at this site: <http://www.uwyo.edu/kandh/undergraduate-studies/undergraduate-programs.html>

II. Physical Education Teacher Education K-12

Students must complete 48 credit hours of upper-division coursework (3000- or 4000-level courses) to meet the Division's requirement for the B.S. in Physical Education Teacher Education. For any elective coursework, it is recommended that these courses are selected from Sections III or IV below.

In order to advance into the professional program, students must be admitted through a competitive application process. The entry course for admission to the Physical Education Teacher Education (PHET) program is KIN 3012, Teaching Lab 1. To be eligible, for the PHET professional program, students must have completed all program course prerequisites and have a minimum cumulative grade point average of 2.750, preferred GPA of 3.000.

NOTE: Students should complete CPR certification and the certification should remain current throughout the program. Cards can be presented to the division registrar in Corbett 119 to be cleared of the requirement on the degree evaluation.

See the 4-year degree plan at: <http://www.uwyo.edu/acadaffairs/degree-plans/uw-4-year-plans/health-sciences/index.html>.

*Prerequisites for admission into the Physical Education Teacher Education program:**

MATH 1400, 1405, or 1450: College Algebra, Trigonometry, or Combined	3
LIFE 1010: General Biology	4
CHEM 1000 or 1020: Introductory Chemistry or General Chemistry I	4
FCSC 1141: Principles of Nutrition	3
HLED 1006: Personal Health.....	3
PSYC 1000: General Psychology	3
KIN 2000: Movement Core I: Striking/Fielding/Invasion Games.....	2
KIN 2001: Movement Core II: Net and Target Games	2
KIN 2003: Movement Core IV: Educational Games/Gymnastics	2
KIN 2004: Movement Core V: Creative Movement/Dance/FMS	3
KIN 2005: Movement Core VI: Fitness and Physical Activity	2
KIN 2040: Human Anatomy	3
KIN 2041: Human Anatomy Lab	1
PHYS 1050 or 1110: Concepts of Physics or General Physics I.....	4
STAT 2050 or 2070: Fundamentals of Statistics or Introductory Statistics	4
ZOO 3115: Human Systems Physiology	4
EDSE 3540: Teaching Reading in the Content Area.....	3

*Required courses after admission into the professional program:***

KIN 3011: Teaching Methods in Physical Education	3
KIN 3012: Teaching Laboratory I.....	3
KIN 3015: Teaching Laboratory II.....	3
KIN 3021: Physiology of Exercise	3
KIN 3022: Physiology of Exercise Lab.....	1
KIN 3034: Lifespan Motor Development...3	
KIN 3037 or 3038: Sport Psychology or Exercise Psychology.....	3
KIN 3042: Biomechanics of Human Movement	3
KIN 3050: Care and Prevention of Athletic Injuries	2
KIN 3060: Understanding Skill Acquisition for Teaching.....	3
KIN 4012: Curriculum Development in Physical Education	3
KIN 4013: School Administration for the Health Sciences.....	2
KIN 4017: Teaching Laboratory III	3
KIN 4055: Adapted Physical Education	2
KIN 4080: Assessment in Physical Education	3
KIN 4099: Student Teaching in Physical Education***	12

* Completion of all USP requirements is also necessary.
** See the degree plan for the order in which these courses must be taken. Consult with your academic advisor if you have any questions.

*** Note: Students must be certified in first aid and CPR prior to enrollment in KIN 4099.

III. Additional School Endorsements K-12

In addition to completing the Bachelor of Science degree in physical education teacher education from the University of Wyoming, students can qualify for K-12 endorsements in adapted physical education and/or health education by completing the following course requirements:

A. Adapted Physical Education K-12

EDEX 2484.....	3
KIN 4065.....	3
KIN 4075.....	3

B. School Health Education K-12

HLED 4025.....	3
HLED 4110	3
HLED 4120.....	3
HLED 4130.....	3
PSYC 2210 or HLED 4030	3

IV. Affiliated Options

The Division of Kinesiology and Health offers two options for the general undergraduate population. They require course work beyond degree requirements.

A. Athletic Coaching Endorsement/Permit

Students who wish to qualify for an athletic coaching permit to coach in Wyoming public schools must complete four courses. Note: Endorsements are for current teachers. Permits are for those who are not a licensed educator. CPR Certification

KIN 3050.....	2
KIN 4090.....	3
Coaching in... Experience (completed at a community college or complete a coaching experience in a specific sport for one season or more with a letter written by your supervising coach to submit with your PTSB endorsement application form)	

B. School Health Education K-12

In addition to completing a bachelor's degree in teaching at the secondary level from an approved university program, 25 credit hours are required to be endorsed to teach health education K-12 in the public schools of Wyoming.

FCSC 1141.....	3
HLED 1006.....	3
CPR Certification	
HLED 4120.....	3
HLED 4025.....	3
HLED 4110	3
HLED 4130.....	3
PSYC 2210 or HLED 4030	3

Graduate Study

Program Specific Admission Requirements

Admissions into the M.S. degree program is open to people who have obtained an undergraduate degree with a major program of study in exercise and sport science, health, kinesiology, physical education, or other area in human movement sciences. Students who do not have a bachelor's degree in kinesiology, physical education or health are required to complete four undergraduate courses in kinesiology and/or health in addition to the courses required for the graduate program of study. Individuals interested in applying are encouraged to contact the Graduate Program Coordinator, Dr. Tucker Readdy (tucker.readdy@uwyo.edu) for more information.

In order to apply, please submit the following via the University of Wyoming's online application system (www.uwyo.edu/admissions/apply.html): K&H supplemental application, copies of GRE scores, transcripts, a sample of professional writing, and three letters of recommendation. Applications must be submitted no later than February 1 to be considered for Fall admission; Spring admissions are also considered on a case by case basis.

GRE scores are required for admission but can be waived in specific situations. A minimum of a 3.000 undergraduate cumulative GPA is also necessary for admission. International students who are not native English speakers must submit TOEFL or IELTS scores. If an international applicant wishes to be considered for Graduate Assistantship funding, the applicant should also submit the results of an Oral Proficiency Inter-view (OPI). Please contact the UW English Language Center (www.uwyo.edu/ele/) if you have questions regarding English proficiency requirements.

Please see the Graduate Admissions and Graduate Student Regulations and Policies in the front section of the UW Catalog for more information.

Program Specific Graduate Assistantships

Graduate assistantships are available on a competitive basis. Teaching opportunities exist within the laboratory portions of the human anatomy and exercise physiology courses, the teaching laboratory portions of the pedagogy practical courses, and HLED 1006, Personal Health. A graduate assistantship also involves some research opportunities with assigned graduate faculty advisors.

A stipend for a full time graduate assistant is \$12,333.00 per academic year. Tuition and fees are covered according to the percentage of assistantship allocated to the student.

Program Specific Degree Requirements Master's Programs

M.S. in Kinesiology and Health
Area of Emphasis: Exercise and Sport Science (ESS)
Plan A (thesis)

The Plan A option of the Master of Science degree in the area of ESS is designed to prepare student for careers in one of the subdisciplines within ESS (e.g., biomechanics, exercise and sport psychology, motor learning and control, physical activity and lifespan development, physical activity and nutrition, physical activity

and obesity, etc.). All students complete a series of general required courses and a concentration of courses in their specific ESS subdiscipline.

The ESS area of emphasis involves a minimum of thirty (30) credit hours of coursework, a thesis, and a final oral examination. At least twenty-five (25) credit hours of coursework is required from the Division of Kinesiology and Health (i.e., HLED and KIN courses), which includes the ten (10) hours of general required courses.

I. General Required Courses (10 credits)

- KIN 5085, Research Methods in Physical Education (3 credits)
- KIN 5960, Thesis Research (4 credits)
- STAT 5050¹, Statistical Methods for the Biological Sciences (3 credits)

¹May substitute STAT 5060, 5070, or 5080; or EDRE 5600 or EDRE 5640. Decision made in conjunction with advisor.

II. Specialized Required Courses (9-15 credits)

Area of specialization will include three to five courses (9-15 hours) within the student's chosen ESS subdiscipline. Your advisor will identify courses to be taken specific to the selected area of emphasis.

III. Elective Courses (minimum 6 credits)

Students are encouraged to complete at least one of their elective course selections from outside the Division of Kinesiology and Health. All elective course decisions must be made in conjunction with your advisor.

Contributions of Independent Study, Practicum/Internship, and 4000 Level Coursework to M.S. Degree Program

1. Independent Study Coursework: Maximum of 3-credit hours of Individual Problems (HLED/KIN 5097) or Special Problems (HLED/KIN 5587) may contribute to the 25 credit hours from the Division of Kinesiology and Health.
2. Practicum/Internship Coursework: Maximum of 3-credit hours of Practicum in College Teaching (KIN 5900) or Internship (KIN 5990) may contribute to the 25 credit hours from the Division of Kinesiology and Health.
3. 4000 Level Coursework: Maximum of two 4000 level courses (3 or 4 credit hours each) may contribute to the 25 credit hours from the Division of Kinesiology and Health.

M.S. in Kinesiology and Health
Area of Emphasis: Health (HLED)
Plan A (thesis)

The Plan A option of the Master of Science degree in the area of HLED is designed to prepare student for careers in public and community health settings. All students complete a series of general required courses and a concentration of courses in the area of HLED.

The HLED area of emphasis involves a minimum of thirty (30) credit hours of coursework, a thesis, and a final oral examination. At least twenty-one (21) credit hours of coursework is required from the Division of Kinesiology and Health (i.e., HLED and KIN courses), which includes the ten (10) hours of general required courses.

I. General Required Courses (10 credits)

- KIN 5085, Research Methods in Physical Education (3 credits)
- KIN 5960, Thesis Research (4 credits)
- STAT 5050¹, Statistical Methods for the Biological Sciences (3 credits)

¹May substitute STAT 5060, 5070, or 5080; or EDRE 5600 or EDRE 5640. Decision made in conjunction with advisor.

II. Specialized Required Courses (9-15 credits)

Coursework will include three to five courses (9-15 hours). Your advisor will identify courses to be taken.

III. Elective Courses (minimum 6 credits)

Students are encouraged to complete at least one of their elective course selections from outside the Division of Kinesiology and Health. All elective course decisions must be made in conjunction with your advisor.

Contributions of Independent Study, Practicum, and 4000 Level Coursework to M.S. Degree Program

1. Independent Study Coursework: Maximum of 3-credit hours of Individual Problems (HLED/KIN 5097) or Special Problems (HLED/KIN 5587) may contribute to the 25 credit hours from the Division of Kinesiology and Health.
2. Practicum Coursework: Maximum of 3-credit hours of Practicum in College Teaching (HLED 5900) may contribute to the 21 credit hours from the Division of Kinesiology and Health.
3. 4000 Level Coursework: Maximum of two 4000 level courses (3 or 4 credit hours each) may contribute to the 21 credit hours from the Division of Kinesiology and Health.

M.S. in Kinesiology and Health
Area of Emphasis: Physical Education Teacher
Education (PETE)
Plan A (thesis)

The Plan A option of the Master of Science degree in the area of PETE is designed to prepare student for careers in the science and practice of teaching human movement. All students complete a core of general required courses and a concentration of courses in the area of PETE.

The PETE program of studies involves a minimum of thirty (30) credit hours of coursework, a thesis, and a final oral examination. At least twenty-five (25) credit hours of coursework is required from the Division of Kinesiology and Health (i.e., HLED and KIN courses), which includes the ten (10) hours of general required courses.

I. General Required Courses (10 credits)

- KIN 5085, Research Methods in Physical Education (3 credits)
- KIN 5960, Thesis Research (4 credits)
- STAT 5050¹, Statistical Methods for the Biological Sciences (3 credits)

¹May substitute STAT 5060, 5070, or 5080; or EDRE 5600 or EDRE 5640. Decision made in conjunction with advisor.

II. Specialized Required Courses (12 credits selected from the following KIN courses)

- KIN 5012, Curriculum Design in Physical Education (3 credits)
- KIN 5013, Spectrum of Teaching Styles (3 credits)
- KIN 5014, Teaching Tactics in Sport-based Physical Education (3 credits)
- KIN 5016, Analysis and Supervision of Teaching in Physical Education (3 credits)
- KIN 5018, Psychology of Teaching Physical Education (3 credits)
- KIN 5019, Instructional Models for Physical Education (3 credits)

III. Elective Courses (minimum 8 credits)

Students are encouraged to complete at least one course from outside the Division of Kinesiology and Health. All elective course decisions must be made in conjunction with your advisor.

Contributions of Independent Study, Practicum/Internship, and 4000 Level Coursework to M.S. Degree Program

1. Independent Study Coursework: Maximum of 3-credit hours of Individual Problems (HLED/KIN 5097) or Special

Problems (HLED/KIN 5587) may contribute to the 25 credit hours from the Division of Kinesiology and Health.

2. Practicum/Internship Coursework: Maximum of 3-credit hours of Practicum in College Teaching (KIN 5900) or Internship (KIN 5990) may contribute to the 25 credit hours from the Division of Kinesiology and Health.

3. 4000 Level Coursework: Maximum of two 4000 level courses (3 or 4 credit hours each) may contribute to the 25 credit hours from the Division of Kinesiology and Health.

M.S. in Kinesiology and Health
Plan B (paper and experiential learning option)

The Plan B option of the Master of Science degree in Kinesiology and Health is designed to prepare students who are seeking a terminal degree. This option is not designed for students seeking to pursue a doctoral degree at the completion of the Master of Science degree in Kinesiology and Health.

This program involves a minimum of thirty (30) credit hours of coursework and a culminating paper or case study presentation (experiential learning option) that is developed on a topic selected by the student in conjunction with her or his graduate faculty advisor. The process for composing the culminating paper or case study includes the development of a prospectus and final presentation of the paper or case study; students who elect the experiential learning option will also be required to complete three (3) credits of KIN 5990 (Internship). At least twenty-five (25) credit hours of coursework is required from the Division of Kinesiology and Health (i.e., HLED and KIN courses), which includes the nine (9) hours of general required courses.

I. General Required Courses (10 credits)

- KIN 5080, Investigations in Kinesiology and Health (3 credits)
- KIN 5085, Research Methods in Health and Physical Education (3 credits)
- STAT 5050¹, Statistical Methods for the Biological Sciences (3 credits)

¹May substitute STAT 5060, 5070, or 5080; or EDRE 5600 or EDRE 5640. Decision made in conjunction with advisor.

II. Elective Kinesiology and Health Courses (minimum of 15 credits)

III. Elective Courses (minimum of 6 credits)

At least one elective course (3 hours) must be taken from outside the Division of Kinesiology and Health. All elective course decisions must be made in conjunction with your advisor.

Contributions of Independent Study, Practicum/Internship, and 4000 Level Coursework to M.S. Degree Program

1. Independent Study Coursework: Maximum of 3-credit hours of Individual Problems (HLED/KIN 5097) or Special Problems (HLED/KIN 5587) may contribute to the 25 credit hours from the Division of Kinesiology and Health.

2. Practicum/Internship Coursework: Maximum of 3-credit hours of Practicum in College Teaching (HLED/KIN 5900) or Internship (KIN 5990) may contribute to the 25 credit hours from the Division of Kinesiology and Health.

3. 4000 Level Coursework: Maximum of two 4000 level courses (3 or 4 credit hours each) may contribute to the 25 credit hours from the Division of Kinesiology and Health.

M.S. in Kinesiology and Health Distance
Education Program
Plan B (paper)

General Information

Health and physical education teachers and health professionals are busy people. Health professionals typically work at their job during the day and then volunteer their time to work with community health care agencies/groups in the evening and weekends. Teachers of health and physical education typically teach throughout the day and coach during the evenings and weekends. Therefore, traditional Master's degree programs that require students to attend the University of Wyoming in Laramie are often simply impossible for teachers and other health professionals to fit into their busy schedule.

The Division of Kinesiology and Health offers the Master of Science degree in Kinesiology and Health as an off-campus, distance education program. This means that you can complete the 30-credit hour course requirements for a Master of Science degree from the comfort of your community as you continue working in your current profession. All courses are delivered to your home via a combination of teleconferencing, pre-developed videotapes, and/or online. The distance education program is designed such that you can complete the Master of Science degree in a three, four, or five year period of time.

This program involves a minimum of thirty (30) credit hours of coursework and a culminating paper or case study presentation (experiential learning option) that is developed on a topic selected by the student in conjunction with her or his graduate faculty advisor. The process for composing the culminating paper or case study includes the development of a prospectus and final presentation of the paper or case study; students who elect the experiential learning option will also be required to complete three (3) credits of KIN 5990 (Internship). At least twenty-five (25) credit hours of coursework is required from the Division of Kinesiology and Health (i.e., HLED and KIN courses), which includes the nine (9) hours of general required courses.

I. General Required Courses (9 credits)

- KIN 5080, Investigations in Kinesiology and Health (3 credits)
- KIN 5085, Research Methods in Health and Physical Education¹ (3 credits)
- EDRE 5600/5640, Educational Research I or Introduction to Qualitative Research (3 credits)

¹May substitute EDRE 5530

II. Kinesiology and Health Electives (15 credits)

III. Elective Courses (6 credits)

At least one elective course (3 hours) must be taken from outside the Division of Kinesiology and Health. All elective course decisions must be made in conjunction with your advisor.

Contributions of Independent Study, Practicum/Internship, and 4000 Level Coursework to M.S. Degree Program

1. Independent Study Coursework: Maximum of 3-credit hours of Individual Problems (HLED/KIN 5097) or Special Problems (HLED/KIN 5587) may contribute to the 21 credit hours from the Division of Kinesiology and Health.
2. Practicum/Internship Coursework: Maximum of 3-credit hours of Practicum in College Teaching (HLED/KIN 5900) or Internship (KIN 5990) may contribute to the 21 credit hours from the Division of Kinesiology and Health.

3. 4000 Level Coursework: Maximum of two 4000 level courses (3 or 4 credit hours each) may contribute to the 21 credit hours from the Division of Kinesiology and Health.

Physical Education Activity (PEAC)

Program activity-theory courses for men and women. All activity classes are offered for S/U grade only, with the exception of 2000. Physical education activity courses may not be offered every semester.

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1001. Physical Activity and Your Health. 1. [P◀▶(none)] Designed to help students gain an understanding of the impact physical activity or inactivity has on their health. Students gain the knowledge, skills, and experience that enable them to make informed decisions about their own health as it relates to their quality of life and longevity. **NOTE:** All students must enroll in a PEAC 1001 activity as part of the PEAC 1001 experience.

2000. Wellness: Physical, Nutrition, and Lifestyle Concepts. 1-3 (Max. 9). Designed to present information on topics including (but not limited to): nutrition, mobility and injury prevention, sleep and stress management, sport psychology, ethics in sport and human performance, and methods of fitness. Also includes a physical activity component. Offered as S/U.

Kinesiology (KIN)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1006. Introduction to Kinesiology and Health. 1. A survey of the disciplines of kinesiology and health and exposure to foundational literature in the field. *Prerequisite:* Declared Kinesiology & Health Promotion major or permission of instructor.

1040. Contemporary Topics in North American Sport. 3. [CH,D◀▶(none)] An introductory course that focuses on sport as an institution in North American society. A range of topics is explored from diverse perspectives (historical, sociological, psychological, political, and gender theories), so learners can critically examine what it means to be a part of "sport" in contemporary North American society.

1101. First-Year Seminar. 3. [(none)◀▶FYS]

2000 [PEPR 2000]. Movement Core I: Striking/Fielding and Invasion Games. 2. Exposes students to skill and tactical themes comprising striking/fielding and invasion games. Course aims for students' ability to understand, demonstrate and analyze the different offensive and defensive tactics that facilitate game play success in invasion (soccer, tag rugby, basketball) and striking/fielding (softball, cricket) games. *Prerequisite:* sophomore standing.

2001 [KIN 1025, PEPR 1025]. Movement Core II: Net and Target Games. 2. Exposes students to skill and tactical themes comprising net and target games. Course aims for students' ability to understand, demonstrate and analyze different offensive and defensive tactics facilitating game play success in net (volleyball, tennis, badminton) and target (archery) games. *Prerequisite:* sophomore standing.

2003 [KIN 1000, PEPR 1000]. Movement Core IV: Educational Games and Gymnastics. 2. To provide pre-service teachers (PTs) with the skills and knowledge necessary to teach educational games and gymnastics to public school students. *Prerequisite:* sophomore standing.

2004 [KIN 3025, PEPR 3025]. Movement Core V: Fundamental Motor Skills, Creative Movement, and Dance. 3. [CA◀▶(none)] Designed for prospective physical education teachers K-12. Fundamental motor skills, dance, and creative movement and the associated teaching behaviors needed to teach this content to K-12 learners is the focus of this course. *Prerequisite:* Sophomore standing.

2005 [KIN 2025, PEPR 2025]. Movement Core VI: Physical Fitness and Physical Activity 2. Designed for prospective school-based physical and health education teachers K-12. Focuses on five primary content areas: what is fitness education and why do we need it; development of content-based fitness curriculum; teaching cognitive aspects of fitness education; teaching physical aspects of fitness education; and promoting fitness education. *Prerequisite:* sophomore standing.

2010 [PEPR 2010]. Field Experience for Prospective Elementary and Secondary Teachers. 1-4 (Max. 4). Provides initial experience in the public school setting. Full-time assignment of one to four weeks in a public school under supervision of a certified teacher. Students serve as teacher aides.

2040 [PEPR 2040]. Human Anatomy. 3. [SB◀▶(none)] Study of human structure in terms of its microscopic and gross anatomy. Provides students with adequate background to study human physiological function. The

corresponding course, to be taken concurrently, is KIN 2041. *Prerequisite:* LIFE 1000, LIFE 1003, LIFE 1010, or ANTH 1100.

2041 [PEPR 2041]. Human Anatomy Laboratory. 1. [SB◀(none)] A laboratory study of human structure in terms of human microscopic and gross anatomy. This laboratory course is designed to provide students with an adequate background to study human physiology and kinesiological function. *Prerequisite:* KIN 2040 or concurrent enrollment in KIN 2040.

2050. Socio-Cultural Aspects of Physical Activity, Exercise and Sport. 3. [(none)▶H] This course examines the role of physical activity, exercise and sport in the promotion of individual and collective physical health and wellness. Students will understand the historical, individual, socio-cultural, environmental and political factors that have shaped the role of these behaviors in contemporary U.S. society. *Prerequisites:* Completion of an FYS course, COM1.

2900. Topics In: __. 1-3 (Max. 3). Course Topics could include Peer Health Education, Current Issues in Health, etc. *Prerequisite:* sophomore standing.

3010 [PEPR 3010]. Fundamentals of Health and Fitness Assessment. 3. Fundamental concepts of health appraisal, assessment of health-related fitness levels, individual and group exercise programming and leadership, and methods of behavioral change. Theory and practical application of fitness presented with an emphasis on adults. Has lecture and lab components. Completion of KIN 3021 highly recommended. *Prerequisites:* completed or concurrent enrollment in KIN 3021; 2.700 GPA.

3011 [PEPR 3011]. Teaching Methods in Physical Education K-12. 3. Develops knowledge, skills and understandings appropriate to successful participation in a class setting when functioning in the teaching role. *Prerequisites:* grade of C or better in KIN 3012; concurrent enrollment in KIN 3015 and KIN 4080.

3012 [PEPR 3012]. Teaching Laboratory I. 3. [(none)▶COM2] Provides the opportunity to develop skills and acquire knowledge needed to teach physical education. Allows the opportunity for students to evaluate the motor status and progress of a preschool aged child, as well as plan and implement a developmentally appropriate motor program. *Prerequisite:* Admitted to PHET program. (Offered fall semester)

3015 [PEPR 3015]. Teaching Laboratory II. 3. [WC▶(none)] Provides pre-service physical education teacher with skills, knowledge and principles of teaching through application

of peer teaching and small group elementary school teaching. Emphasizes and practices program development, lesson planning and development of a physical education teaching unit. *Prerequisites:* grade of C or better in KIN 3012; concurrent enrollment in KIN 3011, KIN 4080. (Offered spring semester)

3020 [PEPR 3020]. Observational Experience in Movement Science. 1-2 (Max. 6). Provides students with off-campus opportunity to observe professionals in the work place. Emphasis is placed on physical or occupational therapy. Conducted under supervision and arranged by coordinator of undergraduate programs. Offered S/U only. *Prerequisites:* sophomore standing, declared KIN or PHET major, consent of coordinator of undergraduate programs.

3021 [PEPR 3021]. Physiology of Exercise. 3. Applies physiological principles to human physical activities. Emphasizes interaction of neuromuscular, circulatory, and respiratory mechanisms as affecting, and affected by, immediate exercise situations and physical training. Students who are not K&H or PHET majors may be allowed to register with permission of the instructor. *Prerequisites:* 2.750 GPA. For Kinesiology & Health majors: grade of C or better in MATH 1400/1405/1450, KIN 2040, KIN 2041, and ZOO 3115. Or declared PHET major with the following courses completed: MATH 1400/1405/1450, KIN 2040, KIN 2041, and ZOO 3115.

3022. Lab Exp in Exercise Physiology. 1. An in-depth examination of the measurement of physiological principles and mechanisms related to human movement. Lab exercises emphasize skills necessary for basic morphological through advanced exercise performance testing variables. Laboratory writing exercises focus on improving students' ability to read and comprehend scientific articles and produce scientific writing based on their own experiments and data. *Prerequisite:* KIN 3021 or concurrent enrollment.

3034 [PEPR 3034]. Lifespan Motor Development. 3. Studies lifespan motor development. Emphasizes developmental periods of infancy through adolescence. Gives attention to observation and analysis of motor behavior and movement performance of individuals across lifespan. *Prerequisites:* grade of C or better in PSYC 1000; junior standing; 2.750 GPA.

3037 [PEPR 3037]. Sport Psychology. 3. Studies psychological theories and techniques applied to sport to enhance the performance and personal growth of athletes and coaches. Emphasizes the influence of personality, anxiety, motivation, social factors, and psychological skills training. *Prerequisite:* Admitted

to the last two years of one of the programs in DK&H. *Prerequisites:* grade of C or better in PSYC 1000; concurrent enrollment in or completion of KIN 3021; 2.750 GPA.

3038. Exercise Psychology. 3. Studies psychological theories for understanding and predicting health-oriented exercise behavior, including psychological intentions for increasing exercise participation and adherence. Emphasizes psychological and psychobiological responses to exercise. *Prerequisites:* grade of C or better in PSYC 1000; concurrent enrollment in or completion of KIN 3021; 2.750 GPA.

3040 [PEPR 3040]. Teaching Human Anatomy. 3. Students develop communication and teaching skills while expanding their knowledge in anatomy. Under faculty instruction, each student develops lecture and laboratory lessons for all human anatomy systems. Under direct faculty supervision, each student demonstrates their teaching skills through preparation of videotape segments and actual laboratory teaching experience in the lower-division human anatomy course. *Prerequisites:* 2.750 GPA and grade of B or better in KIN 2040 and consent of instructor.

3042 [PEPR 3042]. Biomechanics of Human Movement. 3. Introduces fundamental principles of human movement. Includes study and elementary analysis of human motion based on anatomical and mechanical principles. *Prerequisites:* grade of C or better in PHYS 1050 or 1110 or 1210 or 1310; completion of KIN 2040; and minimum 2.750 GPA.

3044. Concepts in Physical Therapy. 2. Introduce and expand student knowledge of physical therapy. Designed for students interested in applying to Physical Therapy (PT) school. Content includes history of PT, therapist role in healthcare, trends in PT education, and effective communication (written and verbal) to support and prepare for the PT application process. *Prerequisite:* concurrent enrollment in or completion of KIN 3021 or permission of instructor.

3050 [PEPR 3050]. Prevention and Care of Athletic Injuries. 2. Encompasses theory and practical work in the field of athletic training. Strongly emphasizes prevention and care of athletic injuries, including wrapping and taping techniques. *Prerequisites:* junior standing; C or better in KIN 2040; minimum 2.750 GPA; or permission of instructor.

3052 [PEPR 3052]. Rehabilitation of Athletic Injuries. 3. Provides a foundation of appropriate rehabilitation principles and techniques based on current research/rationale. The scope is inclusive of approaches applicable

to common sports medicine problems. *Prerequisites:* junior standing; C or better in KIN 2040; and minimum 2.750 GPA.

3058 [PEPR 3058]. Therapeutic Modalities for the Athletic Trainer. 3. Provides the prospective athletic trainer with the knowledge and skill necessary to use therapeutic modalities for the health care of the physically active. *Prerequisites:* junior standing; C or better in KIN 2040; and minimum 2.750 GPA.

3060. Understanding Skill Acquisition for Teaching. 3. Addresses practical questions specific to teaching physical activity - who are my students, what skills am I teaching, how do I teach skills effectively? Examine such concepts as individual differences, nature of motor skills, content and structure of skill practice, and the art of giving feedback. *Prerequisites:* C or better in PSYC 1000; junior standing; declared major in KHP or PHET; 2.750 GPA; or permission of instructor.

3068. Athletic Training Clinical III. 2. Provides clinical and field experience for the athletic training student. Skill and knowledge learned in KIN 2057 and 2058 are applied in the clinical and field settings. *Prerequisites:* KIN 2058 and 2078; concurrent enrollment in KIN 3052; minimum GPA of 2.500.

4001 [PEPR 4001]. Short Course in Physical Education for Undergraduates. 1-6 (Max. 6). Highlights special topics in kinesiology at the undergraduate level, based on need. Maximum allowable credit is 6 semester hours. Offered S/U only. *Prerequisites:* junior status; declared major in KHP or PHET; consent of undergraduate program coordinator.

4010. Pediatric Exercise Physiology. 3. This course will examine the physiological effects of acute and chronic exercise on the pregnant woman, fetus, child, and adolescent. This course is also suitable as a supplemental course for master's students in physical education teaching. *Prerequisite:* KIN 3021.

4012 [PEPR 4012]. Curriculum Development in Physical Education. 3. Focuses on the design of K-12 school physical education programs. It provides opportunities to study alternative curriculum models, engage in the process of curriculum design, and examine policy and theoretical issues of concern to curriculum designers. *Prerequisites:* grade of C or better in KIN 3011, 3015 and 4080. (Offered fall semester)

4013. School Administration for the Health Sciences. 2. Provides teaching majors with information about staff-administrator relationships in school settings. Topics include principles of leadership, school organization and culture, legal issues, financial issues, build-

ing and facilities management. *Prerequisites:* grade of C or better in KIN 3011, KIN 3015, KIN 4080.

4015 [PEPR 4015]. Internship Experience in Kinesiology. 1-12 (Max. 12). Variable-credit (1-12) and S/U course required of Kinesiology and Health undergraduate majors to provide experiential learning in kinesiology and health in a real world setting. Intended to integrate theory and technique with practical application to expose students to areas of professional/career interest and assist with building professional careers. Must have CPR/AED/1st Aid Certification prior to enrollment. Background check must be completed prior to start of course. Cross listed with HLED 4015. *Prerequisites:* Grade of C or better in KIN 3010; 2.750 GPA; completion of a minimum of 18 credits in KIN/HLED upper division coursework.

4016. Research Experience in Kinesiology and Health. 1-6 (Max. 6). Offered to students who wish to gain a research experience in Kinesiology and Health. Meant for students who are interested in pursuing an advanced degree. Students may choose to complete KIN/HLED 4016 instead of KIN/HLED 4015. Must have CPR/AED/1st Aid certification prior to enrollment. Background check must be completed prior to start of course. Cross listed with HLED 4016. *Prerequisites:* minimum sophomore standing; declared KHP major; permission of instructor; 2.750 GPA.

4017 [PEPR 4017]. Teaching Laboratory III. 3. Focuses on the application of teaching skills and the effective utilization of sport-based curricular and instructional models in the secondary public school setting. *Prerequisites:* grade of C or better in KIN 3011, 3015, and 4080; 2.750 minimum cumulative GPA; concurrent enrollment in KIN 4012. (Offered fall semester)

4020. Motor Behavior. 3. Provides undergraduate majors in kinesiology and health the foundation of motor learning and control theories to be applied to decisions related to the enhancement of human performance. *Prerequisites:* C or better in PSYC 1000; concurrent enrollment in or completion of KIN 3021; and 2.750 GPA.

4024. Physical Activity Epidemiology. 3. This course will examine physical activity from a public health perspective. Topics include study design, critical appraisal of research, assessment of physical activity, relationships between physical activity and health outcomes, and current issues in physical activity epidemiology. Dual listed with KIN 5024. *Prerequisite:* completion of KIN 3021 and minimum 2.750 GPA.

4025. Functional Movement Analysis. 3. Synthesize foundational kinesiology knowledge to analyze functional movement patterns and increase theoretical and practical knowledge necessary to obtain Functional Movement Screen certification. Integration of core kinesiology and biomechanics concepts to a human movement model. Opportunities and emphasis on basic fundamental movements and applying acquired skills in practical experiences. *Prerequisite:* Completion of KIN 3021 and minimum 2.750 GPA.

4029 [PEPR 4029]. Methods of Training and Conditioning. 3. Gives students knowledge and experience needed to develop and lead exercise training programs. Of interest to teachers, coaches and fitness leaders. *Prerequisites:* Completion of KIN 3021 and minimum 2.750 GPA.

4042. Advanced Biomechanics. 3. Provides understanding of biomechanical theories and the application of biomechanical measurements to human movement in sports, training, and rehabilitation. Emphasis on using equipment to collect biomechanical data to answer research and clinical questions. Lecture and data collection topics include electromyography, force, balance, kinematics, and kinetics. *Prerequisites:* C or better in KIN 3042, minimum 2.750 GPA.

4055 [PEPR 4055]. Adapted Physical Education. 2. Presents skills necessary to plan, implement and evaluate individualized physical education programs in the least restrictive environment. Acquaints students with current laws, characteristics, assessment instruments and nationally validated programs in physical education for the disabled child. *Prerequisite:* KIN 3012. (Offered spring semester)

4056 [PEPR 4056]. Advanced Exercise Testing and Prescription. 4. Teaches foundational electrocardiography to perform graded exercise stress tests (GXT), performance of GXT's to healthy and diseased populations based on a health appraisal assessment. Knowledge used to develop comprehensive exercise prescriptions, make metabolic calculations. Emphasis on how physical activity, nutrition/weight management, and behavioral factors interact with exercise programming. Student must have CPR certification prior to first day of class. Dual listed with KIN 5056. *Prerequisites:* C or better in KIN 3021 and KIN 3010; and minimum 2.750 GPA.

4062. Applied Concepts in Human Aging. 3. Designed to integrate and apply concepts acquired in core KIN and HLED courses (e.g. human physiology, exercise physiology, health promotion, etc.) to older/aging adults.

Age-related pathologies will be presented and discussed. *Prerequisites:* Completion of KIN 3010 and minimum 2.750 GPA.

4065 [PEPR 4065]. Resources in Adapted Physical Education. 2-3 (Max. 3).

Offers flexible credit for students interested in pursuing intensive study of resources for adapted physical education. Required for state endorsement in Adapted Physical Education. *Prerequisite:* grade of C or better in KIN 4055.

4068. Athletic Training Clinical V. 3. Provides clinical and field experience for the athletic training student. Skill and knowledge learned in KIN 3052 and 3058 are applied in the clinical and field settings. *Prerequisites:* KIN 3058 and 3078; concurrent enrollment in KIN 4052; minimum GPA of 2.500.

4074 [PEPR 4074]. Field Studies in _____.

1-6 (Max. 9). Offered only through distance education. Flexible course to accommodate students completing discipline specific and/or interdisciplinary program field studies experiences, e.g., athletic performance, health/fitness application, minor in Outdoor Leadership, National Outdoor Leadership School programs. Cross listed with HLED 4074. Offered for S/U grade only.

4075. Assessment in Adapted Physical Education. 3. Designed to provide an overview of the assessment process in adapted physical education. Developmentally and disability appropriate psychomotor assessments and procedures for administering them are examined. *Prerequisites:* grade of C or better in KIN 4055 and KIN 4080.

4080 [PEPR 4080]. Assessment in Physical Education. 3. [WC♦COM3] Provides prospective teachers with a thorough knowledge of learner assessment as applied to physical education K-12. *Prerequisites:* grade of C or better in KIN 3012. (Offered spring semester)

4086 [PEPR 4086]. Honors Seminar. 2. Independent study. Consists of in-depth application of experimental techniques and materials to appropriate academic areas which directly support students' majors. Offered for S/U grade only. *Prerequisites:* Junior standing; 3.000 cumulative GPA; declared KHP or PHET major; and participation in UW Honors Program.

4090 [PEPR 4090]. Foundations of Coaching. 3. Coaches must be effective teachers, trainers, fund-raisers, recruiters, motivators, administrators, and counselors. The major purpose of this course is to provide future coaches with current information about the eight domains of essential coaching skills identified in the NSSC. These domains include philosophy and ethics, safety and injury prevention, physical conditioning, growth and development, teaching and communication,

sport skills and tactics, organization and administration, and evaluation. Dual listed with KIN 5090. *Prerequisites:* sophomore status and 2.500 cumulative GPA.

4097 [PEPR 4097]. Individual Problems.

1-3 (Max. 6). Provides flexible credit for juniors and seniors who wish to undertake intensive study of a special problem in physical education or kinesiology & health. Offered S/U grade only. *Prerequisites:* Declared KHP or PHET major; junior standing; and 2.750 GPA.

4099 [PEPR 4099]. Student Teaching in Physical Education. 1-16 (Max. 16).

Student teaching is the culminating experience required of all students in teacher education for graduation and recommendation for certification. Consists of full-time assignment of 16 weeks in an approved school station in Wyoming under supervision of an experienced, approved supervising teacher. Offered for S/U grade only. *Prerequisites:* grade of C or better in KIN 4017.

4900. Topics in: ____ 1-3 (Max. 9) The study of current topics not included in more formal course offerings in kinesiology and health. *Prerequisite:* KIN 3021.

5011. Understanding Variation of Human Movement. 3. Reconceptualize the variability of human movement using dynamical system theory as a new theoretical interpretations to the role of variability in motor behavior. Demonstrates how an understanding of variability can enhance the practice of educators, teachers, coaches, physiotherapists, and developmental specialists. *Prerequisite:* graduate standing in KIN or permission of instructor.

5013. Spectrum of Teaching Styles. 3. Explores the range of teaching styles and the appropriateness of their uses. *Prerequisite:* graduate standing in KIN or permission of instructor.

5014. Teaching Tactics in Sport-Based Physical Education. 3. Introduces students to the instructional strategy of the Tactical Games Approach (Mitchell, Oslin, & Griffin, 2006) of teaching sport-based activities in physical education. Emphasis is on planning, implementing, assessing and evaluating the tactical approach within the K-12 physical education context. *Prerequisite:* graduate standing in KIN or permission of instructor.

5015. Instructional Models for Physical Education. 3. This course will introduce students to model-based instruction for physical education (Metzler, 2011). Emphasis will be placed on analyzing, planning, and implementing various instructional models within a K-12 physical education context. *Prerequisite:* graduate standing in KIN or permission of instructor.

5016. Analysis and Supervision of Teaching in Physical and Health Education. 3.

Introduces various evaluative and supervisory techniques which are designed to improve teaching effectiveness and student learning. Emphasis will be placed on utilizing various strategies of evaluation in instructional settings. *Prerequisite:* graduate standing in KIN or permission of instructor.

5018. Psychology of Teaching Physical Education. 3.

Weaves together theory, research, and practical information related to the psychological aspects of teaching physical education. It shows how you can use psychological principles and strategies to manage behavior, motivate students, achieve program goals, and establish a positive learning environment. *Prerequisite:* graduate standing in KIN or permission of instructor.

5024. Physical Activity Epidemiology. 3.

This course will examine physical activity from a public health perspective. Topics include study design, critical appraisal of research, assessment of physical activity, relationships between physical activity and health outcomes, and current issues in physical activity epidemiology. Dual listed with KIN 4024. *Prerequisite:* KIN 3021, graduate standing in KIN or permission of instructor.

5033. Understanding of Variability in Humans. 3.

This course is designed to re-conceptualize the variability of human movement. Using dynamical system theory, a new theoretical interpretation to the role of variability in motor behavior will be discussed to offer insights into the nature and role of variability observed at different levels of movement analysis. *Prerequisite:* graduate standing with experience of taking undergraduate courses in Motor Behavior, Cognitive Psychology, Sport Psychology, or Coaching.

5034. Lifespan Growth and Psychomotor Development. 3.

Takes a scholarly approach to the subject of psychomotor development, with particular emphasis on the theoretical and scientific examination of motor behavior as it changes over time. Emphasis is placed on observing movement and analyzing changes in it. *Prerequisites:* graduate standing in KIN and C or better in KIN 3034 or permission of instructor.

5035. Sociology of Sport. 3.

Study of the social aspects of sport and play. Includes concepts, research studies, and theories related to such topics as politics, economics, crowd behavior, religion, sexual identity and gender, and ethical and moral values related to sport. *Prerequisites:* graduate standing in KIN and a general sociology course.

5038. Advances in Research on Sport Expertise. 3. Examines the science behind the skill acquisition in sport and explores the application of science to optimal training for achieving and retaining elite performance. Different theories will be compared to reveal how “perfection” is made by “practice.” *Prerequisites:* graduate standing in KIN or permission of instructor.

5039. Perception and Action in Motor Skills. 3. For graduate students who have general interest in understanding how the human perceptual system is coping with the human action system in performing skilled motor tasks. An overview of the existing theories and studies in the field will be provided with sufficient breadth and depth. *Prerequisite:* graduate standing in KIN or permission of instructor.

5046. Applied Biomechanics and Programming. 3. Understand advanced biomechanical theories and utilize MATLAB programming to perform signal process and calculate 3-dimensional ground reaction force, center of pressure, electromyography, and 2-dimensional and 3-dimensional kinematics and kinetics. Emphasize on computational biomechanics and code writing in MATLAB. *Prerequisite:* C or better in KIN 3042; graduate standing in KIN or permission of instructor.

5047. Biomechanics in Sports. 3. Understand the biomechanics of selected sports and the procedures to perform biomechanical analysis of sports techniques. Understand the characteristics of different loadings and their effects on human bodies and the biomechanical mechanisms of sports injuries. *Prerequisite:* C or better in KIN 3042; graduate standing in KIN or permission of instructor.

5056. Advanced Exercise Testing and Prescription. 4. Teaches foundational electrocardiography to perform graded exercise stress tests (GXT), performance of GXT's to healthy and diseased populations based on a health appraisal assessment. Knowledge used to develop comprehensive exercise prescriptions, make metabolic calculations. Emphasis on how physical activity, nutrition/weight management, and behavioral factors interact with exercise programming. Student must have CPR/AED/1st Aid certification prior to first day of class. Dual listed with KIN 5056. *Prerequisites:* C or better in KIN 3021 and KIN 3010; graduate standing in KIN; or permission of instructor.

5062. Applied Concepts in Human Aging. 3. Designed to integrate and apply concepts acquired in core KIN and HLED courses (e.g. human physiology, health promotion, etc.) to older/aging adults. Age-related pathologies are

presented and discussed. Dual listed with KIN 4062. *Prerequisite:* graduate standing in KIN or permission of instructor.

5080. Investigations in Kinesiology and Health. 1-3 (Max. 3). Designed to develop Master of Science level graduate students into critical consumers of research. An additional purpose is to develop research skills to the level necessary to complete a master of science Plan B paper. *Prerequisite:* graduate standing in KIN or permission of instructor.

5085. Research Methods. 3. Focuses on methods and techniques for evaluating and conducting research. Potential and completed research problems are analyzed and evaluated. Research processes are reviewed with emphasis on application. Standards for writing literature reviews and research proposals are also emphasized. *Prerequisite:* graduate standing in KIN or permission of instructor.

5086. Qualitative Research Methods. 3. This course presents students with an introduction to qualitative research methods, designs, and analysis. This involves: creation of purpose statement and research questions, development of designs, hands-on data collection, data analysis, and writing up qualitative studies. Issues related to trustworthiness, ethics, credibility, and transferability of qualitative research will be addressed. *Prerequisite:* graduate standing in KIN or permission of instructor.

5090. Foundations of Coaching. 3. Coaches must be effective teachers, trainers, fund-raisers, recruiters, motivators, administrators, and counselors. The major purpose of this course is to provide future coaches with current information about the eight domains of essential coaching skills identified in the NSSC. These domains include philosophy and ethics, safety and injury prevention, physical conditioning, growth and development, teaching and communication, sport skills and tactics, organization and administration, and evaluation. Dual listed with KIN 4090. *Prerequisite:* graduate standing in KIN or permission of instructor.

5097. Individual Problems. 1-3 (Max. 6). Provides flexible credit for students who wish to undertake intensive study of a special problem identified in a regular class. Cross listed with HLED 5097. *Prerequisite:* graduate standing in KIN or permission of instructor.

5536. Sport Psychology. 3. Examines theoretical, research, and professional issues in contemporary sports psychology. Basic research design, including quasi-experimental design are covered, particularly to discuss the outcome studies or proposed applications such as imagery and hypnosis. Development of applied sport psychology and proposed interventions with sport behavior are viewed in relation to

the development of these approaches, related training issues and outcome research. Identical to PSYC 5536. *Prerequisites:* B or better in KIN 3037; graduate standing in KIN, or permission of instructor.

5537. Exercise Psychology. 3. Focuses on key conceptual issues and research in exercise psychology and the application of research findings in a variety of physical activity settings. Specific content areas include psychological benefits of physical activity, exercise adherence, public health and exercise issues, theory, and determinants of physical activity, interventions for adoption and maintenance, and professional ethics. *Prerequisites:* graduate standing in KIN and B or better in KIN 3038 or permission of instructor.

5586. Seminar. 1-6 (Max. 8). Graduate students in kinesiology and health work intensively on current issues and problems, and may pursue specific areas of emphasis. Although a total of 8 hours is permitted under this number, only 6 hours are allowed by the Division of Kinesiology and Health toward a student's graduate program. Cross listed with HLED 5586. *Prerequisite:* graduate standing in KIN or permission of instructor.

5587. Special Problems. 1-6 (Max. 9). Provides a broad perspective through selected reading material and wherever possible the student collects and uses original information in practical school situations. All work is done independently under the direction of a faculty member. As many conferences are held as necessary to assure successful completion of the project. *Prerequisite:* graduate standing in KIN or permission of instructor.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing in KIN or permission of instructor.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy in KIN.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy in KIN.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* graduate standing in KIN or permission of instructor.

5980. Dissertation Research. 1-12 (Max. 48). Graduate level course designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* graduate standing in KIN or permission of instructor.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing in KIN or permission of instructor.

Health Education (HLED)

1006. Personal Health. 3. [(none)◆H] Introduces multiple concepts of personal health (e.g., physical activity, diet, stress, social pressure, public health, human behavior, disease prevention, healthcare access, and health-oriented citizenship) in relation to improving individual health and understanding the health of a society and cultural differences in human health and health behavior.

1221. Standard First Aid and Personal Safety. 1-2 (Max. 2). Studies accident prevention, examination procedures and first aid care for victims of accidents or sudden illness before medical assistance is available. Presents new Red Cross content and CPR. CPR is incorporated in the sections offered for 2 credit hours.

2006. Health for Elementary Educators. 1. Acquaints students to the Wyoming Health Standards and Benchmarks, techniques/instruments for assessing they Wyoming Health Standards and Benchmarks, sample health curriculum models/approaches for elementary school K-6, lesson plans in health education for elementary learners, and health integration in language arts curricula. *Prerequisite:* Declared major in KHP, PHET, or Elementary Education.

3020 [4050]. Community and Public Health. 3. Public health aim to create the conditions where people can be healthy. This course introduces goals and applications of community and public health work in the US, illustrated with case studies from the most urgent health issues facing our nation. *Prerequisites:* HLED 1006, completion of a COM2 course, and minimum 2.750 GPA.

4005. Global Health in Modern Society. 3. Evidence-based approach to understand the interconnectivity of global health in modern society. Examination of health disparities, worldwide, to understand the impact of politics, culture, and economics on population health. Rural aspects of public health both domestically and internationally included. Students will discuss challenges and approaches to improving global public health. *Prerequisites:* sophomore standing and minimum 2.750 GPA.

4015. Internship Experience in Health. 1-12 (Max. 12). Variable-credit (1-12) and S/U course required of Kinesiology and Health undergraduate majors to provide experiential learning in kinesiology and health in a real world setting. Intended to integrate theory and technique with practical application to expose students to areas of professional/career interest and assist with building professional careers. Must have CPR/AED/1st Aid Certification prior to enrollment. Background check must be completed prior to start of course. Cross listed with KIN 4015. *Prerequisites:* Grade of C or better in KIN 3010; 2.750 GPA; completion of a minimum of 18 credits in KIN/HLED upper division coursework.

4016. Research Experience in Kinesiology and Health. 3-6 (Max. 6). Offered to students who wish to gain a research experience in Kinesiology and Health. Meant for students who are interested in pursuing an advanced degree. Students may choose to complete KIN/HLED 4016 instead of KIN/HLED 4015. Must have CPR/AED/1st Aid certification prior to enrollment. Background check must be completed prior to start of course. Cross listed with KIN 4016. *Prerequisites:* minimum sophomore standing; declared KHP major; permission of instructor; and minimum 2.750 GPA.

4020. Food, Health, and Justice. 3. Maps ways our dominant national and global food systems affect health and equity in health, largely though not only negatively. Students will critically assess practiced and potential strategies for creating alternative food systems that support health and equity, particularly at the U.S. community level. Dual listed with HLED 5020. *Prerequisites:* Completed COM 2 course and minimum 2.750 cumulative UW GPA.

4021. Creating Conditions for Community Health. 3. In this course we will analyze and discuss how local, national and international environments impact individual and community health and how to improve health through changes in policy, economic, social, cultural and physical environments. The focus is primarily in the U.S., though students can choose to focus assignments in other contexts. Dual listed with HLED 5021. *Prerequisites:* COM2 and a UW GPA of 2.750 or better.

4025. Teaching Sensitive Issues In Human Sexuality. 3. Prepares educators and other helping professionals whose work involves promoting healthy sexuality in children, young people, and adults. It also provides detailed investigation into important aspects of teaching sensitive issues related to human sexuality. Students practice, critique, develop,

and evaluate sexuality education processes and resources. Dual listed with HLED 5025. *Prerequisites:* Minimum 2.500 GPA; Junior class standing or certified K-12 teacher.

4030. Teaching About Alcohol and Substance Abuse. 3. Introduces students to the issues of societal and personal attitudes towards alcohol and substance use, misuse and abuse. Prepares an educator to teach about alcohol and substance abuse in the classroom and our of the school setting. *Prerequisites:* Sophomore standing; minimum 2.750 GPA; or permission of instructor.

4074. Field Studies in _____. 1-6 (Max. 9). Offered only through distance education. Flexible course to accommodate students completing discipline specific and/or interdisciplinary program field studies experiences, e.g., athletic performance, health/fitness application, minor in Outdoor Leadership, National Outdoor Leadership School programs. Cross listed with KIN 4074. Offered for S/U grade only.

4097. Individual Problems. 1-3 (Max 6). Provides flexible credit for students who wish to undertake intensive study and/or experiential activities in health education. Offered for S/U grade only. *Prerequisite:* Declared major in KHP or permission of instructor.

4110. Teaching Health in Schools K-12. 3. Presented appropriate knowledge and skills to become health literate. Explore ways to teach health skills and knowledge and use assessment strategies for health education. *Prerequisite:* Grade C or better in KIN 3015 or certified K-12 teacher. (Offered fall semester)

4120. Assessment in Health. 3. Provide students with an understanding of components of a balanced assessment system in school health education. Students review the basics of standards-based health education and explore innovations in assessment that provide teachers and students with a more complete and authentic picture of student learning. *Prerequisites:* Minimum 2.500 GPA; concurrent enrollment in KIN 4099 or certified K-12 teacher.

4130. Management of Coordinated School Health Programs. 3. Reviews the coordinated school health program (CSHP) model and identifies research that supports the eight components of the model. Prepares students to advocate for CSHP and to develop the school infrastructure necessary to carry out such a program. Also prepares individuals to work with school from job settings outside the school. Dual listed with HLED 5130. *Prerequisites:* Minimum 2.500 GPA; Junior class standing or certified K-12 teacher. (Offered fall semester)

4900. Topics in: ____ 1-3 (Max. 9) Integrates kinesiology and/or health concepts necessary for graduates in multiple professions. Provides experiential learning and training for success in allied healthcare fields. Students may develop and present projects that relate their education and training to a hypothetical workplace environment. *Prerequisite:* KIN 3021.

5016. Analysis and Supervision of Teaching Physical Education. 3. Students are introduced to various evaluative and supervisory techniques which are designed to improve teaching effectiveness and student learning. Emphasis is placed on utilizing various strategies of evaluation in instructional settings. *Prerequisite:* graduate standing in KIN or permission of instructor.

5020. Food, Health, and Justice. 3. Maps ways our dominant national and global food systems affect health and equity in health, largely though not only negatively. Students will critically assess practiced and potential strategies for creating alternative food systems that support health and equity, particularly at the U.S. community level. Dual listed with HLED 4020. *Prerequisites:* graduate standing or permission of the instructor.

5021. Creating Conditions for Community Health. 3. In this course we will analyze and discuss how local, national and international environments impact individual and community health and how to improve health through changes in policy, economic, social, cultural and physical environments. The focus is primarily in the U.S., though students can choose to focus assignments in other contexts. Dual listed with HLED 4021. *Prerequisite:* graduate standing.

5025. Teaching Sensitive Issues in Human Sexuality. 3. Prepares educators and helping professionals whose work involves promoting healthy sexuality in children, young people and adults. Also provides detailed investigation into important aspects of teaching sensitive issues related to human sexuality. Students practice, critique, develop, and evaluate sexuality education processes and resources. Dual listed with HLED 4025. *Prerequisite:* graduate standing or permission of instructor.

5050. Community and Public Health Promotion. 3. Identifying, understanding, and working with unique needs and assets of communities is emphasized, including ethnic, religious, and social structures. Planning and implementation of community health programs is stressed. Open but not limited to students interested in the following areas: healthcare, health promotion, public health, the schools. *Prerequisite:* graduate standing or permission of instructor.

5085. Research Methods in Health Education. 3. Focuses on methods and techniques for evaluating and conducting research. Potential and completed research problems are analyzed and evaluated. Research processes are reviewed with emphasis on application. Standards for writing literature reviews and research proposals are also emphasized. Cross listed with KIN 5085. *Prerequisite:* graduate standing in KIN or permission of instructor.

5097. Individual Problems. 1-3 (Max. 6). Provides flexible credit for students who wish to undertake intensive study of a special problem identified in a regular class. Cross listed with KIN 5097. *Prerequisite:* graduate standing in KIN or permission of instructor.

5130. Management of Coordinated School Health Programs. 3. Reviews the coordinated program (CSHP) model and identifies research that supports the eight components of the model. Prepares students to advocate for CSHP and to develop the school infrastructure necessary to carry out such a program. Also prepares individuals to work with school from job settings outside the school. Dual listed with HLED 4130. *Prerequisites:* graduate standing or permission of instructor.

5586. Seminar in Health Education. 1-6 (Max. 8). Graduate students in kinesiology and health work intensively on current issues and problems, and may pursue specific areas of emphasis. Although a total of 8 hours is permitted under this number, only 6 hours are allowed by the Division of Kinesiology and Health toward a student's graduate program. Cross listed with KIN 5586. *Prerequisite:* graduate standing in KIN or permission of instructor.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate standing in KIN or permission of instructor.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* graduate standing in KIN or permission of instructor.

Life Sciences Program

114 Aven Nelson Building, (307) 766-2380

FAX: (307)766-2851

Web site: www.uwyo.edu/lifescience

Program Director: Jonathan Prather

The Life Sciences Program consists of all LIFE prefix courses. These courses support a wide range of life science majors and several non-life science majors across campus. The number of LIFE courses taken by students in each major is determined by the departments that offer the majors. The curriculum intends to provide science majors with both breadth and depth in the basic life sciences, and non-science majors with exposure to key concepts in biology and an understanding of the connections between science and society. The program courses also expose students to the fields of cell and molecular biology, genetics, ecology, and evolution, and they familiarize students with the diversity of life on the planet. Courses within the curriculum address four fundamental goals at a level appropriate for each course: 1) Acquisition, Application and Synthesis of Knowledge, 2) Communication Skills, 3) Critical Thinking and Problem Solving, and 4) Research Skills.

For information on LIFE course offerings, please refer to the Life Sciences Program entry in the College of Arts and Sciences.

Division of Medical Education

Family Medicine Residency Programs

Casper: Beth Robitaille, Director

(307) 233-6020

Cheyenne: Ronald L. Malm, Director

(307) 777-7911

Professors:

ALISON DOHERTY, Clinical Professor 2015.

Associate Professors:

LISA K. BRANDES, B.S. Kansas State University 1987; M.D. University of Kansas School of Medicine 1993; Clinical Associate Professor of Family Medicine 2012.

JAMES F. BROOMFIELD, B.S. University of Arkansas 1986; M.D. 1990; Associate Professor of Family Medicine, Cheyenne 2005, 1999.

RONALD L. MALM, B.S. University of Wyoming 1988; D.O. The University of Health Sciences, College of Osteopathic Medicine 1992; Associate Professor of Family Medicine, Cheyenne 2012, 2005, 1999.

DOUGLAS S. PARKS, B.S. Baker University 1978; M.D. University of Kansas 1984; Associate Professor of Family Medicine, Cheyenne 1999, 1993.

BETH ROBITAILLE, B.A. University of Notre Dame 1991; M.D. Creighton University School of Medicine 1995; Clinical Associate Professor of Family Medicine, Casper 2012, 2007, 2002.

STEPHAN N. TRENT, B.A. University of Tennessee 1973; D.O. University of Health Sciences 1980; Clinical Associate Professor of Family Medicine 2007, 2002.

BRIAN M. VEAUTHIER, B.S. University of Notre Dame 1996; M.D. Georgetown University School of Medicine 2001; Clinical Associate Professor of Family Medicine 2012.

Assistant Professors:

KIM R. BROOMFIELD, B.S. University of Wyoming 1987; B.S. 1988; M.D. University of Colorado 1992; Clinical Assistant Professor of Family Medicine Cheyenne 2012, 2009.

WHITNEY A. BUCKLEY, PharmD University of Wyoming 2004; Clinical Assistant Professor 2008.

MARIA A. CORNELIUS, Clinical Assistant Professor 2012.

JANNA CRUMPTON, Pharm.D. Creighton University 2011; Clinical Assistant Professor Cheyenne 2012.

ZACH DEISS, B.A. University of Wyoming 1979; M.D. Creighton University School of Medicine 1987; Clinical Assistant Professor of Family Medicine Casper 2012, 2010.

JOHN P. HEALEY, B.S. University of Wyoming 1979; M.S. University of Utah; M.D. Creighton University 1991; Clinical Assistant Professor of Family Medicine Cheyenne 2012, 2009.

CAROLINE KIRSCH RUSSEL, Clinical Assistant Professor 2012.

ROBERT M. MONGER, B.A. Augustana College 1988; M.D. University of Utah School of Medicine 1992; Clinical Assistant Professor 2008.

DIANE NOTON, B.S. University of Wyoming 1991; M.D. Creighton University 1995; Clinical Assistant Professor of Family Medicine Cheyenne 2009.

SHARON KARNES OLAND, B.S. University of Washington School of Medicine 1997; M.D. University of Washington School of Medicine 2001; Clinical Assistant Professor of Family Medicine Casper 2012.

THOMAS E. RADOSEVICH, B.S. University of Wyoming 1990; M.D. Creighton University School of Medicine 1999; Clinical Assistant Professor of Family Medicine 2012, 2008.

CORA SALVINO, B.S. Purdue University 1975; M.D. Chicago Medical School 1978; Clinical Assistant Professor of Family Medicine Casper 2010.

G. DOUGLAS SCHMITZ, B.S. and M.D. University of Nebraska Medical School 1979; Clinical Assistant Professor 2008.

AMY TRELEASE-BELL, B.S. University of Wyoming 1992; M.D. Creighton University School of Medicine 1996; Clinical Assistant Professor of Family Medicine, Cheyenne 2012, 2004.

CYNTHIA WORKS, Clinical Assistant Professor 2012.

PATRICK A. YOST, B.S. University of Wyoming 1994; M.D. Creighton University 1999; Clinical Assistant Professor of Family Medicine Cheyenne 2012, 2009.

The Division of Medical Education provides opportunities for qualified Wyoming students to pursue careers in medicine; supports both undergraduate and graduate medical education programs; promotes high quality continuing education in medicine and other health care fields for Wyoming providers; facilitates increased accessibility of health and medical services in remote and shortage areas; supports interdisciplinary clinical training; and works closely with the Center for Rural Health Research and Education to promote research and programs to address rural/frontier health delivery concerns.

The University of Wyoming medical contract program enhances medical education opportunities for Wyoming residents. In March 1996, the University of Wyoming became a partner in the WWAMI (Washington, Wyoming, Alaska, Montana, Idaho) Program. As a result, students accepted into the medical contract program attend the University of Washington School of Medicine. The first 18 months of this program are taught on campus at the University of Wyoming. The doctor of medicine degree is awarded by the University of Washington. For further information, contact the Wyoming WWAMI Office, College of Health Sciences, Laramie, Wyoming 82071, (307) 766-2496.

Because of the need for broadly trained primary care physicians in Wyoming, the Wyoming Legislature has established two residency programs in the specialty of family medicine. These two accredited, university-administered, community-hospital based family medicine residency programs are located in Casper and Cheyenne. They enroll up to 42 residents (14 in each of three years). The two family medicine centers are among the most modern and comprehensively equipped facilities of their

kind in the nation and maintain a 1:4 faculty to resident ratio. The program at Casper began in 1976 and is affiliated with Wyoming Medical Center. The program utilized the services and facilities provided by the Community Health Center of Central Wyoming. The Cheyenne program became active in 1980 and is affiliated with United Medical Center. The program utilizes the services and facilities provided by the Veterans Administration and the FE Warren AFB hospitals also located in Cheyenne. Both centers utilize modern design and include spacious examining rooms; treatment and casting rooms; x-ray facilities; offices for faculty, residents and staff; complete laboratories; multiphasic research areas; conference rooms; business offices and roomy waiting rooms with play areas in the clinical component. In the educational component, both include large auditoriums, several classrooms; audio visual production centers; medical libraries; learning resource centers and administrative offices. Particular emphasis in both centers is placed on preparing physicians for rural practice and other facets of medical practice that are unique to Wyoming.

WWAMI Medical Education Program

Laramie: Tim Robinson, Director

(307) 766-2497

Marivern Easton, Assistant Director

(307) 766-6751

Web site: www.uwyo.edu/wwami

Wyoming WWAMI Medical Education Program

FIRST YEAR: Fall		Hrs.
HM	6603.....	2
HM	6610.....	8
HM	6615.....	1
HM	6620.....	7
HM	6700.....	6
Total Hrs.		24

FIRST YEAR: Spring		Hrs.
HM	6602.....	2
HM	6603.....	2
HM	6625.....	1
HM	6630.....	11
HM	6635.....	1
HM	6640.....	3
HM	6650.....	7
Total Hrs.		27

SECOND YEAR: Fall		Hrs.
HM	6602.....	2
HM	6603.....	2
HM	6645.....	1
HM	6800.....	9
HM	6900.....	5
Total Hrs.		19

Graduate Study

The Division of Medical Education provides graduate medical (residency) education for physicians in the specialty of family medicine. The university supports two fully accredited family medicine residency programs in Casper and Cheyenne with a capacity for 42 residents (14 in each of the three years). The Casper program began in 1976 and is affiliated with the Community Health Center of Central Wyoming and the Wyoming Medical Center. The Cheyenne program opened in 1980 and is affiliated with Cheyenne Regional Medical Center. In addition, the Cheyenne program has a close working relationship with the Veterans Administration Hospital. The residency programs are housed in two family medicine centers acclaimed to be among the most modern and comprehensively equipped facilities of their kind in the nation. Particular emphasis is placed on preparing physicians for rural practice and addressing those facets of medical practice that are unique to Wyoming.

In 1996, the University of Wyoming joined the University of Washington's WWAMI Program to provide medical education for the students of Wyoming. Medical students accepted into this program (WWAMI) take their 18 months of classes on campus at the University of Wyoming. Students interested in this program should contact the WWAMI office in the College of Health Sciences at (307) 766-2496.

Human Medicine (HM)

6506. Clinical Preceptorship. 1. Students spend one morning or afternoon per week for approximately 10 weeks in a clinical setting. Students observe the practice of the physician and engage in one on one feedback sessions with the physician. The goal of the experience is to become comfortable in the clinical setting, observe clinical techniques, observe the patient-doctor interactions, and observe the healthcare team. Students should have an opportunity to discuss professional and personal aspects of a particular specialty practice including the business side of the practice. *Prerequisite:* enrollment in or completion of HM 6513, 6522, or 6535.

6510. Microscopic Anatomy: Histology. 4. Lecture/laboratory in microscopic anatomy designed to provide principles/concepts of histology, define morphological characteristics of cells, tissues, organs of human body and relate this information to functional processes studied in concurrent and subsequent courses.

For S/U only. *Prerequisites:* admission to the WWAMI program or consent of instructor and approval of WWAMI coordinator or dean of the College of Health Sciences.

6511. Anatomy and Embryology. 6. Structural organization of human body at the macroscopic level to provide a foundation for physical examination and functional assessment of the human organism. Integrates embryological development with study of cadaver and examination of normal living body. Concentrates on exploration of the body cavities and viscera they contain. For S/U only. *Prerequisites:* admission to the WWAMI program or consent of instructor and approval of WWAMI coordinator or the dean of the College of Health Sciences.

6512. Mechanisms in Cell Physiology. 4. Physiology of cell membrane, ionic and electrical gradients; active transport, excitability, action potentials; biophysics of sensory receptors; neuromuscular transmission; muscle energetics/contractility; spinal reflexes and central synaptic transmission; autonomic nervous system; energy metabolism and temperature regulation; epithelial transport; gastrointestinal motility and secretions. For S/U only. *Prerequisites:* admission to the WWAMI program or consent of instructor and approval of WWAMI coordinator or the dean of the College of Health Sciences.

6513. Introduction to Clinical Medicine. 1. Instruction in communication skills and interview techniques to form the basis for the doctor-patient relationship and for the skills of communication with patients. The patient profile is obtained. Attention to developing comfort in the physician role. For S/U only. *Prerequisites:* admission to WWAMI program or consent of instructor and approval of WWAMI coordinator or dean of the College of Health Sciences.

6514. Biochemistry 1A. 3. First portion of a coordinated course covering classical molecular and cellular biochemistry, cellular physiology and molecular genetics. Metabolic interrelationships as they occur in the individual are stressed and related to disturbances in disease states. For S/U only. *Prerequisites:* admission to WWAMI program or consent of instructor and approval of WWAMI coordinator or the dean of the College of Health Sciences.

6516. Systems of Human Behavior. 3. Sensitizes students to the impact of such factors as emotional and physical development, cultural backgrounds, social roles, families, sexual identities and belief systems upon their effectiveness as physicians. Teaches skills in analyzing behavior, defining behavioral objectives and designing precise treatment

strategies to attain these objectives. For S/U only. *Prerequisites:* admission to WWAMI program or consent of instructor and approval of WWAMI coordinator or the dean of the College of Health Sciences.

6521. Microbiology and Infectious Disease 1A. 4. Pathogenesis and immunity of infectious diseases, natural barriers. Microbiology, epidemiology, clinical manifestations and control of representative bacterial, fungal, parasitic and viral infectious diseases. Chemotherapeutics and principles of chemotherapy. Sterilization, principles of asepsis, nosocomial and iatrogenic infections and their prevention. For S/U only. *Prerequisites:* admission to WWAMI program or consent of instructor and approval of WWAMI coordinator or the dean of the College of Health Sciences.

6522. Introduction to Clinical Medicine. 2. Medical history is introduced and instruction in data collection is begun. Experience in conducting medical interviews with patients to obtain the medical history and patient profile. Special problems related to interviewing are addressed. For S/U Only. *Prerequisites:* admission to WWAMI program or consent of instructor and approval of WWAMI coordinator or dean of the College of Health Sciences.

6523. Introduction to Immunology. 2. Basic concepts such as antigens; antibodies; complement; B- and T-lymphocyte functioning, including interactions with each other and with accessory cells; immunological tolerance; major histocompatibility complex; and role of these basic concepts in immunopathology (immunodeficiencies, hypersensitivities, autoimmunity, blood transfusion, and transplantation). For S/U only. *Prerequisites:* admission to WWAMI program or consent of instructor and approval of WWAMI coordinator or dean of the College of Health Sciences.

6524. Biochemistry 1B. 2. Second portion of a coordinated course covering classical molecular and cellular biochemistry, cellular physiology and molecular genetics. Metabolic interrelationships as they occur in the individual are stressed and related to disturbances in disease states. For S/U only. *Prerequisites:* admission to WWAMI program or consent of instructor and approval of WWAMI coordinator or dean of the College of Health Sciences.

6531. Anatomy of Head and Neck. 4. Gross anatomy (including skull, pharynx and larynx), audition and balance, physiology and clinical evaluation, maxillofacial disorders, diseases of nasal passages, nasopharynx and oropharynx, accessory sinuses. Physical examination. For S/U only. *Prerequisites:* admission to WWAMI

program or consent of instructor and approval of WWAMI coordinator or dean of the College of Health Sciences.

6532. Nervous System. 5. Integrated approach to normal structure and function of the nervous system, including the eye. Neuropathological examples, as well as clinical manifestations of neurological disease are presented. For S/U only. *Prerequisites:* admission to WWAMI program or consent of instructor and approval of WWAMI coordinator or dean of the College of Health Sciences.

6534. Microbiology and Infectious Disease 1B. 2. Pathogenesis and immunity of infectious diseases, natural barriers. Microbiology, epidemiology, clinical manifestations and control of representative bacterial, fungal, parasitic and viral infectious diseases. Chemotherapeutics and principles of chemotherapy. Sterilization, principles of sepsis, nosocomial and iatrogenic infections and their prevention. For S/U only. *Prerequisites:* admission to WWAMI program or consent of instructor and approval of WWAMI coordinator or dean of the College of Health Sciences.

6535. Introduction to Clinical Medicine. 3. Adult screening physical examination is taught through the use of lecture, audiovisual aids, and small group tutorial, where students in supervised setting practice the physical examination on one another. Further practice in the performance and recording of the patient profile and medical history. For S/U only. *Prerequisites:* admission to WWAMI program or consent of instructor and approval of WWAMI coordinator or dean of the College of Health Sciences.

6553. Musculoskeletal System. 5. Gross, surface, applied and X-Ray anatomy of system including entire spine but excluding head and neck. Histology of bone, cartilage, tendon-myotendinal junction and joints. Musculoskeletal trauma and healing. Pathology and clinical manifestations of other degenerative, inflammatory, metabolic, nutritional and congenital disorders. Physical examinations. *Prerequisites:* admission to WWAMI program or consent of instructor and approval of WWAMI coordinator or Dean of the College of Health Sciences.

6590. Medical Information for Decision Making. 1. Evidence Based Medicine (EBM) is now the predominant model by which medicine is practiced. The goal is to forge critical thinking skills and to teach analysis of the medical literature as a tool. *Prerequisites:* admission to WWAMI program or consent of instructor and approval of WWAMI coordinator or dean of the College of Health Sciences.

6602. Introductory Primary and Continuity Care Clerkship. 2. Introduces medical students to continuity of care by working with practicing physicians. The course demonstrates how to work with an individual to help them achieve optimal health, and includes topics in primary and preventative care, geriatrics, rehabilitation, palliative care, behavioral health and pain management. *Prerequisite:* Must be enrolled in the WWAMI Medical Education Program.

6603. Clinical Studies. 2. Instruction in communication skills, interviewing techniques, physical examination, documentation and clinical reasoning. The course will include hospital based patient encounters and developing comfort and introduction to the physical role. *Prerequisite:* Must be enrolled in the WWAMI Medical Education Program.

6610. Molecular and Cellular Basis of Disease. 8. Introduces cell physiology and cell biology, function, genetics, and genetic diseases, genes. Topics include membrane physiology; sensory receptors; muscle energetics and contractibility; autonomic nervous system; tissue response to disease; pharmacodynamics and pharmacokinetics; genetic disorders; pharmacogenetics. Incorporates relevant fundamental principles in anatomy, pathology, and pharmacology. *Prerequisite:* Must be enrolled in the WWAMI Medical Education Program.

6615. Ecology of Health and Medicine Foundations I. 1. This course integrates thematic content with an emphasis on core concepts needed for clinical practice in the changing healthcare environment. Students will explore areas related to humanism in medicine including the themes of diversity, health equity, ethics, professionalism, and determinants of health.

6620. Invaders and Defenders. 7. Systems addressed include the immune system, microbial biology, infectious diseases, inflammation and repair, and skin and connective tissue. Topics discussed include the pathogenesis and immunity of infectious disease, immunodeficiencies, hypersensitivity, autoimmunity, the basis of immunologic diagnostics. Additionally, this course will include relevant fundamental scientific principles in anatomy, pathology, and pharmacology. *Prerequisite:* Must be enrolled in the WWAMI Medical Education Program.

6625. Ecology of Health and Medicine Foundations II. 1. This course integrates thematic content with an emphasis on core concepts needed for clinical practice in the changing healthcare environment. Students will explore areas related to humanism in medicine including the themes of diversity, health equity, ethics, professionalism, and

determinants of health. *Prerequisite:* Must be enrolled in the WWAMI Medical Education Program.

6630. Circulatory System. 11. Provides an interdisciplinary approach to cardiovascular, respiratory, and renal-urinary medicine, including anatomy, physiology, radiology, pathology, medicine, and surgery. Topics include cardiac electrophysiology and cardiac muscle mechanics, myocardial infarction and cardiac repair, thoracic and pulmonary anatomy, ventilatory mechanics, gas exchange, obstructive, restrictive, and pulmonary-vascular diseases, renal function, and common kidney diseases. *Prerequisite:* Must be enrolled in the WWAMI Medical Education Program.

6635. Ecology of Health and Medicine Foundations III. 1. This course integrates thematic content with an emphasis on core concepts needed for clinical practice in the changing healthcare environment. Students will explore areas related to humanism in medicine including the themes of diversity, health equity, ethics, professionalism, and determinants of health. *Prerequisite:* Must be enrolled in the WWAMI Medical Education Program.

6640. Blood and Cancer. 3. Introduces students with the basic pathophysiologic mechanisms leading to disturbances of red cell, white cell, and platelet production, as well as abnormalities of hemostasis presenting clinical problems, with an emphasis on pathophysiology. Additionally, this course will include relevant fundamental scientific principles in anatomy, pathology, and pharmacology. *Prerequisite:* Must be enrolled in the WWAMI Medical Education Program.

6645. Ecology of Health and Medicine Foundations IV. 1. This course integrates thematic content with an emphasis on core concepts needed for clinical practice in the changing healthcare environment. Students will explore areas related to humanism in medicine including the themes of diversity, health equity, ethics, professionalism, and determinants of health. Restricted to WWAMI medical students only.

6650. Energetic and Homeostasis. 7. Integrates discussions of metabolism, nutrition, obesity, diabetes, gastrointestinal/liver physiology and endocrinology, including physiology and pathology of digestion and hepatic function, principles and practice of clinical nutrition, endocrine metabolism, and clinically important endocrine pathophysiology. Relevant anatomy, pathology and pharmacology of the endocrine and gastrointestinal systems will be covered. *Prerequisite:* Must be enrolled in the WWAMI Medical Education Program.

6700. Research Methods. 6. The course will describe various types of medical studies along with the advantages and limitations of each. Students will explore statistical tools related to diagnostic testing, and treatment efficacy. *Prerequisite:* Must be enrolled in the WWAMI Medical Education Program.

6800. Mind, Brain, Behavior. 9. Explains the foundational principles of the organization and function of the head, neck, and central nervous system with a focus on clinical application of this knowledge to systematically approach the differential diagnosis and management of major neurologic, psychiatric, and behavioral disorders. Covers current therapeutic approaches to disease including pharmacological, behavioral, surgical, and other therapies. *Prerequisite:* Must be enrolled in the WWAMI Medical Education Program.

6900. Life Cycles and Reproduction. 5. Covers normal and abnormal human development reproductive functions including formation and maturation of ova and sperm, menstruation, normal pregnancy, and labor and delivery. Provides information concerning infertility, family planning techniques, urinary disorders, and reproductive aging and demography of human population. Includes relevant fundamental scientific principles in pelvic anatomy, pathology, histology, imaging, and pharmacology. *Prerequisite:* Must be enrolled in the WWAMI Medical Education Program.

Microbiology Program

Program Director: Gerard P. Andrews

Phone: (307) 766-3139

FAX: (307) 766-3875

E-mail: gandrews@uwyo.edu

Please see the Microbiology section under the College of Agriculture and Natural Resources for list of faculty and program information.

Fay W. Whitney School of Nursing

351A Health Sciences Center,

(307) 766-4312

FAX: (307) 766-4294

Web site: www.uwyo.edu/Nursing

Dean: Sherrill J. Smith

Associate Dean: TBD

Professors:

PAMELA N. CLARKE, B.S.N. Wayne State University 1969; M.P.H. University of Michigan, Ann Arbor 1971; Ph.D. Wayne State University 1983; Professor of Nursing 2003.

ANN MARIE HART, B.S.N. Medical College of Virginia 1991; M.S. University of Wyoming 1996; Ph.D. University of Colorado Health Sciences Center Denver 2003; Professor of Nursing 2015.

SHERRILL J. SMITH, B.S.N. University of Wisconsin-Eau Claire 1985; M.S. Wright State University 1997; Ph.D. University of Northern Colorado 2008; Professor of Nursing 2019; Dean of Nursing 2019.

Associate Professor:

JENIFER THOMAS, B.S. Colorado State University 1994; M.S. Avila University 2000; M.S. Colorado State University 2007; Ph.D. 2008; Associate Professor of Nursing 2016.

Assistant Professors:

REBECCA CARRON, B.S.N. Texas Christian University 1976; B.A. University of Wyoming 1997; M.S. 2006; Ph.D. University of Colorado 2014; Assistant Professor of Nursing 2014.

SARAH KOOIENGA, B.S.N. Rush University 1983; M.S.N. University of North Carolina at Chapel Hill 1988; Ph.D. Oregon Health Sciences University 2006; Assistant Professor of Nursing 2014.

Clinical Assistant Professor:

ESTHER GILMAN-KEHRER, B.S.N. University of Wyoming 1986; M.S. 1998; D.N.P. University of Colorado 2012; Clinical Assistant Professor 2014.

NANCY MCGEE, B.S.N. University of Wyoming 2005; M.S. 2007; D.N.P. University of Northern Colorado 2014; Clinical Assistant Professor 2015.

J'LAINE PROCTOR, B.S.N. University of Wyoming 2000; M.S. 2003; Certificate-PMHNP 2007; D.N.P. University of Northern Colorado 2014; Clinical Assistant Professor 2014.

Senior Lecturer:

Kimberly Raska-Miller

Associate Lecturers:

K. David Bodily, Elizabeth Goodwin, Marilyn Hall, Sherrie Rubio-Wallace, Candace Stidolph, Rachel Thomas, Candace Tull

Assistant Lecturers:

Paula Belknap, Paula Kihn, Christina Warren

Adjunct and Part-time Faculty:

Amy Aldrich, Nicole Alexander, Jamie Anthony-Mathews, Nikki Armstrong, Tracy Baum, Karen Benjamin, Shelley Benson, Diane Boyle, Colleen Butler, Carol Campbell, Cate Campisi, William T. Carter, Robin Cole, Mary Cox, Denise Curtis, Jennifer Curtis, Robyn Curtis-Rice, Wesley Davis, Kimberly Dono-

hue, Michelle Dowling, Sharon Farra, Jennifer Favilla, James Fleenor, Shelby Frost, Deborah Gaspar, Brian Gee, Julian Good, Grace Gosar, Pete Gosar, Sheriedan Grannan, Nancy Granum, Amy Gruwell, Jennifer Helmer, Jesse Henry, Julie Hummer-Bellmeyer, Barbara James, Dawn Jensen, Amy Johnson, Sunny Kaste, Melanie Kawulok, Katie Keller, Carol Kobulnicky, Cheryl Koski, Kara Laughlin, Anthony Leonard, Susan McLaughlin, Sue Lowe, Katherine Miller, May Nara, Marcia Newell, Brian O'Neill, Jennifer Oiler, Daiva Olipra, Sarah Penn, Collin Prince, Mary Ann Purtzer, Chelsea Raymer, Rasha Riad, Michael Rice, Vickie Richards, Amy Robohm, Lettie Seamount, Marlene Shaw, Cynthia Smith, Shawn Snyder, Veronica Taylor, Cassie Terfehr, Dyan Thompson, Joslyn Thompson, Kate Thompson, Teresa Thompson, Weldonna Toth, Cynthia Weber, Linda Williams, Wendy Wood Neeson, Wendy Wright

Emeriti:

Pamela D. Larsen, Beverly McDermott, Holly Miller, Mary Anne Purtzer, Susan H. Steiner, Beverly Taheri-Kennedy, Fay W. Whitney, Norma Wilkerson

The Fay W. Whitney School of Nursing (FWWSO) has well established B.S.N., M.S., and D.N.P. programs based upon national nursing education standards.

Mission

The FWWSO educates, conducts research and provides service and practice to improve, protect and promote health.

Accreditation and Membership

The baccalaureate and graduate programs are accredited by the Commission on Collegiate Nursing Education (CCNE).

The baccalaureate program (Basic BSN, BRAND) is approved by the Wyoming State Board of Nursing (WSBN). Graduates of the Basic BSN and BRAND options are qualified to apply for admission to the national licensing examination: NCLEX. Graduates of the DNP Program are eligible to take the national certification exams as a nurse practitioner.

Technical Standards for Admission

All nursing students must be able to perform the essential functions of a nurse, including observation/sensory motor; communication; psychomotor; intellectual-conceptual, integrative and quantitative; and behavioral and social attributes. Please refer to the "Tech-

nical Standards for Admission”, including information on reasonable accommodations, on the school’s website: <http://www.uwyo.edu/nursing/programs/technical-standards-for-admission.html>.

Background Checks Requirement

Students enrolled in clinical training programs within the College of Health Sciences are placed in educational and clinical settings where highly vulnerable clients such as minor children, individuals with disabilities, and/or the elderly, are routinely served. These clinical/practice training sites (including schools, hospitals, pharmacies, and other university sites) routinely require criminal background checks for all students who engage in clinical activities. Therefore, background checks shall be required on all applicants to programs in the College of Health Sciences prior to admission into their prospective program.

Students applying for admission into the nursing major component of the BSN Program, the MS Program, and the DNP Program will be notified by the FWWSO at the time of any admission offer the process for completing the required background check. Previous background checks (e.g. CNA Certification, LPN or RN Licensure) are not acceptable to fulfill this expectation. The results of the background check may determine final admittance to the program.

Students may also be required to update the criminal background check. Each clinical training site will be informed that students have passed a background check prior to placement at that site; some sites may require a more current background check. Clinical agencies may bar a student access to their facility for clinical experiences based on the results of the background check. If faculty and staff are not able to place the student in an alternative setting, the student will not be able to complete the program. In addition, students seeking readmission into the program are required to complete a new background check. Students are responsible for the costs associated with the admission background check and any other background checks that may be required.

Drug Screening Requirements

Drug screening may be required by some clinical training sites. Students will be notified by the FWWSO should this be an expectation of them. Students may incur charges for this screening and will be notified of such at that time. Drug and/or alcohol testing for any student can be requested by the FWWSO.

Bachelor of Science in Nursing (BSN) Program

The Fay W. Whitney School of Nursing provides a curriculum based on the solid foundation of a general studies program. University students are individuals who come with learning preferences, different experiences, varied goals, and therefore, have unique learning needs. The primary responsibility of faculty is to empower students to become self-directed learners. Active learning is a teaching/learning partnership.

Expected Student Learning Outcomes

At completion of the Bachelor of Science in Nursing (BSN) degree, graduates will be able to meet the end of program student learning outcomes:

1. Minimize risk of harm to patients and providers through both system effectiveness and individual performance.
2. Advance nursing practice related to patient care technologies, information systems, and communication devices that support safe nursing practice.
3. Achieve optimal individual, family, group, community, and population outcomes guided by clinical reasoning and appraisal of evidence of best practice.
4. Demonstrate effective leadership through heightened self-awareness to empower others in the attainment of optimal patient outcomes.
5. Use mutually respectful communication, collaboration, and leadership skills within interprofessional teams in the management of care in diverse, complex, global, and dynamic healthcare systems.
6. Participate as a nursing professional in the development and implementation of healthcare policy, finance, and regulatory entities, including local, state, national, and global healthcare trends.
7. Provide patient centered care by reflecting on the uniqueness of an individual patient’s background, personal preferences, culture, values, traditions, and family which promotes optimal health outcomes by involving patients and families as they make clinical care decisions.
8. Demonstrate respectful, efficient, safe, and well-coordinated transitions of the patient through all levels of care.

9. Provide respectful, efficient, safe and well-coordinated patient-centered care to populations by reflecting on beliefs, values, attitudes, and practices.
10. Model professionalism with consistent demonstration of core values evidenced by nurses working with others to achieve optimal health and wellness outcomes in patients, families, and populations by wisely applying principles of altruism, excellence, caring, ethics, respect, communication, professional engagement, lifelong learning, and accountability.
11. Encourage evidence-based health promotion and make a positive contribution to immediate and long-term health status, through the provision of education to individuals, families, groups, communities, and populations that encourages healthy behaviors and choices, prevention of disease, protection from preventable illness and disastrous emergencies.

Bachelor of Science in Nursing (BSN) Program Options

The Fay W. Whitney School of Nursing offers a baccalaureate program with three options to obtain the BSN degree:

1. Basic BSN – a four-year, on-campus BSN option for the student wishing to become a registered nurse at the baccalaureate level.
2. Bachelors Reach for Accelerated Nursing Degree (BRAND) – an accelerated BSN outreach option for the student who has already achieved a previous non-nursing baccalaureate degree and wishes to become a registered nurse at the baccalaureate level.

3. BSN Completion – two online BSN options (ReNEW and RN-BSN) for graduates of an associate degree nursing program who wish to become a baccalaureate prepared nurse.

Please refer to the appropriate program option section that follows below.

Basic BSN

This option is a four-year on-campus BSN program option for students who are interested in becoming a registered nurse.

Second baccalaureate degree seeking students have the choice of pursuing Basic BSN or BRAND (*see information under that heading*).

Admission

Basic BSN has two different admission entries: 1) Freshman Admission to the Nursing major and 2) Non-Freshman Admission to the Nursing major. Criteria for admission as well

as application instructions and deadlines can be found on the nursing website: www.uwyo.edu/nursing (*click on Nursing Programs, BSN, Basic BSN, Freshman Admission or Non-Freshman Admission under Admission to Basic BSN*).

Scholastic Requirements

University and College of Health Sciences policies governing scholastic requirements (e.g. major changes, probation and dismissal) apply to students enrolled in the School of Nursing. In addition to university/college requirements, the School of Nursing has further scholastic requirements for Basic BSN. These requirements can be found on the nursing website: www.uwyo.edu/nursing (*click on Nursing Programs, BSN, Basic BSN, Basic BSN Student Handbook - section 6 Scholastic Requirements*).

Curriculum

The minimum requirement to graduate with a BSN is 120 semester hours of credit. Evaluation of transfer courses is required to determine credit eligibility.

The required courses, ZOO 3115 (Human Systems Physiology), PHCY 3450 [4450] (Pathophysiology), and PHCY 4470 (Pharmacology), must be upper division (3000/4000 level). Lower division/Community College (1000/2000 level) courses do not satisfy this requirement. Transfer courses must be reviewed for acceptability.

Nursing courses are offered fall and spring semesters of the university academic calendar. Students are required to have transportation to all clinical sites. A number of clinical sites are located in Cheyenne. The capstone practicum experience during spring of the senior year requires students to live in locations away from campus.

Program of Study

A detailed, semester sequenced Basic BSN Program of Study can be found on the nursing website: www.uwyo.edu/nursing (*click on Nursing Programs, BSN, Basic BSN, Basic BSN Program of Study*). All required courses identified under Pre-Clinical Component and Clinical Component must be passed with a C or better (or S) except for CHEM 1000, which requires a B or better. In addition, a minimum cumulative NGPA of 3.0 based on all required courses in the program must be maintained.

Applicable for:

Freshman/Non-Freshman Admission to the Nursing Major

Pre-Clinical Component

ENGL 1010: Coll Comp/Rhet.....	3
MATH 1400: College Algebra	3
LIFE 1010: General Biology	4
CHEM 1000: Intro Chemistry or CHEM 1020: Gen Chemistry I	4
FCSC 1141: Principles of Nutrition	3
PSYC 1000: Gen Psychology.....	3
MICR/MOLB 2240: Med Microbiology	4
KIN 2040: Human Anatomy.....	3
KIN 2041: Human Anatomy Lab	1
STAT 2050: Fund in Statistics or STAT 2070: Intro Stat-Soc Sci.....	4
ZOO 3115: Hum Sys Phys	4
First-Year Seminar (FYS) course.....	3
Communication 2 (COM2) course.....	3
Human Culture (H) course (not PSYC 1000).....	3
U.S. & Wyoming Constitutions (V) course.....	3

Clinical Component

NURS 2340: Dev Influences on Hlth	3
NURS 3435: Fund of Prof Nursing	1
NURS 3490: Health Pro in Prf Nsg Prac	4
(Note: Course credit changed from 5 to 4 credits effective spring 2021.)	
NURS 3635: Hlth Assmnt & Clinical Judgmt	3
NURS 3665: Foundations Prof Nsg Roles	3
NURS 3690: Prof Nsg Acute/Chron Illnss	3
NURS 3695: Prof Nsg Acute/Chron Prctcm	4
NURS 3890: Prof Nsg Complex Illnss.....	3
NURS 3891: Prof Nsg Older Adults.....	3
NURS 3892: Prof Nsg Mental Hlth/Illnss.....	3
NURS 3895: Prof Nsg Complex Illnss Prctcm	4
NURS 4125: Evidenced-Based Nurs. (COM3)	3
NURS 4665: Hlthrc Infrmtcs Prof Nsg Prac	3
NURS 4690: Prof Nsg Populations	4
NURS 4691: Prof Nsg Children/Families.....	3
(Note: Course credit will change from 3 to 4 credits effective fall 2022.)	
NURS 4695: Prof Nsg Populations Prctcm.....	4
NURS 4865: Prof Nsg Leadership	3
NURS 4895: Prof Nsg Capstone Prctcm	12
With approval from FWWSON, ARMY 3050 may be applied to this requirement and NURS 4895 taken for 9 credits.	
PHCY 3450: Foundational Pathophysiology.....	4
PHCY 4470: Fund Pharmacology	4
(Note: Course requirements/expectations are subject to change. Maintain contact with FWWSON for current expectations.)	

BRAND

This option is for students who have a previous non-nursing baccalaureate degree, and who are seeking an accelerated option for obtaining the BSN.

Nursing theory and supporting courses are offered using a combination of online courses and hybrid courses with periodic intensive on-campus experiences. Clinical coursework is arranged at a Wyoming healthcare institution. This option is a 'summer to summer' format with a full-time schedule of courses.

Admission

Students who meet university requirements are admitted to the university in the pre-nursing component of BRAND (*declared PNBR major*). The number of students admitted to BRAND is limited, and admission is a competitive process. Applicants meeting minimum requirements are not guaranteed admission.

Criteria for admission to BRAND as well as application instructions and deadlines can be found on the nursing website, www.uwyo.edu/nursing (*click on Nursing Programs, BSN, BRAND, Admission Criteria/Application*).

Scholastic Requirements

University and College of Health Sciences policies governing scholastic requirements (e.g. major changes, probation and dismissal) apply to students enrolled in the School of Nursing. In addition to university/college requirements, the School of Nursing has further scholastic requirements for BRAND. These requirements can be found on the nursing website: www.uwyo.edu/nursing (*click on Nursing Programs, BSN, BRAND, BRAND Student Handbook - section 6, Scholastic Requirements*).

Curriculum

The minimum requirement for the second bachelor's (SB) degree candidate to graduate with a BSN is 50 semester hours of credit. This curriculum option totals 56 credit hours.

The minimum requirement for an SB degree is 30 additional semester hours earned from UW, 12 of which must be in upper division level courses. If prior baccalaureate degree was earned through UW, the 30 credit minimum is in addition to the credits earned for previous degree. Evaluation of transfer courses is required to determine credit eligibility.

The required courses, PHCY 3450 [4450] (Pathophysiology) and PHCY 4470 (Pharmacology), must be upper division (3000/4000

level). Lower division/Community College (1000/2000 level) courses do not satisfy this requirement. Transfer courses must be reviewed for acceptability. PHCY 3450 and PHCY 4470 must be completed within three years **before** the May start date.

Program of Study

A detailed, semester sequenced BRAND Program of Study can be found on the nursing website: www.uwyo.edu/nursing (*click on Nursing Programs, BSN, BRAND, BRAND Program of Study*). All required courses identified under Prerequisite Courses and Nursing Courses must be passed with a C or better (or S).

Prerequisite Courses

KIN 2040: Human Anatomy	3
KIN 2041: Human Anatomy Lab	1
ZOO 3115: Hum Sys Phys	4
MICR/MOLB 2021: Gen Microbiology or MICR/MOLB 2240: Med Microbiology	4
PSYC 1000: Gen Psychology.....	3
FCSC 1141: Principles of Nutrition.....	3
PHCY 3450: Foundational Pathophysiology.....	4
PHCY 4470: Fund Pharmacology	4

Required Graduation Course

U.S. & WY Constitutions (V) course	3
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Nursing Courses

NURS 3710: Nursing Fundamentals and Lab	2
NURS 3730: Intro-Professional Nurs	2
NURS 3750: Assess Promotion	4
NURS 3770: Acute Chronic.....	8
NURS 3771: Acute Chronic Prac	6
NURS 3780: EBP in Nursing	4
NURS 4710: Population Health.....	4
NURS 4735: Vuln Pop and Mental Health..	3
NURS 4736: Care Vulnerable Pop Practicum	2
NURS 4740: NSG Young Family	6
NURS 4741: NSG Young Family Prctm	3
NURS 4775: Nursing Senior Capstone	10
NURS 4785: Nursing Integration.....	2

(Note: Course requirements/expectations are subject to change. Maintain contact with FWWSON for current expectations.)

BSN Completion

This BSN Completion program is a distance delivery program with two options: 1) ReNEW BSN and 2) RN-BSN. The program serves Wyoming associate degree students

and graduate of associate degree or diploma nursing program who wish to become baccalaureate-prepared nurses. The two completion options have distinct Related Coursework and admission criteria. They begin on separate tracks and then share 4000-level nursing courses.

Scholastic Requirements

University and College of Health Sciences policies governing scholastic requirements (e.g. major changes, probation and dismissal) apply to students enrolled in the School of Nursing. In addition to university/college requirements, the School of Nursing has further scholastic requirements for BSN Completion. These requirements can be found on the nursing website: www.uwyo.edu/nursing (*click on Nursing Programs, BSN, BSN Completion, Wyoming's ReNEW or RN-BSN, BSN Completion Student Handbook - section 6, Scholastic Requirements*).

Curriculum

The minimum UW requirement to graduate with a BSN in 120 semester hours of credit. Evaluation of transfer courses is required to determine credit eligibility.

The required courses, PHCY 3450 [4450] and PHCY 4470, must be upper division (3000/4000-level). Lower division/community college (1000/2000-level) courses do not satisfy this requirement. Transfer courses must be reviewed for acceptability.

ReNEW - Revolutionizing Nursing Education in Wyoming

ReNEW is Wyoming's shared BSN nursing curriculum. Students and graduates of Wyoming community college ReNEW nursing programs have a direct path into upper-division coursework in pursuit of a BSN from FWWSON. Entry into the ReNEW option begins at a participating Wyoming community college ADN nursing program.

Admission

Students who apply to UW and meet university requirements are admitted to the university in the pre-nursing component of ReNEW BSN (declared PNRN). Criteria for UW admission can be found on the nursing website: www.uwyo.edu/nursing (*click on Nursing Programs, BSN, BSN Completion, Wyoming's ReNEW*).

ReNEW BSN Program of Study

A detailed Program of Study for ReNEW ADN Entry can be found on the nursing website: www.uwyo.edu/nursing (*click on Nursing Programs, BSN, BSN Completion, Wyoming's ReNEW, Program of Study for ReNEW ADN Entry*). All required courses identified under Related Coursework and Nursing Courses must be passed with a C or better (or S).

Related Coursework

MATH 1400: College Algebra	3
STAT 2050: Fund in Statistics or STAT 2070: Intro Stat-Soc Sci.....	4
FCSC 1141: Principles of Nutrition	3
LIFE 1010: General Biology	4
CHEM 1000: Intro Chemistry or CHEM 1020: Gen Chemistry I	4
MICR/MOLB 2021: Gen Microbiology or MICR/MOLB 2240: Med Microbiology	4
PHCY 3450: Foundational Pathophysiology.....	4
PHCY 4470: Fund Pharmacology	4
Humanities Elective course (not PSYC 1000).....	3

Nursing Courses

NURS 3005: ReNEW Distance Foundations.....	1
NURS 4055: App Evidence in Nursing Pract. (COM3).....	3
NURS 4630: Public/Community Health.....	2
NURS 4635: Community as Client.....	2
NURS 4640: Health Disparities	2
NURS 4645: Population Health	2
NURS 4660: Healthcare Informatics	3
NURS 4830: Leadership in Healthcare Today	2
NURS 4835: Leading Nursing Practice	2
NURS 4840: Healthcare Systems and Policy	2
NURS 4845: Innovation in Nursing Practice	2
NURS 4855: Contemporary Nursing Practice	2

University Studies Program Coursework

U.S. & WY Constitutions (V) course	3
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(Note: Course requirements/expectations are subject to change. Maintain contact with FWWSON for current expectations.)

RN-BSN

The RN-BSN option is for non-ReNEW associate degree or diploma-educated registered nurses. This option is delivered nationwide with no on-campus time required.

Admission

Students who apply to UW and meet university requirements are admitted to the university in the pre-nursing component of RN-BSN (*declared PNBS*). Criteria for admission as well as application instructions can be found on the nursing website: www.uwyo.edu/nursing (*click on Nursing Programs, BSN, BSN Completion, RN-BSN, Admission Criteria/Application*).

RN-BSN Program of Study

A detailed Program of Study for RN-BSN Entry can be found on the nursing website: www.uwyo.edu/nursing (*click on Nursing Programs, BSN, BSN Completion, RN-BSN, Program of Study for RN-BSN Entry*). All required courses identified under Related Coursework and Nursing Courses must be passed with a C or better (or S).

Related Coursework

MATH 1400: College Algebra	3
STAT 2050: Fund in Statistics or STAT 2070: Intro Stat-Soc Sci.....	4
FCSC 1141: Principles of Nutrition.....	3
PSYC 1000: Gen Psychology.....	3
LIFE 1010: General Biology	4
CHEM 1000: Intro Chemistry or CHEM 1020: Gen Chemistry I	4
MICR/MOLB 2021: Gen Microbiology or MICR/MOLB 2240: Med Microbiology	4
PHCY 3450: Foundational Pathophysiology.....	4
PHCY 4470: Fund Pharmacology	4
An approved Human Anatomy course.....	4
An approved Human Physiology course.....	4

Nursing Courses

NURS 3425: Bridging Nursing Paradigms..	3
NURS 4055: App Evidence in Nursing Pract. (COM3).....	3
NURS 4630: Public/Community Health....	2
NURS 4635: Community as Client.....	2
NURS 4640: Health Disparities	2
NURS 4645: Population Health	2
NURS 4660: Healthcare Informatics	3
NURS 4830: Leadership in Healthcare Today	2
NURS 4835: Leading Nursing Practice	2
NURS 4840: Healthcare Systems and Policy	2

NURS 4845: Innovation in Nursing Practice	2
NURS 4855: Contemporary Nursing Practice	2

University Studies Program**Coursework**

First-Year Seminar (FYS) course.....	3
<i>Met with 30+ post high school hours.</i>	
ENGL 1010: Coll Comp/Rhet (COM1).....	3
Communication 2 (COM2) course.....	3
<i>Grades of C or better (or S) are required for COM1 and COM2</i>	
Human Culture (H) course (not PSYC 1000).....	3
U.S. & WY Constitutions (V) course.....	3

Escrow Courses

(Credits are automatically posted to the student's UW transcript during the semester of NURS 4855 enrollment. These credits represent credit for nursing content learned in the associate degree or diploma in nursing program.)

NURS 3665: Foundations Prof Nsg Roles	3
NURS 3890: Prof Nsg Complex Illnss.....	3
NURS 3895: Prof Nsg Complex Illnss Prctcm	4

(Note: Course requirements/expectations are subject to change. Maintain contact with FWWSO for current expectations.)

Graduate Study

The Fay W. Whitney School of Nursing offers two graduate programs leading to: 1) a Master of Science (M.S.) degree and 2) a Doctor of Nursing Practice (D.N.P.) degree.

Master of Science (MS) Degree

The MS program is a part-time, online degree open to registered nurses with a minimum of a baccalaureate degree in nursing from a program nationally accredited by CCNE or NLNAC. The MS program has two concentrations: 1) Nurse Educator (NE) and 2) Nurse Leader (NL).

Expected Student Learning Outcomes

M.S. Graduate are prepared to ensure better care, better health, and lower costs through their knowledge, skills, and abilities to:

1. Lead change for quality care outcomes; implement safe, quality care to diverse patients in a variety of settings and roles;

2. Apply teaching/learning principles to the design, implementation, and evaluation of growth in individuals or groups in a variety of settings;
3. Build and lead interprofessional care teams;
4. Design innovative nursing practices;
5. Translate evidence into practice;
6. Promote a healthy work environment for sustainability of the work force.

Admission

Complete application materials for the MS Program must be received by the University of Wyoming no later than May 1 to be considered for fall admission. (*The entire MS application process is completed online.*) The applicant is responsible to make certain that UW is in receipt of all application materials/fees.

Criteria for admission as well as application instructions can be found on the nursing website: www.uwyo.edu/nursing (*click on Nursing Programs, MS, Admission Criteria/Application*).

All new admits are required to come to campus for a fall orientation. This expectation is applicable for both MS concentrations.

Curriculum

Curricula for MS concentrations are available on the nursing website: www.uwyo.edu/nursing (*click on Nursing Programs, MS*). All MS students, regardless of concentration will take a set of core courses. In addition to the core courses, a group of specialty courses are required for each MS concentration.

Doctor of Nursing Practice (DNP) Program

The DNP program is open to registered nurses with a minimum of a baccalaureate degree in nursing from a program nationally accredited by CCNE or NLNAC. The DNP program has two concentrations: 1) Family Nurse Practitioner (FMY) and 2) Psychiatric Mental Health Nurse Practitioner (PSH).

Expected Student Learning Outcomes

Graduates will:

1. engage in evidence-based practice to optimize health outcomes; and
2. engage in leadership activities to promote excellence in rural health care.

Family Nurse Practitioner (FMY)

The FMY concentration prepares advanced practice nurses to provide primary health care to diverse individuals and their families in a variety of outpatient settings, especially rural settings. Graduates are prepared to diagnose and treat common acute problems, such as infections and injuries, and common chronic illnesses, such as diabetes and hypertension. Graduates work in a variety of settings including independent nurse practitioner practices, physician offices, public health clinics, indigent clinics, emergency rooms, Indian Health Services, correctional facilities, and migrant clinics.

Psychiatric Mental Health Nurse Practitioner (PSH)

The PSH concentration prepares advanced practice nurses to provide a full range of psychiatric care. Graduates are prepared to assess, diagnose, and manage, to include prescribing psychotropic medications, for people with chronic and acute psychiatric disorders. Graduates work in a variety of settings including inpatient and outpatient facilities such as hospitals; community-based or home care centers; local, state, and federal mental health agencies; long-term care facilities; private practices; substance abuse and detoxification programs; emergency psychiatric service centers; primary care offices; correctional facilities, home health agencies; and behavioral health care companies.

Admission

Complete application materials for the DNP Program must be received by the University of Wyoming by the application deadline to be considered for fall admission (*The entire DNP application process is completed online*). The applicant is responsible to make certain that UW is in receipt of all application materials/fees. The number of students admitted is limited. Admission is a competitive process and applicants meeting minimum requirements are not guaranteed admission to the program. Admission to the university does not guarantee admission to the DNP program in the School of Nursing.

Criteria for admission as well as application instructions can be found on the nursing website: www.uwyo.edu/nursing (*click on Nursing Programs, DNP, Admission Criteria & Application*).

All new admits are required to come to campus for a Fall orientation. This expectation is applicable for all DNP options.

Curriculum

Curricula for the FMY and PSH concentrations are available on the nursing website: www.uwyo.edu/nursing (*click on Nursing Programs, DNP*). All DNP students, regardless of concentration will take a set of core courses. In addition to the core courses a group of specialty courses are required for each NP concentration. Students earning the DNP degree will complete a final scholarly project which is integrated into the FMY and PSH curricula.

The DNP core and clinical courses will be delivered using a combination of online courses; synchronous video web-conferencing, and hybrid courses with periodic intensive on-campus experiences. Clinical placements will be arranged at health care facilities in Wyoming, north central Colorado, or southern Montana.

Nursing (NURS)

Courses listed below are open only to students formally admitted into one of the nursing programs (BSN, MS, or DNP) as required of their specific program option or concentration. Exceptions include NURS 1101, 2240, and 3250, which are open to any student.

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1101. First-Year Seminar. 3. [(none)◀▶FYS]

2240. Medical Terminology. 3. Introduces medical terminology. Includes word structure of medical-surgical terms, body parts and organs, body systems and commonly used medical abbreviations.

2340. Developmental Influences on Health. 3. Explores interaction between development and health. Discusses human development of physiological, psychological, cognitive, sociocultural, and spiritual systems across the lifespan. Identifies selected theories associated development over the lifespan and implications for health care. Provides foundation for more in-depth consideration of developmental factors related to health maintenance and human potential. *Prerequisites:* Progression or admission into clinical component of the program and completion or concurrent enrollment with NURS 3435, 3490, and PHCY 3450 or PHCY 4450.

3005. ReNEW Distance Foundations. 1. Prepares learners for ReNEW BSN Completion in a distance delivery format. The course includes concept-based delivery in the UW learning system, APA formatting, writing scholarly papers, and library resources and skills. *Prerequisite:* Enrolled in or graduate of Wyoming ReNEW Nursing Program.

3250. Health Psychology. 3. Provides overview of growing partnership between psychology and health care, including history of psychology in health care; theoretical foundations of health and illness; intervention and research techniques; stress and high risk behaviors (e.g., substance abuse, eating behaviors, AIDS); psychology's contribution to improving outcomes and quality of life in chronic and life-threatening behaviors. Cross listed with PSYC 3250. *Prerequisite:* PSYC 1000 or consent of instructor.

3425. Bridging Nursing Paradigms. 3. This course prepares incoming ADN- or Diploma-educated Registered Nurses for completion of the Fay W. Whitney School of Nursing (FW-WSON) BSN degree. Nursing knowledge, skills, and abilities in selected content areas will be evaluated and augmented in preparation for BSN Completion coursework. *Prerequisite:* Current RN license.

3435. Fundamentals of Professional Nursing Practice. 1. This course introduces the concepts and skills of basic nursing care and nurse/patient safety. The course allows students to gain confidence and competency in the performance of basic clinical skills. *Prerequisites:* Progression or admission to the clinical component of the program and completion or concurrent enrollment with NURS 2340, NURS 3490, and PHCY 3450 or PHCY 4450.

3490. Health Promotion in Professional Nursing Practice. 4. Students will learn and apply concepts of health promotion across the lifespan. Emphasis is on cultural diversity, health risks, behavior change and healthy practices for individuals, families, and populations. Students will incorporate evidence in designing interventions to promote health and prevent illness for self and clients. *Prerequisites:* Progression or admission to the clinical component of the program and completion or concurrent enrollment with NURS 2340, NURS 3435, and PHCY 3450 or PHCY 4450. (*Note: Course credit changed from 5 to 4 credits effective spring 2021.*)

3635. Health Assessment and Clinical Judgement. 3. Students learn to assess the physiological, psychological, sociocultural, spiritual, and developmental dimensions of individuals across the lifespan. Normal variations and potential alterations of health are identified. Clinical judgment and documentation skills are developed. *Prerequisites:* NURS 3490 and completion or concurrent enrollment with NURS 3665, 3690, 3695, and PHCY 4470.

3665. Foundations of Professional Nursing Roles. 3. This course introduces the student to professionalism, leadership, safety, and

patient-centeredness. The concepts emphasized provide the foundation for professional nursing practice. *Prerequisites:* NURS 3490 and completion or concurrent enrollment with NURS 3635, 3690, 3695, and PHCY 4470.

3690. Professional Nursing Acute/Chronic Illness. 3. Students will examine concepts of nursing practice in the care of adults with acute and chronic illness. Emphasis is on utilizing the nursing process to develop clinical judgment. *Prerequisites:* NURS 3490 and completion or concurrent enrollment with NURS 3635, NURS 3665, NURS 3695, NURS 4470.

3695. Professional Nursing Acute/Chronic Illness Practicum. 4. Students provide nursing care using the nursing process in a clinical setting with adult clients experiencing acute and chronic illness. Emphasis is on demonstration of clinical judgement. *Prerequisites:* NURS 3490 and completion or concurrent enrollment with NURS 3635, NURS 3665, NURS 3690, PHCY 4470.

3710. Nursing Fundamentals and Laboratory. 2. Includes concepts of basic care/comfort, technical skills, medical equipment, asepsis, medication administration, nurse/client safety, and client rights. Increased confidence and competency in critical thinking, communication skills, and the performance of motor skills. *Prerequisites:* previous bachelor's degree; admission to the BRAND track; concurrent enrollment in NURS 3750 and NURS 3730.

3730. Introduction to Professional Nursing. 2. Introduces students to the core concepts of professional nursing practice. Nursing process, domains of nursing practice, health policy, evidence-based practice, legal and professional standards will be assimilated into nursing practice from discussion, role playing and case studies. Contemporary nursing issues and situational factors will be examined. *Prerequisites:* previous Bachelor's degree; admitted to the BRAND nursing track.

3750. Health Assessment and Promotion. 4. Using system analysis, students assess the physiological, psychological, spiritual, socio-cultural, developmental variables of individual clients across the life span. Nursing process and evidence-based nursing practice are used to promote/protect health of clients through health promotion, risk reduction, disease prevention of the client/client systems. Process skills and professional roles are integrated. *Prerequisites:* previous bachelor's degree; admitted to BRAND program; concurrent enrollment in NURS 3710.

3770. Nursing Care in Acute and Chronic Illness. 8. Discern critical elements of professional nursing medical-surgical concepts

for adults experiencing acute/chronic health alterations progressing to complex health alterations. Focuses on patient safety principles; quality initiatives; evidence-based nursing; information technology; interprofessional collaboration, communication; health promotion strategies; and critical thinking in the planning of client centered nursing care for the adult. *Prerequisites:* NURS 3710, NURS 3750, NURS 3730, NURS 3780.

3771. Nursing Care in Acute and Chronic Illness Practicum. 6. Application of critical elements of professional nursing practice with adults experiencing acute and chronic health alterations. Focus is on incorporation of patient safety principles; quality initiatives; evidence-based nursing practice; information technology; interprofessional collaboration and communication; health promotion strategies; and critical thinking and clinical reasoning in the provision of nursing care. *Prerequisites:* NURS 3710, NURS 3750, NURS 3730, NURS 3780.

3780. Evidence-Based Practice in Nursing. 4. Prepares nursing students to engage in evidence-based practice in nursing, specifically how to search the literature and databases, ask meaningful clinical questions, find relevant evidence, critically appraise evidence, integrate best evidence with clinical expertise and patient/community values. *Prerequisites:* admission to the BRAND program, concurrent enrollment in NURS 3770.

3890. Professional Nursing Care in Complex Illness. 3. Students will examine concepts of nursing practice in the care of adults with complex illness. Emphasis is on utilizing the nursing process to develop clinical judgment. *Prerequisites:* NURS 3695 and completion or concurrent enrollment with NURS 3891, 3892, 3895, 4125.

3891. Professional Nursing Care of Older Adults. 3. Students will examine concepts of nursing practice in the care of older adults. Emphasis is on utilizing the nursing process to develop clinical judgment. *Prerequisites:* NURS 3695 and completion or concurrent enrollment with NURS 3890, 3892, 3895, 4125.

3892. Professional Nursing Care in Mental Health and Illness. 3. This course explores mental health and illness concepts. Emphasis is on the role of the professional nurse in caring for clients with alterations in mental health. *Prerequisites:* NURS 3695 and completion or concurrent enrollment with NURS 3890, 3891, 3895, 4125.

3895. Professional Nursing Care in Complex Illness Practicum. 4. Students provide patient-centered care using the nursing process in clinical setting with adult and older adult

clients experiencing complex illness and alterations in mental health. Emphasis is on demonstration of clinical judgment. *Prerequisites:* NURS 3695 and completion or concurrent enrollment with NURS 3890, 3892, 3891, 3892, 4125.

3970. Nursing Externship. 3. Allows students to obtain college credit for nursing experience gained in an approved setting. Increases application of nursing theory, knowledge of a health care agency, interpersonal working relationships, technical skills and organization of time in providing nursing care. Offered S/U only. *Prerequisites:* NURS 3840, 3842, 3844, and 3875. (Offered once a year in summer)

4055. Application of Evidence in Nursing Practice. 3. [L◀COM3] Prepares RN students to engage in evidence-based nursing, specifically how to ask meaningful clinical questions, find relevant evidence, critically appraise evidence, and integrate best evidence with clinical expertise and patient/community values. *Prerequisites:* ReNEW Progression or Formal RN-BSN Admission; STAT 2050 or 2070 or equivalent; COM1 and COM2.

4125. Evidence-Based Nursing. 3. [L,W◀COM3] Prepares students to engage in evidence-based nursing, specifically how to ask meaningful clinical questions, find relevant evidence, critically appraise evidence, and integrate best evidence with clinical expertise and patient/community values. *Prerequisites:* WA and WB or COM1 and COM2; STAT 2050 or 2070 or equivalent; admission into the nursing major component of the program.

4630. Public/Community Health. 2. Learners examine public/community health nursing roles and apply the nursing process to community as client. Focuses on improving community health, levels of prevention, and addresses multiple determinants of health. Core functions, essential services, community assessment and planning, emergency preparedness, and analysis of the public healthcare system will be studied. *Prerequisites:* ReNEW Progression or Formal RN-BSN Admission; NURS 3005 or NURS 3425.

4635. Community as Client. 2. Learners will understand relationships among health, disease, and the environment, with emphasis on the role of community health agencies and programs for communities in need of health care support, regionally, nationally, and globally. In this course, an assessment and planning framework guides students in assessing the health of a community. *Prerequisites:* ReNEW ADN Benchmark or Formal RN-BSN Admission; NURS 3005 or NURS 3425.

4640. Health Disparities. 2. Learners will examine population-focused concepts to assess vulnerable and oppressed populations. The magnitude of health disparities both in the United States and globally will be discussed. Focuses on a multi-level and multi-cultural view of population health challenges, alleviating health disparities, and a commitment to health equity. *Prerequisites:* ReNEW Progression or Formal RN-BSN Admission; NURS 3005 or NURS 3425.

4645. Population Health. 2. Focuses on analysis of local, regional, national, and international data that are indicators of population health. Disease outbreaks are analyzed. Learners study development of innovative, collaborative, multi-disciplinary interventions and policies to improve public health. This course provides opportunities for learners to improve population health through application of theory and evidence. *Prerequisites:* ReNEW ADN Benchmark or Formal RN-BSN Admission; NURS 3005 or NURS 3425.

4660. Healthcare Informatics. 3. Students will develop knowledge and skills to utilize and evaluate information technologies to improve patient outcomes across diverse populations. Includes the use of Clinical Information Systems to plan and document the nursing process. Ethical and legal considerations of data management and interdisciplinary use of healthcare informatics are presented. *Prerequisite:* ReNEW Progression or Current RN license.

4665. Healthcare Informatics in Professional Nursing Practice. 3. Utilizing a conceptual framework, students will examine nursing informatics within healthcare systems. Emphasis is placed on examining the role of clinical information systems in improving patient outcomes across practice, education, administrative, research, and interdisciplinary applications. Ethical and legal considerations of data management are examined. *Prerequisites:* NURS 3895 and completion or concurrent enrollment with NURS 4690, 4691, 4695.

4690. Professional Nursing Care of Populations. 4. Introduces the student to population-focused nursing and applies the nursing process to the community as client. Addresses core functions and essential services of public health. Focuses on vulnerable populations; epidemiology; community assessment, planning, and implementation; analysis of the healthcare system; emergency preparedness; and ethical/legal aspects of public health. *Prerequisites:* NURS 3895 and completion or concurrent enrollment with NURS 4665, 4691, 4695.

4691. Professional Nursing Care of Children and Families. 3. This course encompasses the care of women, children, and their families across physiological, psychological, spiritual, developmental, and socio-cultural dimensions. The focus of this class is on women's health, obstetrical, and pediatric nursing care including health promotion and wellness specific to maternal and pediatric health. *Prerequisites:* NURS 3895 and completion or concurrent enrollment with NURS 4665, 4690, 4691, 4695. (*Note: Course credit will change from 3 to 4 credits effective fall 2022.*)

4695. Professional Nursing Care of Populations Practicum. 4. Students will apply the nursing process to childbearing families, children, and communities. The focus is on physiological, psychological, spiritual, developmental, and socio-cultural dimensions of individuals, families, and populations. Students will incorporate professional nursing roles into population-based care. *Prerequisites:* NURS 3895 and completion or concurrent enrollment with NURS 4665, 4690, 4691.

4710. Population Health. 4. Introduces the student to population-focused nursing and applied the nursing process to the community as client. Addresses core functions and essential services of public health. Focuses on vulnerable populations; epidemiology; community assessment, planning and implementation; analysis of the health care system; emergency preparedness; and legal aspects of public health. *Prerequisites:* NURS 3770, 3771; concurrent enrollment in NURS 4740, 4741, 4735, 4736.

4735. Vulnerable Populations and Mental Health. 3. This course introduces students to nursing principles and concepts of mental health psychopathology, physiology, psychology, and spirituality, along with developmental and socio-cultural considerations while incorporating treatment modalities related to the nursing of the middle-aged and aging adult. *Prerequisites:* NURS 3770 and 3780; concurrent enrollment in NURS 4736.

4736. Nursing Care of Vulnerable Populations Practicum. 2. Applies past learning and cultivates evidence-based nursing practice for vulnerable populations in acute/ community settings. Focuses on the vulnerability associated with mental health, psychiatric illnesses. Core public health functions of community assessment, essential health services, disaster preparedness, health policy development/global health care are also emphasized to implement population-based nursing inter-

ventions. *Prerequisites:* Successful completion of NURS 3770 and NURS 3771; concurrent enrollment in NURS 4710 and NURS 4735.

4740. Nursing Care of the Young Family. 6. Utilizes nursing process to assess, promote, and protect the health of young families as client. Focus is human sexuality and reproduction, family planning, pregnancy stages, neonatal, pediatrics. Growth and development, health promotion, disease prevention, family dynamics are included. Evidence-based nursing guides practice to promote a healthy family and family system. *Prerequisites:* NURS 3770; 3771, and concurrent enrollment in NURS 4741.

4741. Nursing Care of the Young Family Practicum. 3. Applies and synthesizes nursing process to assess, promote, and protect the health of young families as clients. Focus is human sexuality and reproduction, family planning, pregnancy stages, neonatal, pediatrics. Growth and development, health promotion, disease prevention, family dynamics are included. Evidence-based nursing guides practice to promote a health family/family system. Offered S/U only. *Prerequisites:* NURS 3770 and 3780; and concurrent enrollment in NURS 4740.

4750. Independent Study in Nursing. 1-4 (Max. 6). Provides students with opportunity to investigate a problem in nursing care not considered in required nursing courses or to explore in more depth an area considered in one of required nursing courses. Area of study and requirements for earning credit are determined in consultation with nursing faculty member. *Prerequisite:* senior standing in nursing or consent of instructor. Offered S/U only. (Normally offered fall, spring and summer)

4775. Nursing Senior Capstone. 10. Provides opportunities to utilize and synthesize core concepts of professional nursing. Intensive clinical experience allowing students to become socialized into health care delivery system; gain in autonomy/confidence in performing skills; practice critical thinking and clinical reasoning in making ethical clinical decisions; develop leadership in providing and coordinating evidence-based nursing care. Offered S/U only. *Prerequisites:* NURS 4710; NURS 4735; NURS 4736; and concurrent enrollment in NURS 4785.

4785. Nursing Integration. 2. Focuses on the continuing integration of previously learned concepts. The student further develops the role of consumer of research and incorporates leadership and management skills as a member

of the profession. *Prerequisites:* NURS 4735; NURS 4736; NURS 4710; and concurrent enrollment in NURS 4775.

4790. Special Topics in Nursing. 1-3 (Max. 8). Provides offerings in selected nursing topics on concepts, theories or practices as related to specified areas in nursing. *Prerequisites:* junior standing in nursing and consent of instructor.

4792. Cultural and International Health Care Immersion. 3. An in-depth examination of cultural influences on health care systems, which will include both classroom and in-field immersion experiences. *Prerequisites:* senior or graduate standing in student's major and instructor permission.

4830. Leadership in Healthcare Today. 2. Focuses on the role of nurse leader and manager through integration of leadership, management, and organizational concepts, models, and theories. Emphasis in on leadership, followership, management, advocacy, professional development and activism, and managing resources. *Prerequisite:* ReNEW Progression or Formal RN-BSN Admission; NURS 3005 or NURS 3425.

4835. Leading Nursing Practice. 2. Focuses on nurse leaders making a difference using evidence-based nursing practice. Learners utilize and synthesize basic concepts of professional nursing practice. This course creates the opportunity for learners to lead nursing practice in a variety of settings. *Prerequisites:* ReNEW ADN Benchmark or Formal RN-BSN Admission; NURS 3005 or NURS 3425.

4840. Healthcare Systems and Policy. 2. Learners examine healthcare quality and the regulation of professional nursing practice in various settings. The focus is on ethical and legal issues and policy development for healthcare delivery. *Prerequisites:* ReNEW Progression or Formal RN-BSN Admission; NURS 3005 or NURS 3425.

4845. Innovation in Nursing Practice. 2. Focus in on use and synthesis of concepts in professional nursing practice. This course provides an opportunity to employ critical thinking, to apply ethical decision-making, to use evidence, and to demonstrate the ability to lead planned change. *Prerequisites:* ReNEW ADN Benchmark or Formal RN-BSN Admission; NURS 3005 or NURS 3425.

4855. Contemporary Nursing Practice. 2. Focus in on practice as critically effective members and leaders of the healthcare team. Learners analyze a variety of societal, economic, political, and professional issues that influence contemporary nursing. This course provides an opportunity to be creative in examining trends in nursing and healthcare.

Prerequisites: ReNEW ADN Benchmark or Formal RN-BSN Admission; NURS 3005 or NURS 3425.

4865. Professional Nursing Leadership. 3. The role of the nurse leader in nursing practice is developed through integration of leadership, management, and organizational theories. Emphasis is on interprofessional care management, planned change, advocacy, activism, and professional development. *Prerequisites:* NURS 4695 and completion or concurrent enrollment with NURS 4895.

4895. Professional Nursing Capstone Practicum. 12. Students utilize and synthesize basic concepts of professional nursing practice. The course socializes students into a healthcare system. Learning experiences allow students to gain confidence in managing patient care, practicing critical thinking, developing leadership and advocacy skills, and exploring ethical decision-making in clinical situations. *Prerequisites:* NURS 4695 and completion or concurrent enrollment with NURS 4865.

5140. Pharmacotherapy for Primary Care Practitioners. 4. Prepares primary care practitioners in drug therapy management for a variety of client populations with an emphasis on rural practice. *Prerequisite:* admission into NP program; NURS 5165; or consent of NP program coordinator.

5165. Advanced Pathophysiology for Primary Care Practitioners I. 2. A system-based approach is used to explore selected pathophysiological states encountered across the lifespan in primary care. The developmental physiology, etiology, pathogenesis, clinical manifestations, and physiological responses to illness and treatment regimens are examined, providing a basis for the foundation of clinical decisions. *Prerequisites:* Admission in the Doctor of Nursing Practice program.

5166. Advanced Pathophysiology for Primary Care Practitioners II. 3. A system-based approach is used to explore selected pathophysiological states encountered across the lifespan in primary care. The developmental physiology, etiology, pathogenesis, clinical manifestations, and physiological responses to illness and treatment regimens are examined, providing a basis for the foundation of clinical decisions. *Prerequisites:* NURS 5165, NURS 5800, NURS 5805, NURS 5810 and NURS 5865.

5405. Theoretical Foundations in Nursing: Exploring Learning and Leadership. 3. Emphasizes the learning and leadership potential of constructivist and developmental approaches, including transformative learning and complementing theories as a foundations

for education and leadership practice. *Prerequisite:* Admitted to UW's MS Nursing Program; Co-requisite: NURS 5410.

5410. Becoming a Leader. 3. Emphasis on strategic use of self as a foundation for professional leadership development. *Prerequisite:* Admitted to UW's MS Nursing Program; Co-requisite: NURS 5405.

5415. Evidence-Informed Decision-Making. 3. Emphasis on use of a guiding framework to conduct a methodical process for evidence-informed decision making. *Prerequisites:* Admission to UW's MS Nursing Program; NURS 5405; NURS 5410.

5420. Leadership Within Health Care Systems. 3. Emphasis on strategic use of systems and outcomes as a foundation for professional leadership development. *Prerequisites:* Admission to UW's MS Nursing Program; NURS 5405; NURS 5410.

5424. Rural and Global Population Health and Policy. 3. Emphasis on population health, epidemiology, and health policy related to rural and global health. *Prerequisites:* Admission to the nursing MS program; NURS 5405; NURS 5410.

5425. Health Policy for Rural and Global Population Health. 3. Emphasis on health policy as it influences rural and global population health. *Prerequisites:* NURS 5415; NURS 5420; NURS 5430.

5430. Population Health. 3. Emphasis on epidemiology and population health. *Prerequisites:* NURS 5415; NURS 5420; NURS 5425.

5435. Educational Leadership. 3. Emphasis on learning frameworks of leadership development. *Prerequisites:* NURS 5425; NURS 5430.

5440. Science of Quality Improvement and Safety. 3. Emphasis on theoretical and scientific foundations for quality improvements and safety in health education. *Prerequisites:* Admission to the UW's NS Nursing Program, NURS 5405, NURS 5410 OR NURS 5140.

5451. Advanced Leadership Strategies. 3. Emphasis on optimization of leadership. *Prerequisites:* Admission to UW's MS Nursing Program; NURS 5405; NURS 5410; NURS 5420.

5452. Curriculum Development. 3. Emphasis on the process of developing curricula in nursing educational or healthcare setting to include evaluation of program outcomes. *Prerequisites:* Admission to UW's MS Nursing Program; NURS 5405; NURS 5410; Co-requisite of NURS 5462.

5461. Business of Healthcare. 3. Emphasis on leading and managing entrepreneurial healthcare opportunities. *Prerequisites:* Admission to MS; NURS 5405; NURS 5410.

5462. Teaching Methodologies and Evaluation. 3. Emphasis on evidence-based teaching methodologies, development of course materials, and evaluation of students learning outcomes. *Prerequisites:* Admission to MS; NURS 5405; NURS 5410.

5472. Integrated Advanced Pathophysiology, Pharmacology, and Assessment. 3. Emphasis on integration of advanced pathophysiology, and assessment in relation to chronic conditions. *Prerequisites:* Admission to UW's MS Nursing Program; NURS 5405; NURS 5410.

5473. Advancing Healthcare Transformation through Academic-Practice Partnerships. 3. Emphasis on academic/practice partnerships as avenues for addressing population health and related workforce development. *Prerequisites:* Admission to the NURS MS program, NURS 5405, NURS 5410.

5483. Practicum: Rural Healthcare Leadership. 3. Emphasis on the integration of learning through a practicum experience in educational or healthcare leadership. *Prerequisites:* Completion of all required MS courses, corequisite NURS 5473.

5750. Independent Advanced Study. 1-4 (Max. 8). Provides students the opportunity to analyze a problem in nursing; apply theory to clients in a clinical setting; or pursue an area of interest under the guidance of a faculty member. Requirements and evaluation are mutually established between the student and faculty member. Offered as satisfactory/unsatisfactory only.

5790. Advanced Issues in Health. 1-3 (Max. 12). Designed to provide graduate students the opportunity of pursuing advanced issues in health. *Prerequisite:* graduate status.

5800. Foundations of Integrative Advanced Practice Nursing. 3. An introduction to the core concepts and roles of advanced practice nursing, particularly the doctoral-prepared nurse practitioner. Special emphasis is given to 1) the integration of nursing and other health-related theories and models in rural nurse practitioner-delivered care and 2) professional writing in advanced practice nursing. *Prerequisite:* admission to the DNP program.

5805. Evidence-based Practice for Advanced Practice Nursing I. 3. Overview of the evidence-based practice model, including the contributions of research, patient preferences, and clinician expertise, and the theoretical frameworks that inform this expertise. Evaluating typical research designs for advanced practice nursing. *Prerequisite:* admission to the DNP program.

5810. Health Behavior Change I: Foundations. 3. This course will cover foundations of health behavior change including theories/models, techniques, as well as the application to advanced nursing practice. Topics include examination of individual, contextual, and cultural factors. Topics function as skill building for advanced Health Behavior Change (HBC) courses. *Prerequisite:* admission to the DNP program.

5815. Evidence-based Practice for Advanced Practice Nursing II. 3. Students learn to develop an evaluation of clinical practice based upon critical appraisal of the existing research evidence, clinician expertise, and patient preferences. Special emphasis is placed on methods that an advanced practice nurse might use to generate and disseminate evidence from clinical practice. *Prerequisite:* NURS 5165, NURS 5800, NURS 5805, NURS 5810 and NURS 5865.

5820. Health Behavior Change II: Primary Prevention and Wellness. 3. This course will cover the application of theories and techniques of health behavior change and principles of epidemiology to health issues from the individual to the community level. Topics include population health and health disparities in the context of health behavior change as well as development of health improvement programs in advanced nursing practice, including needs assessments, intervention development, and evaluation. Topics also include understanding lifestyle and behavior change interventions. *Prerequisites:* NURS 5165, NURS 5800, NURS 5805, NURS 5810 and NURS 5865.

5824. Advanced Health Assessment and Clinical Decision-Making for Nurse Practitioners. 2. Builds upon basic nursing assessment skills; includes a human cadaver lab experience to enhance learners' understanding of anatomy, physiology, and pathophysiology, progressing to didactic, hands-on practice, and check-offs of student ability to perform client interviewing and advanced physical assessment techniques. Prepares learners for the clinical decision-making required of nurse practitioners. *Prerequisite:* Admission in the Doctor of Nursing Practice (DNP) program and successful progression in the DNP program of study.

5825. Advanced Health Assessment and Clinical Decision-Making for Family Nurse Practitioners. 4. Advanced health assessment and diagnostic decision-making for family nurse practitioners. Builds on previous assessment skills and covers specialty exams used in primary care. Emphasizes a systematic diagnostic reasoning approach that leads to ac-

curate clinical decision-making. Additionally, course focuses on sociocultural influences, growth and development, and gender concepts. *Prerequisite:* NURS 5166, NURS 5815, NURS 5820, and NURS 5824.

5830. Health Behavior Change III: Secondary and Tertiary Prevention. 3. This course will cover the application of health behavior change skills in advanced nursing practice with a focus on chronic illness. Topics include the development of skills for understanding adherence and self-management, supporting client/patient self-management goals, and creating education/treatment plans. Topics also include the use of general and specific health behavior change techniques for integration into advanced nursing practice. Students will participate in on-campus intensive practice of behavior change skills with standardized patient actors. *Prerequisites:* NURS 5140.

5840. Leadership in Advanced Practice Nursing. 3. Organizational and systems leadership for improvement of health. Focuses on interrelationship among systems, ethics, policy, and change. Identifies qualities and behaviors associated with exemplary nursing leadership. Special emphasis is given to rural health care systems. *Prerequisite:* NURS 5440, NURS 5830 AND NURS 5880, NURS 5881 OR NURS 5871, NURS 5872.

5845. Health Communication/Informatics. 3. Emphasizes understanding, managing and using of information systems/technology to provide healthcare in rural health settings. Discussion includes the evaluation and project management of the human/technology interface with specific attention to business, ethical and legal issues encountered in interdisciplinary, collaborative settings. *Prerequisite:* NURS 5440, NURS 5830 AND NURS 5880, NURS 5881 OR NURS 5871, NURS 5872.

5850. Innovative Practice Models. 4. Examination of innovative health care models and their incorporation into primary care. Emphasizes the evaluation models in care delivery, quality management, and business improvement strategies. *Prerequisite:* NURS 5840, NURS 5845 AND NURS 5873, NURS 5874 OR NURS 5861, NURS 5882.

5861. Practicum: Therapeutic Interventions Across the Lifespan. 3. Clinical practicum focused on beginning level therapeutic competencies in the advanced practice role of the PMHNP. *Prerequisites:* NURS 5440, NURS 5830, NURS 5880 and NURS 5881.

5862. Practicum: Diagnosis and Management of the Psychiatric Client for the PMHNP I. 5. Clinical practicum focused

on beginning level diagnostic and clinical management competencies for the PMHNP. *Prerequisite:* NURS 5850.

5863. Practicum: Diagnosis and Management of the Psychiatric Client for the PMHNP II. 5. Clinical practicum that allows students to continue to practice and refine competencies in the PMHNP role with multiple and complex psychiatric populations. *Prerequisite:* NURS 5862, NURS 5883 and NURS 5891.

5865. Doctor of Nursing, Practice Seminar. 1 (Max. 6). Instructor and student-led discussions designed to facilitate role transition of the doctorally-prepared nurse practitioner. Seminars include topics related to integration and application of nursing and other health-related theories and models in rural nurse practitioner-delivered care. Topics will vary by year and semester as students' progress through the DNP program. *Prerequisites:* admission to the DNP program and progression through DNP plan of study.

5871. Wellness for Adults in Primary Care. 3. Provision of wellness primary care for adults across the lifespan, including primary and secondary prevention. *Prerequisite:* NURS 5140 and NURS 5825.

5872. Practicum for Wellness in Primary Care. 3. Clinical practicum for NURS 5871, Wellness for Adults in Primary Care. *Prerequisite:* NURS 5140 and NURS 5825.

5873. Primary Care for Children, Adolescents, and Families. 3. Provision of primary care for children, adolescents, and families across the lifespan, including primary and secondary prevention. *Prerequisite:* NURS 5440, NURS 5830, NURS 5871 and NURS 5872.

5874. Practicum for Primary Care for Children, Adolescents, and Families. 3. Clinical practicum for NURS 5873, Primary Care for Children, Adolescents, and Families. *Prerequisite:* NURS 5440, NURS 5830, NURS 5871 and NURS 5872.

5875. Primary Care for Acute & Chronically Ill Adults. 3. Diagnosis and management of select acute and chronic illnesses experienced by adults across the lifespan. Primary focus is on those physical and behavioral illnesses with high prevalence in rural primary care. *Prerequisite:* NURS 5850.

5876. Practicum for Primary Care for Acute & Chronically Ill Adults. 3. Clinical practicum for NURS 5875, Primary Care for Acute & Chronically Ill Adults I. *Prerequisite:* NURS 5850.

5877. Primary Care for Acute & Chronically Ill Adults II. 3. Continuation of NURS 5875. Diagnosis and management of select acute and chronic illnesses experienced by adults across the lifespan. Primary focus is on those physical and behavioral illnesses with high prevalence in rural primary care. *Prerequisite:* NURS 5875, NURS 5876 and NURS 5891.

5878. Practicum for Primary Care for Acute & Chronically Ill Adults II. 3. Clinical practicum for NURS 5877, Primary Care for Acute & Chronically Ill Adults II. *Prerequisite:* NURS 5875, NURS 5876 and NURS 5891.

5880. Neurobiology & Psychopharm. 3. The advanced study of neurobiology and psychopharmacology in the treatment of psychiatric disorders across the lifespan. In depth exploration of how the advanced practice psychiatric nurse can utilize pharmacodynamics and pharmacogenetics to inform the clinical decision making in the treatment complex mental illnesses and addiction. *Prerequisites:* NURS 5140.

5881. Psychotherapy Models and Theories for Advanced Practice Mental Health Nursing. 3. Utilization of psychotherapy frameworks in the care of individuals, families, and groups. Emphasizing the counseling role and skill development of the advanced practice mental health nurse in the assessment, intervention and evaluation of diverse populations across the lifespan. Issues of ethics, rural practice, and diversity are addressed throughout the course. *Prerequisites:* NURS 5140.

5882. Advanced Psychiatric Mental Health Nursing Diagnosis and Management for the Adult, Older Adult, and Vulnerable Populations. 4. Advanced knowledge of evidence based assessment, diagnosis, treatment, management, and health promotion of adults and aging adults with mental illness. Explore culturally sensitive care among vulnerable populations. Examine the professional, ethical, policy, and practice issues influencing the role of the advanced practice psychiatric nurse. *Prerequisites:* NURS 5440, NURS 5830, NURS 5880 and NURS 5881.

5883. Advanced Psychiatric Mental Health Nursing Diagnosis and Management for the Child and Adolescent. 4. Evidenced based assessment, diagnosis, treatment and management of mental health disorders in children and adolescence at the individual, family and community level. Theories of family development including behavioral patterns will be assessed using a culturally sensitive lens. Review of psychotherapy, psychopharmacol-

ogy, psychoeducation, and health promotion as is developmentally appropriate. *Prerequisite:* NURS 5850.

5891. DNP Project I. 3. In collaboration with a facility, learners will examine clinically relevant data to target a practice and/or patient outcome for improvement. Learners will collect and critically appraise related evidence and develop an intervention, including an outcome evaluation plan. *Prerequisite:* NURS 5850.

5892. DNP Project II. 3. Continuation of NURS 5891, DNP Project I. In collaboration with facility, learners will implement the proposed clinical intervention, evaluate the outcome, and professionally disseminate the results. *Prerequisite:* NURS 5891 AND NURS 5875, NURS 5876 OR NURS 5862, NURS 5883.

5895. Final DNP Practicum. 5-6 (Max. 6). This final clinical experience provides learners with the opportunity to integrate previous learning from the DNP program in the provision of evidence-based health care. *Prerequisite:* Admission to DNP program.

5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5960. Thesis Research. 1-12 (Max. 24). Graduate level course designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrolled in a graduate degree program.

School of Pharmacy

292 Health Sciences, (307) 766-6120

FAX: (307) 766-2953

Web site: www.uwyo.edu/Pharmacy

Dean: Kem Krueger

Associate Dean of Students: Tonja Woods

Professor:

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Associate Professors:

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JARED S. BUSHMAN, B.A. University of Utah 2003; M.S. University of Rochester 2006; Ph.D. 2008; Associate Professor of Pharmaceutical Science 2020.

E. KURT DOLENCE, B.S. University of Wyoming 1983; Ph.D. University of Kentucky 1987; Associate Professor of Medicinal Chemistry 2005, 1999.

GUANGLONG HE, B.S. Anhui Normal University 1986; M.S. Chinese Academy of Sciences 1994; Ph.D. 1997; Associate Professor of Medicinal Chemistry 2019, 2013.

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TRACY D. MAHVAN, B.S. University of Colorado 1995; Pharm.D. 1998; Associate Professor of Pharmacy Practice 2006, 2000.

RESHMI L. SINGH, B.S. Bombay University 1999; M.S. University of Toledo 2001; Ph.D. University of Minnesota 2005; Associate Professor of Social and Administrative Pharmacy 2019, 2013.

BASKARAN THYAGARAJAN, B.S. Madras Medical College 1994; M.S. Banaras Hindu University 1996; Ph.D. Karl Franzens University 2001; Associate Professor of Pharmaceutics 2017.

Assistant Professors:

MICHELLE BLAKELY, B.A. University of South Alabama 2005; M.Ed. Auburn University 2008; Ph.D. 2011; Assistant Professor of Social and Administrative Pharmacy 2018.

KAREN MRUK, B.A. Drew University 2003; Ph.D. University of Massachusetts Medical School 2012; Assistant Professor of Pharmaceutical Science 2018.

Clinical Professor:

MICHELLE L. HILAIRE, Pharm.D. Duquesne University 2002; Clinical Professor of Pharmacy Practice 2016, 2010, 2004.

JAMIE R. HORNECKER, B.S. Texas Tech University 1999; Pharm.D. University of Wyoming 2003; Clinical Professor of Pharmacy Practice 2012, 2005.

Clinical Associate Professors:

LAUREN BIEHLE, Pharm.D. University of Georgia 2010; Clinical Associate Professor 2020.

BECKY S. LINN, B.A. University of Wyoming 1997; Pharm.D. 2002; Clinical Associate Professor 2020.

JANELLE L. KRUEGER, B.S. University of Wyoming 1992; M.S. University of Kansas 1997; Clinical Associate Professor of Pharmacy Practice 2013, 2005.

ALLISON M. MANN, B.S. University of Colorado Boulder 2004; Pharm.D. University of Colorado Denver 2009; Clinical Associate Professor of Pharmacy Practice 2020.

LEENA D. MYRAN, B.S. University of Wyoming 2000; Pharm.D. 2012; Clinical Associate Professor of Pharmacy Practice 2020.

JEREMY VANDIVER, B.A. University of Colorado 2006; Pharm.D. University of Colorado 2010; Clinical Associate Professor 2020.

TONJA M. WOODS, Pharm.D. University of Wyoming 2002; Clinical Associate Professor of Pharmacy Practice 2009, 2003.

Clinical Assistant Professors:

JED DOXTATER, B.S. University of Montana 2006; M.S. University of North Dakota 2013; Clinical Assistant Professor 2015.

THANH-NGANG NGUYEN, B.S. University of California Santa Barbara 2002; Pharm.D. University of Wyoming 2012; Clinical Assistant Professor 2014.

ALIVN OUNG, Pharm.D. MCPHS University 2014; Clinical Assistant Professor 2016.

JESSICA PAPKE, Pharm.D. University of Wyoming 2017; Clinical Assistant Professor 2020.

Associate Lecturers:

ANTOINETTE K. BROWN, B.S. University of Wyoming 1992; Assistant Lecturer 2013.

DAVID C. BRUCH, B.S. University of Wyoming 1998; Pharm.D. 2010; Assistant Lecturer 2012.

Drug Information Director:

MELISSA L. HUNTER, B.S. University of Wyoming 2000; Pharm.D. 2004; Associate Research Scientist 2013, 2007.

Professors Emeriti:

Emery Brunett, Ph.D.
Bruce W. Culver, Ph.D.
Linda Gore Martin, Pharm.D.
Kenneth F. Nelson, Ph.D.
Robert B. Nelson, Ph.D.
Robert D. Scalley, Pharm.D.
Beverly, Sullivan, Pharm.D.
M. Glauca Teixeira, Ph.D.
Weeranuj Yamreudeewong, Pharm.D.

Deans Emeriti:

John H. Vandel, B.S. Pharmacy
Linda Gore Martin, Pharm.D.

Vision, Mission and Values

Vision

The University of Wyoming School of Pharmacy will be nationally recognized for innovative research, teaching and pharmacy practice that develops scholar-practitioners and substantively enhances the health and well-being of the communities we serve.

Mission

The University of Wyoming School of Pharmacy exists to advance the educational and professional development of our students, generate and translate scientific findings into meaningful innovations in healthcare, and positively impact the health and well-being of the communities we serve. We accomplish this through:

- Innovative, collaborative and interdisciplinary programs that integrate research, teaching and pharmacy practice
- The development of scholar-practitioners capable of ethically leading and embracing change and substantively enhancing health outcomes
- Individualized, faculty-led student educational experiences

As a result, we will attract, recognize and retain the very best students, faculty and staff to drive the success of the School.

Statement of Values

The UW School of Pharmacy community is committed to supporting and promoting individual and collective excellence in teaching, research, service and pharmacy practice. We value responsibility, compassion, respect, and integrity in all endeavors.

Learning Outcomes

The University of Wyoming adheres to the American Association of Colleges of Pharmacy Center for Advancement of Pharmaceutical Education (CAPE) educational outcomes 2013. This multipage document (and its supplements) can be accessed at www.aacp.org. The school has outlined student/curriculum learning outcomes; these are available on the school website.

Student/Faculty Relations

The faculty and staff at the School of Pharmacy treat students as adults and expect appropriate behavior as beginning professionals. The School of Pharmacy recognizes that the profession of pharmacy demands of its members

the utmost degree of professional competence, ethical behavior, and integrity. Upon enrolling at the University of Wyoming SOP and at the start of each academic year, all students will sign a pledge acknowledging that they have received and read the current Honor Code and that they have made a personal commitment to uphold the code and abide by its principles. Similarly, the School of Pharmacy Code of Professional Expectations for faculty and staff is built on the foundation of respect for others, personal responsibility, the creation and maintenance of trust, and honesty and truthfulness. The administration, faculty, staff, students, and alumni of the School of Pharmacy at the University of Wyoming should strive to set an example of ethical leadership and professional behavior as those traits are essential for good social and business interactions.

Accreditation and Membership

In Wyoming, as in most other states, one requirement for examination and registration as a pharmacist is graduation from an accredited entry-level professional program at a school or college of pharmacy. The Accreditation Council for Pharmacy Education (ACPE), the national accrediting agency for pharmacy, accredits pharmacy degree programs.

The Doctor of Pharmacy program at UW was most recently accredited in 2012 following an on-site evaluation by the ACPE in October 2012. Verification of current accreditation status may be made by: a) contacting the Dean's Office, School of Pharmacy; b) connecting to www.uwyo.edu/pharmacy/; c) contacting the Accreditation Council for Pharmacy Education (190 South LaSalle Street, suite 2850 Chicago IL 60603, (312) 664-3575; cinfo@acpe-accredit.org) or d) by checking the latest Annual Directory of Accredited Professional Programs published by ACPE.

The school is a member of the American Association of Colleges of Pharmacy and adheres to its educational standards.

Preprofessional Program and Requirements

Applicants for the professional program in pharmacy must complete preprofessional requirements before they can be admitted. Usually, two academic years totaling 72 credit hours (which may include summer and J-Term semesters) is required to complete preprofessional requirements.

All preprofessional coursework must be completed by the end of the spring semester prior to matriculation in the professional program.

Graduates of fully accredited high schools may be admitted to the preprofessional program with a math placement score of 3 or an ACT math score of 23.

Preprofessional Program (PPCY) Required Curriculum

CHEM 1020 General Chemistry
 CHEM 1030 General Chemistry II
 LIFE 1010 General Biology
 LIFE 2022 General Biology II
 MATH 2200 Calculus I
 STAT 2050 Fundamentals of Statistics
 CHEM 2420 Organic Chemistry I
 CHEM 2440 Organic Chemistry II
 KIN 2040 Human Anatomy
 KIN 2041 Human Anatomy Laboratory
 MOLB 2021 General Microbiology
 MOLB 3610 Principles of Biochemistry
 ZOO 3115 Human Systems Physiology
 General Electives (6 credits total)

USP Requirement

Students entering the university in the preprofessional program must fulfill University Studies Program (USP) requirements. The School of Pharmacy is committed to ensuring graduates are educated individuals with a broad general education as well as professional knowledge and skills. This general education component is achieved by completion of the University Studies Program requirement. The USP-C3 requirement is fulfilled in the professional doctoral program. Each student, both professional and preprofessional, is assigned an adviser to assist him or her in making appropriate academic choices.

Professional Doctoral Program Admission

Admission to the professional program leading to the entry-level Pharm. D. degree is limited to 52 students per year and is highly competitive. Admission is granted by the School of Pharmacy Dean upon the advice of the School of Pharmacy Admissions Committee. Students can apply to the professional program as freshman via the Pharmacy Early Decision program. All students applying to the UW School of Pharmacy must use the PharmCAS application (www.pharmacas.org) process. All materials (PCAT scores, and Letters of Recommendation) are submitted to UW using this service. The School of Pharmacy requires no supplemental application. Students granted admission to the professional program will have to pay a one-time, non-refundable, seat fee to guarantee their placement into the entering class. In addition students will be required

to complete any immunizations necessary for experiential rotations. As part of a College of Health Sciences requirement students are also expected to complete and pass a background check prior to final admission to the professional program.

Students must meet, with or without accommodation, specified requirements. The School of Pharmacy's Technical Standards can be found at http://www.uwyo.edu/pharmacy/_files/documents/admin/uwsopt-technical-stds-3-2013.pdf.

The School of Pharmacy provides opportunities to ensure that our students have co-curricular experiences in both our didactic and experiential program. Providing options for students that are co-curricular allows students to choose activities that interest them and will allow them to grow as future health professionals. A portion of co-curricular activities throughout the degree program will be required and assessed.

Students at the University of Wyoming SOP are immersed in interprofessional education opportunities during all years of the professional program. Interprofessional education provides experiences for Pharm.D. students to collaborate and share knowledge with learners in other health sciences disciplines, which fosters readiness for working in team-based care environments in their future careers.

Program of Study Requirements for Graduation

The degree of Doctor of Pharmacy (Pharm.D.) is granted upon satisfactory completion of 146 hours in the professional curriculum in accordance to the school's academic standards and the fulfillment of the general university requirements. Transfer students who have previous professional pharmacy credits accepted as partial completion of residence work may not earn a degree from this university for less than 30 semester hours of resident credit in the professional program of this School of Pharmacy over a minimum of two resident semesters.

Graduation with Honors

The University of Wyoming School of Pharmacy is authorized to grant honors for academic excellence. A Doctor of Pharmacy with honors designation is awarded by the University of Wyoming to students who graduate with exceptional scholarship in Pharmacy.

Exceptional scholarship in pharmacy is defined as a student who is on track to graduate with their class from the University of Wyoming

School of Pharmacy and is in the top 5% of their class based on their pharmacy GPA (as assessed at the end of the fall semester of the P4 year). The Pharmacy GPA is calculated on the basis of required professional pharmacy curriculum coursework and excludes required or selected elective hours. The honors distinction must be approved by a School of Pharmacy faculty vote.

Academic Honesty and Professional Conduct

Students admitted to the professional program are required to participate and sign the University of Wyoming School of Pharmacy Honor Code. Failure to sign the honor code will result in a withdrawal of admission offer or termination from the professional program.

Academic Standards for Progression and Graduation

The course of study in the School of Pharmacy (SOP) is four academic years leading to a Doctor of Pharmacy degree (PharmD). The required professional coursework is organized in a prescribed, non-negotiable, sequential manner. All students have a P-designation identifying their year in the program (P1, P2, P3, P4). Required professional courses (PHCY courses) from any national or international pharmacy programs will not be applied to the UW PharmD degree. The student may petition that coursework to be applied to the program but must replace those credit hours with additional elective courses. Courses taken as S/U, including electives, are usually considered unacceptable in fulfilling program requirements. Auditing PHCY courses by students enrolled in the Doctor of Pharmacy program is also not allowed.

The academic standards herein described are expected to be followed by all students admitted to the professional program. Any violation will constitute grounds for probation or termination from the professional program and will delay progression towards advanced coursework. Probation is a period of time in which the student is allowed to continue in the program under supervision. Students that do not meet academic standards and are placed on probation will have to submit a petition that includes an individualized plan of study for the next semester. This plan must be developed by the student in agreement with and signed by the academic advisor. The petition will be reviewed by the Student Affairs Committee (SAC), which will send a recommendation to the Dean for approval or denial. A leave of absence may be necessary in cases where poor academic perfor-

mance is due to a medical or personal hardship. A leave of absence may be necessary in cases of medical or personal hardship but may adversely affect academic performance. The student may appeal sanctions related to violations of the academic standards and decisions that result in probation and termination in the program. Appeals start at the School level, followed by College and University levels, according to policy.

Academic Standards

1. A grade of D or lower, or course withdrawal, in any required course of the professional program constitutes failure to progress toward the PharmD degree and result in probation.
2. A grade of D or lower, in any elective course of the professional program constitutes failure to progress toward the PharmD degree and result in probation.
3. Students must earn a GPA of 2.000 or better in both University coursework and professional program courses each semester and cumulatively.
4. Students must be considered full time with coursework applicable to the pharmacy degree during each semester while in good standing.
5. Incomplete coursework must be completed prior to progression into the next academic semester and will halt progression in experiential coursework.
6. Students who earn a D or lower in any experiential coursework will have their rotation sequence halted.
7. A course taken in the professional pharmacy program course can be repeated only once.
8. A maximum of three required courses are allowed to be repeated during the degree program.
9. Failure to meet any academic standards for two semesters (not necessarily consecutive) in didactic and/or experiential coursework results in automatic termination from the professional program.
10. Failure of two experiential courses, not necessarily consecutive, results in termination from the professional program.

Elective Credits Policy

The purpose of electives at the School of Pharmacy (SOP) is to complement the pharmacy curriculum, expand knowledge within a specific pharmacy discipline and to ensure completion of the general liberal arts education of the University of Wyoming. Therefore, the

following policies have been approved by the faculty for the Doctor of Pharmacy professional program (hereafter, Program).

1. As published in the University Catalog and SOP students are required to complete a minimum number of electives, specific for the student's year of matriculation into the Program. This number may vary and may be modified as adjustments are made to the professional curriculum to comply with accreditation standards. Students will be made aware of this number during initial orientation into the Program and kept informed of any changes during their stay in the academic program.
2. Students must take elective courses to satisfy first the requirements of the University Studies Program (hereafter, USP) and then complete the remaining required elective credits as general elective coursework (Program-approved required number of elective hours).
3. Students are required to complete all USP requirements even if they exceed the minimum number of elective hours initially defined in their Program in order to graduate from UW.
4. Transfer or online courses from other accredited institutions may be honored as elective credits toward the Program. Students are solely responsible to have all transcripts from other schools sent to the University and make sure that the Manager of Student Services and advisors are aware of any transfer work in the professional program.
5. All required hours (including electives) must be completed by students before progressing into the P4 rotation year. Students will not be allowed to progress toward the 4th year rotations if university studies requirements were not fulfilled.
6. Students shall not take electives as Satisfactory/Unsatisfactory (S/U) credit.
7. All courses taken in the preprofessional program or to fulfill requirements in a previous degree cannot be retaken to count as elective hours in the Program. In addition, students cannot use previously taken credit (prior to the professional program) as elective credit in the professional program.
8. Credit by exam through the Foreign Languages Dept. will not be accepted as fulfillment of elective requirements in the Program. However, it is a student's right to earn credit by exam for Wyoming History and Government, and Physical Education

lecture while receiving elective credits toward the Program and fulfilling USP requirements.

9. For procedures and handling of all exceptions to these policies, the students should consult the SOP brochure, the student handbook, the SOP website, or check with the Manager of Pharmacy Student Services or the Associate Dean of Students.

Curriculum

The School of Pharmacy offers only the four-year curriculum leading to the Doctor of Pharmacy (Pharm.D.) degree.

In order to keep abreast with changes in pharmaceutical education, the following curriculum is subject to change or modification as required by the accrediting agency. Students should be aware that changes must be expected and they will be included in their academic program. The School of Pharmacy does not plan to change graduation requirements inadvertently, but does reserve the right to change any provisions or requirement deemed necessary at any time within the student's term of residence. Students should note that classes are usually scheduled Monday through Friday, but may include some evening and weekend coursework. Required coursework including exams, experiential activities, presentations, etc. may take place outside the scheduled class period.

Doctor of Pharmacy Required Curriculum

ZOO 4125 Integrative Physiology.....	5
PHCY 6100 Dose Form Design	4
PHCY 6106 Pharmaceutical Calculations....	2
PHCY 6110 Medicinal/Natural Products Chemistry I.....	3
PHCY 6140 Intro to Social Admin Pharmacy	3
PHCY 6160 Pharmacist Skills Lab I	1
PHCY 6102 Biopharmaceutics/ Pharmacokinetics	4
PHCY 6111 Medicinal/Natural Products Chemistry II.....	3
PHCY 6120 Advanced Pathophysiology	4
PHCY 6151 Pharmacy Practice Lecture	2
PHCY 6152 Therapeutics I	3
PHCY 6161 Pharmacist Skills Lab II	1
PHCY 6170 Introductory Pharmacy Practice Experience - IPPE 1.....	1
PHCY 6480 Introduction to Community Pharmacy	4
PHCY 6482 Introduction to Institutional Pharmacy	4
PHCY 6215 Medicinal/Natural Products Chemistry	3

PHCY 6230 Pharmacology I.....	4
PHCY 6230 Pharmacology I Discussion	0
PHCY 6240 Research and Evaluation Methods in Pharmacy.....	3
PHCY 6245 Patient/Professional Interactions.....	3
PHCY 6260 Pharmacist Skills III	1
PHCY 6231 Pharmacology II	4
PHCY 6231 Pharmacology II Discussion....	0
PHCY 6246 Pharmacy Management Marketing and Finance.....	3
PHCY 6251 Therapeutics II	3
PHCY 6261 Pharmacist Skills IV	2
PHCY 6270 Introductory Pharmacy Practice Experience - IPPE 2.....	1
PHCY 6312 Clinical Toxicology	3
PHCY 6341 Pharmacy Law	3
PHCY 6344 Pharmacy Ethics	1
PHCY 6350 Therapeutics III	4
PHCY 6357 Clinical Pharmacokinetics.....	2
PHCY 6360 Pharmacist Skills V	1
PHCY 6300 Sterile Products	2
PHCY 6301 Sterile Products Lab	1
PHCY 6340 Health Policy/Advocacy	2
PHCY 6351 Therapeutics IV.....	4
PHCY 6353 Drug Lit Application	2
PHCY 6361 Pharmacist Skills VI	2
PHCY 6370 Introductory Pharmacy Practice Experience - IPPE 3.....	2
PHCY 6485 Reflective Weeks (3).....	3
PHCY 6470 Internal Medicine I.....	4
PHCY 6473 Ambulatory Care.....	4
(Students complete a second semester of either Internal Medicine or Ambulatory Care)	
PHCY 6471 Internal Medicine II	4
PHCY 6474 Ambulatory Care II	4
PHCY 6481 Advanced Community Pharmacy	4
PHCY 6483 Advanced Institutional Pharmacy	4
PHCY 6465 Professional Experience Electives (4)	16
PHCY 6485 Reflective Learning in Pharmacy	3
Students complete 7 hours of electives during the P1-P3 year.	
Total Hours	146

FOURTH YEAR [PH4]: *Consists of nine experiential rotations of four credit hours each and three reflective learning weeks. Rotations are considered full-time. Students may not enroll in any other coursework concurrent with rotations. Consequently, all other coursework (107 credits) must be satisfactorily completed before enrollment in P4 coursework. Note: Students will be required to live in locations other than Laramie when enrolled in experiential rotations. Responsibility for living cost and travel arrangements associated with experiential rotations rests with the*

student. Students participating in all experimental activities will be required to have a vehicle or an acceptable approved alternative.

Students must complete the following Core or Required Experiential Rotations (subject to change):

- 6470-Internal Medicine I
- 6473-Ambulatory Care I
- 6471-Internal Medicine II or
- 6474-Ambulatory Care II
- 6481-Advanced Community Pharmacy
- 6483-Advanced Institutional Pharmacy
- Plus 4 Elective Rotations (PHCY 6465)

Graduate Study

The School of Pharmacy offers the Master of Science in Health Services Administration and the Master of Business Administration/Doctor of Pharmacy (M.B.A./Pharm.D.) dual degree.

M.S. in Health Services Administration

The School of Pharmacy offers a Master of Science online degree in health services administration. This degree is geared toward new and mid-career pharmacists and other health care professionals who want to become department directors, patient safety coordinators and/or directors, regulatory compliance officers, clinical research associates, health outcomes researchers or advance practice pharmacists.

The program also benefits health care workers in fields such as management positions, pharmaceutical sales representatives, medical science liaisons and pharmacy technician educators as well as new clinical faculty at newly established pharmacy colleges.

Available nationwide – excluding students in Massachusetts – the master's program is delivered via a mix of online self-study and online project-based coursework.

The program can be completed in two years of part-time study. Students must travel to the UW Laramie campus for two weekend seminars during the two-year program. Graduates will be expected to complete 30 credit hours of coursework and a comprehensive final exam. Coursework will be completed over five consecutive semesters.

A prospective student should have earned at least a bachelor's degree from a regionally accredited institution. To find out more about the application process please see the following website uwyo.edu/pharmacy/online-ms-program or contact the Student Services Office.

MS-HSA Curriculum

Required Coursework for all tracks

- PHCY 5040 Evolution of American Health Services
 PHCY 5041 Health Services Administration Research Methods
 PHCY 5042 Statistics for Health Services Administration
 PHCY 5045 Health Services Administration Applied Research
 PHCY 5046 Health Services Administration Seminar (initial)
 PHCY 5046 Health Services Administration Seminar (final)

Recommended courses for Biopharmaceutical Regulation & Compliance Track

- PHCY 5241 Intro to Biopharmaceutical Regulation & Compliance
 PHCY 5242 Food & Drug Administration (FDA)
 PHCY 5243 Drug Enforcement Agency (DEA)
 PHCY 5244 State Regulation of Health Professionals
 PHCY 5245 Medicare, Medicaid and ACA Biopharmaceutical Regulation & Compliance students choose 7 additional credits from other tracks or electives

Recommended courses for Healthcare Quality Track

- PHCY 5341 Introduction to Healthcare Quality
 PHCY 5444 Strategic Innovation in Healthcare
 PHCY 5342 Healthcare Risk & Quality
 PHCY 5343 Advanced Topics in Healthcare Quality
 Healthcare Quality students choose 7 additional credits from other tracks or electives

Recommended courses for Health Economics & Outcomes Research (HEOR) Track

- PHCY 5141 Introduction to HEOR
 PHCY 5142 Decision Analysis
 PHCY 5143 Comparative Effectiveness
 PHCY 5144 Patient Reported Outcomes
 PHCY 5043 Empirical Analysis
 Health Economics & Outcomes Research (HEOR) students choose 6 additional credits from other tracks or electives

Recommended courses for Health Institution Leadership Track

- PHCY 5441 Introduction to Health Institution Leadership
 PHCY 5442 Financial Planning

- PHCY 5443 Human Capital
 PHCY 5444 Strategic Innovation in Healthcare
 Health Institution Leadership students choose 9 additional credits from other tracks or electives

Optional electives for all programs (Students can also choose to take a required course from a different track as an elective)

- PHCY 5044 Preventing Fraud, Abuse & Waste
 PHCY 5145 Prescription Benefit Management Decisions
 PHCY 5160 Health Economics & Policy
 Other courses as approved by advisor
**A total of 30 credits are required for graduation. Students can choose from other tracks or electives to maximize their interests and knowledge.*

M.B.A./Pharm.D. Program

The School of Pharmacy offers a M.B.A./Pharm.D. program. This dual degree program is geared toward students who have already obtained a Bachelor's degree. This multidisciplinary graduate program provides pharmacy students with a complementary business degree to start their own business or to advance into management positions during their careers. Students acquire management and leadership decision-making skills that will allow them to excel in their chosen field of practice. A dual M.B.A./Pharm.D. degree allows a student to diversify their skill set and enhance their value to prospective employers.

The Doctor of Pharmacy/Master of Business Administration takes five years to complete – four years of Pharmacy studies and one year of M.B.A. core courses. Students spend their first year (Fall, Spring, and Summer semesters) in the M.B.A. program taking core courses and completing a summer experiential project (30 credits). The next four years will encompass the traditional Pharm.D. curriculum, including the M.B.A. Capstone course in Year 2. Students completing this program will earn a Doctor of Pharmacy degree and a Master of Business Administration degree.

Pharmacy (PHCY)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1101. First-Year Seminar. 3. [(none)▶FYS] 3450 [4450]. Foundational Pathophysiology. 4. Foundational principles of tissue dysfunction and disease, incorporating clinical lab values and human case studies. This course is primarily designed for pre-nursing students

who will transition into their clinical rotations. Students will jointly meet once per week with students within PHCY 6120 for interprofessional education revolving around student-led case study presentations. *Prerequisites:* LIFE 1010, CHEM 1000 or equivalent, and ZOO 3115. (Normally offered spring semester)

4160. Problems in Pharmacy. 1-4 (Max. 8). Original investigation on a library or laboratory problem concerned with a definite phase of work in pharmacy. *Prerequisite:* consent of instructor.

4170. Pharmacy Seminar. 1-4 (Max. 8). Students present oral reports on selected topics of pharmaceutical interest for discussion by the group. *Prerequisite:* consent of instructor.

4210. Regulating Dangerous Drug Use. 2. Regulatory theory and practice is used to study the authority/responsibilities of three federal agencies that are entrusted to ensure the safe, effective, and efficient medication use in the United States. The practices and procedures of the FDA, DEA, and CMS are reviewed, describing why healthcare providers should comply with regulatory principles. Dual listed with PHCY 5210. *Prerequisite:* Upper division undergraduate status or department permission.

4240. Pharmaceutical Homicide. 2. Legal pharmaceutical products are sometimes used by healthcare professional criminals to kill people. This course focuses on identifying the zone of risk for people who could be harmed by pharmaceuticals, and the development of best practices to protect patients and other from the harm. Dual listed with PHCY 5240. *Prerequisite:* Upper division undergraduate status or department permission.

4470 [3510]. Fundamentals of Pharmacology. 4. Studies pharmaceutical agents used for treatment, diagnosis or prevention of disease with particular emphasis on mechanisms of action, therapeutic and adverse effects. *Prerequisite:* PHCY 3450. (Normally offered fall semester)

4670. Healthcare Liability Law. 2. Using a case-study approach, potential legal liability issues are studied, within a health care context that primarily focuses on legal liability related to the use of medications. Strategies for reduction of legal liability are explored. The implementation and oversight of legal risk management programs is addressed. Dual listed with: PHCY 5670. *Prerequisite:* Upper division undergraduate status or department permission.

5040. The Evolution of American Health. 2. This course explores the evolution of the healthcare system in response to various needs and crises over the years. The profes-

sionalization of health care; the development of the modern hospital; the implications of computerized health information; and the empowerment of patients will be covered. *Prerequisite:* Admission into the Health Services Administration MS program.

5041. Health Services Administration Research Methods. 2. This course will cover the basic research designs used in health services research. Focus will be given on framing the research questions, selecting the appropriate study design and threats to the internal validity of the study designs. *Prerequisite:* Must be enrolled in the HSA program.

5042. Statistics for Health Services. 3. This course will introduce students to correlation analysis, regression, analysis of variance and selected non-parametric tests, focusing on appropriate use of each and how to interpret the output of a statistical test to answer a research question. *Prerequisite:* Must be enrolled in the HSA program, or by permission.

5043. Empirical Analysis for Health Services Administration. 3. This course will equip students with an understanding of research and policy debates related to economic, political, and administrative aspects of health services by providing an overview of how research can be used by health service researchers to draw conclusions about health services and their administration. *Prerequisite:* Must be enrolled in the HSA program, or by permission.

5044. Preventing Fraud/Waste/Abuse. 2. Describes potential violations of legal requirements for health institutions and health professionals that can be considered fraud, waste and abuse. Compliance strategies to avoid legal consequences will be discussed. *Prerequisite:* enrollment in graduate or professional program or department permission.

5045. Health Services Administration Applied Research. 1-4. This course provides the opportunity for students to apply knowledge and skills obtained in the HSA program while gaining practical experience with real-world projects. *Prerequisite:* Must be enrolled in the HSA program, or by permission.

5046. Health Services Administration Seminar. 1 (Max. 2). An in-depth investigation of a timely issue in health services, including the regulatory, economic, patient-safety, marketing, leadership, and ethical aspects of that issue. Students will participate in separate group analysis of a presented problem, and in their presentations of their group's assessment of the problem. *Prerequisite:* Completion or concurrent enrollment in PHCY 5040.

5141. Introduction to Health Economics and Outcomes. 3. This course considers the role of the range of outcomes used by clinicians

and health care systems in assessing treatment modalities. The framework for conducting and assessing outcomes research will be emphasized. *Prerequisite:* Completion or concurrent enrollment in PHCY 5040.

5142. Health Economic Decision Analysis. 2. This class is designed to provide the student with the methods of comparative effectiveness research with special focus on how various decision makers use comparative effectiveness data to assist in decision-making. *Prerequisite:* PHCY 5141.

5143. Comparative Effectiveness Research. 2. This class is designed to provide the student with the methods of comparative effectiveness research with special focus on how various decision makers use comparative effectiveness data to assist in decision-making. *Prerequisite:* PHCY 5141.

5144. Patient Reported Outcomes. 2. This course is designed to provide an overview of methods pertaining to the development and evaluation of patient-reported outcome measures (PROs) and the role they play in regulatory, reimbursement, and market access decisions. *Prerequisite:* Admission in the MS in Health Services Administration program.

5145. PBM Decisions. 2. An overview of managed care pharmacy, with a focus on the relationship between cost controls and the access to pharmaceutical products and quality clinical services, and the relationships between, and relative responsibilities of, health plan sponsors, PBMs and providers. *Prerequisite:* Must be enrolled in the HSA program, or by permission.

5146. HEOR Data Analytics - SAS I. 3. An introduction to analyzing medical and pharmacy data using SAS and SQL exploring the complexities of health data, focusing on phases of the data life cycle in health economics and outcomes research, including data validation and manipulation, merging data and creating data sets. *Prerequisite:* Must be enrolled in the HSA program, or by permission.

5147. HEOR Data Analytics - SAS II. 3. This is an introduction to intermediate and advanced methods of analyzing healthcare data focusing on clinical risk adjustment models in SAS. This course will further explore the features and complexities of health data and build upon the Introduction to HEOR Data Analytics Using SAS I. *Prerequisite:* PHCY 5146 and must be enrolled in the HSA program, or by permission.

5148. Health Economics and Policy. 2. This course explores the financing and structure of the U.S. healthcare system with the purpose of understanding how these systems impact patient care, health policy, and economics.

Topics include organization of healthcare systems, insurance programs, legislation, healthcare labor markets and drug costs. *Prerequisite:* Must be enrolled in the HSA program, or by permission.

5160. Graduate Problems Course. 1-6 (max. 12). This course allows in-depth exploration of topics in pharmaceutical sciences, at the graduate level, that are mutually agreed upon by the student and faculty. *Prerequisite:* consent of instructor.

5210. Pharmacy Regulatory Systems. 2. Regulatory theory and practice is used to study the authority/responsibilities of three federal agencies that are entrusted to ensure the safe, effective, and efficient medication use in the United States. The practices and procedures of the FDA, DEA, and CMS are reviewed, describing why healthcare providers should comply with regulatory principles. Dual listed with PHCY 4210. *Prerequisite:* Enrollment in graduate or professional program or department permission.

5240. Pharmaceutical Homicide. 2. Legal pharmaceutical products are sometimes used by healthcare professional criminals to kill people. This course focuses on identifying the zone of risk for people who could be harmed by pharmaceuticals, and the development of best practices to protect patients and other from the harm. Dual listed with PHCY 4240. *Prerequisite:* Enrollment in graduate or professional program or department permission.

5241. Introduction to Biopharmaceutical Regulatory Compliance. 3. This course considers the role of regulatory agencies that prescribe conduct in the healthcare industries and professions, focusing on the Food and Drug Administration. The functioning of other agencies, such as the federal Drug Enforcement Administration, state boards of pharmacy and state departments of health are also considered. *Prerequisite:* Completion or concurrent enrollment in PHCY 5040.

5242. The Food and Drug Administration. 2. This course examines the regulatory climate for FDA-regulated drug and biological products. Regulatory standards are reviewed (including discovery of new therapeutic modalities, their approval, manufacturing, promotion, and distribution), and the enforcement authority of the FDA is examined (focusing on methods that promote safe and effective drug use). *Prerequisite:* PHCY 5241.

5243. The Drug Enforcement Administration. 2. This course examines the balance of health professionals and institutions working with regulators to develop programs that reflect both the best interests of individual

patients and of society. Focusing on challenges of treating chronic pain, prescription drug abuse, and actions that have led to conflict between regulators and health practitioners. *Prerequisite:* PHCY 5241.

5244. State Regulations of Health Professions. 2. This course examines how state regulatory agencies assure the initial competence of practitioners, as well as their continuing competence in the years following the completion of academic training. The course also examines the factors that are applied to the regulation of health care settings, using the structure-process-outcomes typology of Donabedian. *Prerequisite:* PHCY 5241.

5245. Medicare and Medicaid. 2. This course examines the structure, coverage, and operation of federal health programs, with a focus on health policy as reflected in the programs funded by federal resources. The primary focus of the course is on Medicare and Medicaid, and also reviewing other federal programs. *Prerequisite:* Must be enrolled in the HSA program, or by permission.

5341. Introduction to Healthcare Quality. 3 (Max. 3). This course will provide an overview of healthcare quality and performance measurement. It will also provide a review of quality improvement strategies used in various healthcare settings. *Prerequisite:* Must be enrolled in the HSA program, or by permission.

5342. Healthcare Risk and Quality. 3. This course surveys the importance and processes of quality and risk in health care institutions. Students will be assigned to lead topics. Current events/topics will be utilized to inform the class. *Prerequisite:* Must be enrolled in the HSA program, or by permission.

5343. Advanced Topics in Healthcare Quality. 4 (Max. 4). This is an advanced-level course on patient safety and quality improvement strategies in healthcare. The course will utilize many learning resources of the Institute for Healthcare Improvement (IHI) Open School so that students may earn an IHI Certificate. *Prerequisite:* PHCY 5341.

5441. Introduction to Health Leadership. 3. This course will develop the health institution leader through analysis of theory and application to practice by extensive use of case studies and models. Organizational, team and individual dimensions of leadership are examined. Leadership for optimization resources and effective use of data analytics are explored. *Prerequisite:* Must be enrolled in the HSA program, or by permission.

5442. Healthcare Financial Planning. 2. This course explores financial principles incorporating the unique environment of the health institution. The mix of services (inpatient, out-

patient, nursing facilities, urgent/emergency care and components) will be studied through extensive use of case studies and models to develop the health institution leader's financial skills. *Prerequisite:* Must be enrolled in the HSA program, or by permission.

5443. Healthcare Human Capital Plan. 2. This course will provide skills for developing and managing human capital by the health institution leader through exploration of best practices for human capital selection and development to optimize the performance of the workforce while complying with legal, regulatory, and contractual requirements through extensive use of case studies and models. *Prerequisite:* Must be enrolled in the HSA program, or by permission.

5444. Healthcare Strategic Innovation. 2. This course develops strategic skills by the health institution leader through exploration of principles incorporating the unique environment of the health institution. The strategic skills will be applied to the concept of innovation through extensive use of case studies and models. *Prerequisite:* Must be enrolled in the HSA program, or by permission.

5541. Introduction to Biopharmaceutical Marketing and Production. 3. This course will review empirical evidence in various topic areas within the fields of biopharmaceutical marketing, sales promotion, communication, and selling effectiveness focusing on the history and structure of the biopharmaceutical product representative function and theoretical domains associated with the associated activities. *Prerequisite:* Completion or concurrent enrollment in PHCY 5040.

5550. Advanced Cardiovascular Physiology and Pharmacology. 3. An advanced study in the integration of modern cardiovascular physiology, pharmacology, biochemistry and cell biology concepts. Dual listed with PHCY 6550. *Prerequisite:* PHCY 6230 (or equivalent).

5660. Health Care Law. 3. A survey of health care law for students in health care programs, law students, and other matriculated students. Subject matter includes, but is not limited to, the following: malpractice, licensing, informed consent, reform, reproduction and advanced directives. Dual listed with PHCY 4660. *Prerequisite:* consent of instructor.

5670. Health Care Liability Law. 2. Using a case-study approach, potential legal liability issues are studied, within a health care context that primarily focuses on legal liability related to the use of medications. Strategies for reduction of legal liability are explored. The implementation and oversight of legal risk management programs is addressed. Dual

listed with: PHCY 4670. *Prerequisite:* Enrollment in graduate or professional program or department permission.

5887. Molecular Neuropharmacology. 3. Focus on the molecularly-induced functional changes within the nervous system in normal and disease states. In addition, will provide a thorough explanation of the cellular and molecular actions of drugs on synaptic transmission and discuss the neurochemical basis of behavior. *Prerequisites:* PharmD current standing and instructor's permission or NEUR 5280.

5920. Agents for Diagnostic Imaging. 2. Diagnostic Agents is currently designed as a one semester elective course with 2 credit hours. It is an introduction and survey of all diagnostic drugs used in the diagnosis and imaging of disease as approved by the US FDA for use in the United States. *Prerequisites:* PHCY 6211, PHCY 6210, PHCY 6110, CHEM 2440, MOLB 3610.

6040. Post-Graduate Career Planning. 1. This course helps student pharmacists make informed career choices. It is designed to allow students to prepare a CV and enhance a job search, interview and develop cover letter writing skills. Specific discussion topics will be largely focused on students' interest areas. *Prerequisites:* PHCY 6480 or 6482, enrollment in professional PharmD program.

6050. Oncology Therapeutics. 1. This course examines the regulatory climate for FDA-regulated drug and biological products. Regulatory standards are reviewed (including discovery of new therapeutic modalities, their approval, manufacturing, promotion, and distribution), and the enforcement authority of the FDA is examined (focusing on methods that promote safe and effective drug use). *Prerequisite:* PHCY 5241.

6051. Topics in Illicit Drugs. 1. The course will address the basic pharmacology, physical signs of addiction, population demographics, abuse patterns and history of common illicit drugs. The course is designed to raise student awareness of illicit drug addiction. *Prerequisite:* PHCY 6251, enrollment in professional Pharm D program.

6052. Geriatric Pharmacotherapy. 1. Designed to develop the student's knowledge and understanding of geriatric pharmacotherapy through discussion of medical literature, case discussion, and providing patient care under supervision of the faculty member. Emphasis of the course is on class discussion and case-based learning. *Prerequisite:* enrollment in professional PharmD program, P3 status.

6053. Biotechnology. 2. Designed to introduce the student to the most rapidly growing area of biological drug pharmacotherapy which

involves recombinant DNA technology and isolation from natural sources. A combined lecture, discussion of current literature and seminar topics approach is used.

6100. Dose Form Design. 4. Extensively introduces various types of dosage forms, discusses advantages and disadvantages of each. Pharmaceutical calculations are a major component of the course, as well as physicochemical principles involved in dose form stability. *Prerequisites:* CHEM 2420 and 2440.

6102. Biopharmaceutics and Pharmacokinetics. 4. [(none)♦♦] Discusses biopharmaceutic and pharmacokinetic aspects of dosage form design. Basic pharmacokinetics and biopharmaceutics are interrelated to clinical applications. Also covers classical kinetics and dissolution. *Prerequisites:* MATH 2200 and PHCY 6100.

6106 [6105]. Pharmaceutical Calculations. 2. Application of basic mathematics and quantitative reasoning to pharmaceutical calculations, emphasizing calculations of doses, dosage requirements, compounding of formulations and parenterals. *Prerequisites:* MATH 1000 or 1400.

6110. Medicinal and Natural Products Chemistry I. 3. Three-semester series that studies the physicochemical, biochemical and pharmacological properties of substances of natural and synthetic origin that are used as medicinal agents. *Prerequisites:* CHEM 2440 and MOLB 3610.

6111 [6210]. Medicinal and Natural Products Chemistry II. 3. Continuation of Medicinal and Natural Products Chemistry I. *Prerequisite:* Ph1 status in PharmD program or consent of instructor.

6120 [6220]. Advanced Pathophysiology. 3. Advanced course covering the molecular, cellular, genetic and clinical principles of tissue dysfunction and disease, incorporating clinical lab values and human case studies. This course is primarily designed for Doctor of Pharmacy students who will transition into their clinical rotations. Students will jointly meet once per week with students within PHCY 3450 for interprofessional education revolving around student-led case study presentations. *Prerequisites:* LIFE 1010, LIFE 1020, CHEM 1020, CHEM 1030, CHEM 2420, CHEM 2440, MOLB 2240, MOLB 3610, ZOO 3115, ZOO 4125.

6140. Introduction to Social Administrative Pharmacy. 2. Provides an introduction to socio-cultural, behavioral and administrative principles of pharmacy with a focus on pharmacist roles and their historical evolution, health disparities, health behavior theory and practice philosophy, and a survey of the U.S.

health care system. *Prerequisite:* Enrollment in the professional program or consent of instructor.

6151 [6354]. Pharmacy Practice. 2. Provides didactic content that enables students to accurately prepare and dispense prescription medications. *Prerequisite:* enrollment in the doctor of pharmacy professional program.

6152 [6352]. Therapeutics I. 3. Emphasizes the role of the pharmacist in pharmaceutical self care, appropriate triage and referral involving prescription, non-prescription pharmaceuticals, complimentary, alternative therapies and devices in community dwelling patients with both acute and chronic self-care conditions. *Prerequisite:* enrollment in the doctor of pharmacy professional program.

6160 [6101]. Pharmacist Skills I. 1. Preparation and evaluation of dosage forms is main thrust of course. Laboratory emphasizes manipulative and mathematical skills, prescription formats, packaging and storage as they apply to pharmaceuticals. *Prerequisites:* concurrent enrollment in PHCY 6100; MATH 2100.

6161. Pharmacist Skills II. 2. Provides laboratory and other related experiences that enable students to accurately prepare and dispense prescription medications. *Prerequisite:* P1 status in PharmD program or consent of instructor.

6170. Introductory Pharmacy Practice Experience-IPPE1. 1. Provides an early curricular exposure to the roles and functions of pharmacists in their work environment through a shadow experience. *Prerequisite:* satisfactory completion of PHCY 6185.

6215 [6211]. Medicinal and Natural Products Chemistry III. 3. Continuation of Medicinal and Natural Products Chemistry II. *Prerequisite:* PHCY 6111.

6230. Pharmacology I. 4. First semester of a one-year series. Studies action of chemical agents on living systems to include pharmacodynamics, toxicology, and clinical therapeutics. Concepts are emphasized through case presentations and discussion. 4.0 credit hours; lecture with separately scheduled discussion section. *Prerequisite:* PHCY 4450.

6231. Pharmacology II. 4. Second semester of a one-year series. Continuation of PHCY 6230. Lecture with separately scheduled discussion section. *Prerequisite:* PHCY 6230.

6240. Research and Evaluation Methods in Pharmacy. 3. The course focuses on research design and statistical analyses, as well as pharmaco-economic, pharmaco-epidemiology and public health concepts and methods for evidence-based practice applications and health care policy development. *Prerequisites:* MATH 2200 and PharmD program P2 status.

6245. Patient/Professional Interactions. 3. [(none)♦♦COM3] Focuses on psychosocial and communication concepts pertaining to human interactions, with application to professional practice environments and clinical counseling situations. *Prerequisite:* enrollment in the doctor of pharmacy professional program.

6246. Pharmacy Management, Marketing and Finance. 3. Examines management functions and leadership in various types of contemporary pharmacy practice including pharmacy services, drug distribution, technology, human resources, marketing, finance and accounting. *Prerequisite:* P2 status.

6251. Therapeutics II. 3. Introduces pharmaceutical principles employed in the patient care process for managing select disease states and specific patient populations. The course emphasizes the role of evidence-based medicine in developing pharmaceutical care plans (e.g. recommending therapy, evaluating and monitoring the efficacy and safety of medications). *Prerequisites:* PHCY 6120, 6230.

6260. Pharmacist Skills III. 1. This course is the third in a series that will allow students to practice what they learn during didactic class time with an integrated approach that meaningfully pulls in the different subdisciplines represented in the SOP curriculum. *Prerequisite:* P2 status in PharmD program or consent of instructor.

6261. Pharmacist Skills IV. 2. This course is the fourth in a series that will allow students to practice what they learn during didactic class time with an integrated approach that meaningfully pulls in different subdisciplines represented in the SOP curriculum. *Prerequisite:* P2 status in PharmD program or consent of instructor.

6270. Introductory Pharmacy Practice Experience-IPPE2. 1. [(none)♦♦] An advanced exposure to the practice of pharmacy in health care environments. *Prerequisite:* satisfactory completion of PHCY 6170.

6300 [6103]. Sterile Products. 2. An introduction to the preparation and clinical application of sterile dosage forms in accordance with USP 797 and other related standards. Emphasizes basic principles related to preparation, dispensing and administration of parenteral medications in health care settings. *Prerequisites:* PHCY 6100, 6160, 6106, and concurrent enrollment in PHCY 6301.

6301 [6104]. Sterile Products Laboratory. 1. A hands-on training in techniques used to prepare, dispense and administer parenteral admixtures, parenteral nutrition, chemotherapy and ophthalmics forms in accordance with

USP 797 and other related standards. *Prerequisites:* PHCY 6100, 6160, 6106 and concurrent enrollment in PHCY 6300.

6312. Clinical Toxicology. 3. Focuses on biological and pharmacological effects of environmental, chemicals, OTC and prescription drug poisoning cases. Emphasis will be placed on the use of historical, laboratory and clinical data to diagnose and develop clinical management approaches for both acute and chronic poisoning cases. *Prerequisites:* PHCY 6230, MOLB 3610.

6340. Health Care Policy and Advocacy. 2. Prepares the future pharmacist leader to analyze and engage in professional advocacy and the healthcare policy process at the local, state and national level. Content will include details of the U.S. healthcare system, health policy, the policy-making process, key stakeholders' roles, sociocultural influences and current issues. *Prerequisite:* P3 status in PharmD program or consent of instructor.

6341. Pharmacy Practice Law. 3. Coverage of state, federal and local laws and regulations which relate directly to the practice of pharmacy. The Wyoming Pharmacy Act serves as a model for analogous laws in other states. Case law at the federal and state levels affecting pharmacy practice is analyzed and discussed. *Prerequisite:* PH3 or consent of instructor.

6344 [6280, 6385]. Pharmacy Ethics. 1. Focuses on ethical issues confronting pharmacists in practice, pharmacy as a profession, the health care delivery system and society. *Prerequisite:* enrollment in the doctor of pharmacy professional program.

6350. Therapeutics III. 4. Provides an overview of the treatment of selected disease states. Students will develop skills in providing patient-centered care as a medication expert, interpreting evidence, and formulating, monitoring, and adjusting care plans. Course will build upon skills learned in PHCY 6251. *Prerequisite:* grade of C or higher in PHCY 6251.

6351. Therapeutics IV. 4. Provides the student with an overview of the treatment of complex disease states. Students will build on their patient-centered skills from PHCY 6350 by interpreting evidence, prioritizing patient needs, and formulating and monitoring evidence-based care plans. These skills will be essential as students begin advanced pharmacy practice experiences. *Prerequisite:* grade of C or higher in PHCY 6350.

6353. Drug Literature Application. 2. This course is designed to provide students with the fundamental knowledge and skills to practice evidence-based pharmacotherapy. Topics include: evaluation of drug information requests, informatics, understanding

drug information resources, development and execution of search strategies, primary literature and research design analysis, and writing and presentation skills. *Prerequisite:* P3 status in PharmD program or consent of instructor.

6357. Clinical Pharmacokinetics. 2. Course will provide the student with an overview of the clinical application of pharmacokinetic concepts as used in providing quality patient care. Principles of pharmacokinetics may be applied to the therapeutic use of all medications, including those inherently discussed during this course. *Prerequisite:* PHCY 6102.

6360. Pharmacist Skills V. 1. This course is the fifth in a series that will allow students to practice what they learn during didactic class time with an integrated approach that meaningfully pulls in different subdisciplines represented in the SOP curriculum. *Prerequisite:* P3 status in PharmD program or consent of instructor.

6361. Pharmacist Skills VI. 2. This course is the sixth and final course in a series that will allow students to practice what they learn during didactic class time with an integrated approach that meaningfully pulls in different subdisciplines represented in the SOP curriculum. *Prerequisite:* P3 status in PharmD program or consent of instructor.

6370. Introductory Pharmacy Practice Experience-IPPE3. 2. [(none)◀COM3] Designed to prepare the student for 4th year advanced pharmacy practice experience (APPE) activities by discussion of logistics, professionalism, regulatory issues, portfolio requirements and assessment tools. In addition, students will continue building their clinical skills through a patient care practice experience. *Prerequisite:* P3 status in PharmD program or consent of instructor.

6465. Elective Rotation In _____. 4 (Max. 16). Elective advanced pharmacy practice experience that is available in a variety of practice environments (e.g. direct patient care settings, management, research, and other pharmacy-related locations). Rotation requires active participation and application of knowledge, skills, values, and attitudes. *Prerequisite:* grade of C or higher in PHCY 6351 and 6357.

6470. Internal Medicine I. 4. [COM3]. An advanced practice experience to develop skills as a medication expert within an inpatient internal medicine or family medicine experiential setting. Students will coordinate, collaborate, and communicate among themselves, their preceptor, and other members of the interprofessional healthcare team to provide patient-centered care. *Prerequisite:* grade of C or higher in PHCY 6351 and PHCY 6357.

6471. Internal Medicine II. 4. [(none)◀COM3] Course is a continuation of PHCY 6470 in which students take on increasing responsibility and/or more complex patient cases to develop skills as a medication expert in the acute care setting. Students will continue providing patient-centered care by collaborating with their preceptor and other members of the interprofessional healthcare team. *Prerequisite:* PHCY 6470.

6473. Ambulatory Pharmaceutical Care. 4. [(none)◀COM3] An experiential course focusing on the pharmacist as the drug expert in a multidisciplinary health care team. Students will provide direct patient care to patients in an outpatient setting. *Prerequisite:* grade of C or higher in PHCY 6351 and PHCY 6357.

6474. Ambulatory Pharmacy Care II. 4. [COM3] Course is a continuation of PHCY 6473 in which students will take on increasing responsibilities, develop an expanded understanding for systems management, and further advance their clinical skills as medication experts in the outpatient setting. *Prerequisite:* PHCY 6473.

6480. Introduction to Community Pharmacy Practice. 4. Four-week rotation in community pharmacy practice completed under the guidance of a licensed pharmacist. Patient care activities will include, but not be limited to, basic patient and drug therapy assessment, performing medication histories and prospective drug utilization reviews, basic patient counseling and active participation in the medication distribution process. *Prerequisites:* grade of C or higher in PHCY 6352 and 6354 and satisfactory completion of all courses within the P1 curriculum (i.e. P2 standing).

6481. Advanced Community Pharmacy. 4. An advanced practice experience in community pharmacy designed to build upon introductory experiences and promote active participation in caring for patients in this practice setting. Students will spend 25-30% of their time in non-dispensing activities (e.g. screenings, in-depth counseling, MTM, immunizations, self-care treatment, community presentations, etc.). *Prerequisite:* grade of C or higher in PHCY 6351 and PHCY 6357.

6482. Introduction to Hospital Pharmacy Practice. 4. Four-week rotation in hospital pharmacy practice completed under the guidance of a licensed pharmacist. Patient-care activities will include basic drug therapy and patient assessment, prospective drug utilization reviews, participating in the hospital's medication distribution process, performing calculations, compounding preparations and understanding pharmacy's role within the health-system through interdisciplinary in-

teractions. *Prerequisites:* grade of C or higher in PHCY 6352 and 6354 and satisfactory completion of all courses within the P1 curriculum (i.e. P2 standing).

6483. Advanced Institutional Pharmacy.

4. An advanced practice experience in institutional/hospital pharmacy designed to build upon introductory experiences and promote active participation within the health-system through interdisciplinary interactions, projects, presentations, and patient care activities. Students will devote at least 50% of their time to nondispensing activities (e.g. monitoring meds, consults, discharge counseling, medication reconciliation, inservices). *Prerequisite:* grade of C or higher in PHCY 6351 and PHCY 6357.

6485. Reflective Learning in Pharmacy. 1

(Max. 4).[COM3]. Designed to help prepare P4 pharmacy students to be knowledgeable and well-rounded practitioners. Provides an opportunity to reflect on rotation experiences, give professional level presentations, and exposure to content not covered elsewhere in curriculum. Course includes guest speakers, Pharm.D. seminars, assessment activities, job/residency fairs, P4 portfolio, and reflective writing. *Prerequisites:* grade of C or higher in PHCY 6351 and PHCY 6357.

6550. Advanced Cardiovascular Physiology and Pharmacology. 3.

An advanced study in the integration of modern cardiovascular physiology, pharmacology, biochemistry and cell biology concepts. Dual listed with PHCY 5550. *Prerequisites:* PHCY 6230 (or equivalent).

Medical Laboratory Science

Aley Hall, UW-Casper, (307) 268-2753

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Web site: www.uwyo.edu/pharmacy/mls-program/index.html

Director: Jed M. Doxtater, MS MLS (ASCP)^{CM}

Assistant Clinical Faculty:

JED M. DOXTATER, B.S. University of Montana 2007; M.S. University of North Dakota 2013; Assistant Clinical Faculty of Medical Laboratory Science 2015.

Assistant Lecturer

CHARLIE P. CRUZ, B.S. Lorma Colleges 1998; M.A. Don Mariano Marcos Memorial State University 2003; M.S. Lyceum of the Philippines University Batangas 2016; Ph.D. Saint Louis College 2014; Assistant Lecturer of Medical Laboratory Science 2016.

Mission and Goals

The mission of the Bachelor of Science in Medical Laboratory Science program at the University of Wyoming-Casper is to educate, train, and produce highly competent, ethical professionals who are committed to lifelong learning. Curriculum is designed to prepare students to meet current and future workplace challenges and technological advancements in the profession.

Program Goals

1. Provide education in accordance with the National Accrediting Agency for clinical Laboratory Sciences (NAACLS) standards for Medical Laboratory Science programs.
2. Provide students with adequate knowledge and background experience to successfully complete the national certification examination appropriate to their level of training.
3. Provide opportunity for students to develop skills in effective communication sufficient to serve the needs of patients, public, and other healthcare professionals.
4. Graduate well qualified Medical Laboratory Scientists who can function at a career entry level, and are prepared to meet the workforce needs of the state of Wyoming and the nation.
5. Provide students with professional role models so that they may develop and practice professional behaviors, attitudes and ethics necessary to work in, and promote the field of Medical Laboratory Science.
6. Periodically undergo program review to meet the diverse educational needs of students, accreditation standards and industry demands for qualified, skilled entry level practitioners.
7. Establish an advisory board of professionals, community partners and stakeholders for program development, evaluation and improvement.
8. Promote membership and active participation in professional societies.

Outcomes

Description of Entry Level Competencies of the Medical Laboratory Scientist

At entry level, the medical laboratory scientist will possess the entry level competencies necessary to perform the full range of clinical laboratory tests in areas such as Clinical Chemistry, Hematology/Hemostasis, Immunology, Immunohematology/Transfusion medicine,

Microbiology, Urine and Body Fluid Analysis and Laboratory Operations, and other emerging diagnostics, and will play a role in the development and evaluation of test systems and interpretive algorithms.

The medical laboratory scientist will have diverse responsibilities in areas of analysis and clinical decision making, regulatory compliance with applicable regulations, education, and quality assurance/performance improvement wherever laboratory testing is researched, developed or performed.

At entry level, the medical laboratory scientist will have the following basic knowledge and skills in:

- Application of safety and governmental regulations and standards as applied to clinical laboratory science;
- Principles and practices of professional conduct and the significance of continuing professional development;
- Communications sufficient to serve the needs of patients, the public and members of the health care team;
- Principles and practices of administration and supervision as applied to clinical laboratory science;
- Educational methodologies and terminology sufficient to train/educate users and providers of laboratory services;
- Principles and practices of clinical study design, implementation and dissemination of results;
- Theoretical knowledge and technical skills of concepts relating to all content areas required by NAACLS, including Clinical Chemistry, Hematology/Hemostasis, Immunology, Immunohematology, Microbiology, Urine and Body Fluid Analysis, Laboratory Operations and biohazard and safety.

Accreditation

The Medical Laboratory Science Program at the University of Wyoming is accredited by the National Accrediting Agency for Clinical Laboratory Sciences (NAACLS). Accreditation is a process of external peer review in which an agency grants public recognition to a program of study or an institution that meets established qualification and educational standards. Participation in the accreditation process is voluntary since there is not a legal requirement for specialized programs and institutions to participate. However, when students complete

a NAACLS accredited program then become eligible to sit for national certification examinations for the profession.

The National Accrediting Agency for Clinical Laboratory Sciences (NAACLS) is a nonprofit organization that independently accredits medical technologist (MLS), clinical laboratory technician/medical laboratory technician (CLT/MLT), histotechnologist (HTL), histologic technician (HT), pathologists' assistant (Path Asst), diagnostic molecular scientist (DMS) and cytogenetic technology (CT), Phlebotomist (PBT), and clinical assistant (CA) educational programs.

Contract information:

National Accrediting Agency for Clinical Laboratory Sciences, 5600 North River Road, Suite 720, Rosemont, IL 60018-5119

<http://www.naacls.org>

Prerequisites for Admission to the MLS Professional Program

Students must meet the following minimum criteria to be considered for Admitted Major status:

- Completion of the Casper College A.S. degree in MLT within 5 years or B.S. degree in a related science.
- Minimum grade point average (GPA) of 2.000 on all course work transferred into the University of Wyoming at Casper from other academic institutions.
- Successful completion of the Medical Laboratory Technician BOC exam is preferred. Students that have not completed the BOC may be admitted with MLS program directors approval.
- Students admitted to the program that do not hold an A.S. in MLT or a B.S. in a related science may be required to complete the University of Wyoming University Studies program in addition to the basic requirements for the Bachelor of Science in Medical Laboratory Science degree. See the current requirements at <http://www.uwyo.edu/unst/>

Applying for Admission to MLS Professional Program

Students may enter the MLS professional program in the fall or spring semester of their junior year. Application for the program must be submitted to the MLS program director

before finals week of the first semester the student has declared the MLS major and is enrolled in a MLS course.

Prior to participating in the enrichment experiences, students will be subject to that agency's requirements for a background check, drug testing and/or drug abuse prevention policies. Students are then subject to the random drug testing policy of that agency. These background checks are routinely required by schools, hospitals, and other agencies that participate in on-site training. Background check should be obtained from Viewpoint screening (<https://www.viewpointscreening.com/uwyo>). The Casper College MLT background check is a valid substitute if final semester of MLS program falls within 1 year of check.

After completion and submission of the program application, the student must schedule an interview with the program director for an evaluation for acceptance to the MLS program. Interviews must be completed before the student enrolls in the succeeding semester of coursework. It is the students' responsibility to complete and submit applications, and to schedule an interview with the MLS program director by the due dates.

Students are required to complete an observational enrichment experience during the final MLS semester. This observational experience is designed to demonstrate advanced concepts and topics presented in the MLS curriculum, in a practical setting.

The MLS program will provide documentation requirements, as each site may have different requirements for participation (e.g. vaccination records, HIPPA training, safety training, background check/drug screen etc.). If a student finds an appropriate observational enrichment experience outside of the opportunities available through the MLS program, the student must communicate the site to the MLS program director for approval. It will be the responsibility of the student to arrange the experience with the appropriate site personnel/HR, and program director to ensure all required documentation is provided.

Liability insurance will be required for students entering their senior year coursework. Liability insurance is provided through the University of Wyoming at a cost of \$13.00/year to the student.

Health Requirements: The student must provide proof of health insurance and Hepatitis B vaccination (or declination) to participate in on-campus student laboratory sessions. Hepatitis B vaccinations are available on the UW-C campus at student health, or at the

county health department for a small fee. Other health records may be required to participate in enrichment activities including MMR, Tetanus, drug screen, and background check/drug screen.

Essential Functions

Applicants must meet certain essential functions as defined by NAACLS. If you feel that you do not meet these essential functions, careful consideration should be made and advisement received before entering the MLS Program. Essential functions are the abilities and essential functions that a student must be able to perform to be successful in the learning experiences and completion of the program.

Observational Requirements

The MLS student must be able to:

- Observe laboratory demonstrations in which biologicals are tested for their biochemical, hematological, immunological, microbiological, and histochemical components.
- Characterize the color, odor, clarity, and viscosity of biologicals, reagents or chemical reaction products.
- Employ a clinical grade binocular microscope to discriminate among the structural and color (hue, shading, and intensity) differences of microscopic specimens.
- Read and comprehend text, numbers, and graphs displayed in print and on a video monitor.

Movement Requirements

The MLS student must be able to:

- Move freely and safely about a laboratory.
- Reach laboratory bench-tops and shelves, patients lying in hospital beds or patients seated in specimen collection furniture.
- Travel to numerous clinical laboratory sites for practical experience.
- Perform moderately taxing continuous physical work, often requiring prolonged sitting, over several hours.
- Maneuver phlebotomy and culture acquisition equipment to safely collect valid laboratory specimens from patients.
- Control laboratory equipment (i.e., pipettes, inoculating loops, test tubes) and adjust instruments to perform laboratory procedures.

- Use an electronic keyboard to operate laboratory instruments and to calculate, record, evaluate, and transmit laboratory information.
- Perform fine hand manipulations with dexterity.

Communication Requirements

The MLS student must be able to:

- Read and comprehend technical and professional materials.
- Follow verbal and written instructions in order to correctly and independently perform laboratory test procedures.
- Clearly instruct patients prior to specimen collection.
- Effectively, confidentially and sensitively converse with patients regarding laboratory tests.
- Communicate with faculty members, fellow students, staff, and other health care professionals verbally and in a recorded format.
- Independently prepare papers, prepare laboratory reports, and take paper, computer, and laboratory practical examinations.

Behavioral Requirements

The MLS student must:

- Be able to manage the use of time and be able to systematize actions in order to complete professional and technical tasks within realistic constraints.
- Possess the emotional health necessary to effectively employ intellect and exercise appropriate judgment.
- Be able to provide professional and technical services while experiencing the stresses of task-related uncertainty and a distracting environment.
- Be flexible and creative and adapt to professional and technical change.
- Recognize potentially hazardous materials, equipment, and situation and proceed safely in order to minimize risk of injury to patients, self, and nearby individuals.
- Adapt to working with unpleasant biologicals.
- Support and promote the activities of fellow students and of health care professionals.

- Realize that the promotion of peers helps furnish a team approach to learning, task completion, problem solving and patient care.
- Be honest, compassionate, ethical and responsible.

Request for Accommodation

All students are held to the same academic and technical standards. Applicants/students with disabilities seeking accommodation must discuss their disability and accommodation needs with the University Disability Support Services (udss@uwyo.edu or (307) 766-6189; TTY: (307) 766-3073). If appropriate and upon request and registration of the applicant, a reasonable accommodation will be made consistent with University of Wyoming guidelines.

Requirements for the Bachelor of Science in Medical Laboratory Science

The program requires 129 credit hours total, with 60 credit hours obtained in the junior/senior years to graduate. Students must complete a minimum of 42 upper division hours, 30 of which must be earned from the University of Wyoming.

Lower-Division Requirements

MLTK and PEAC courses are available through an articulation agreement with Casper College **and can be taken only through Casper College**. Students are responsible for fulfilling all University Studies requirements. The articulation agreement, with a proposed semester-by-semester sequence, is available at: http://www.uwyo.edu/acadaffairs/degree-plans/_files/2p2/cc_uw_medical-laboratory-science_bs.pdf.

MATH 1400: College Algebra	3
LIFE 1010: General Biology	4
(Casper College equivalent: BIOL 1010)	
MICR/MOLB 2021: General Microbiology	4
(Casper College equivalent: MOLB 2210)	
CHEM 1020: General Chemistry I	4
(Casper College equivalent: CHEM 1025 & CHEM 1028)	
CHEM 1030: General Chemistry II	4
CHEM 2300: Introduction to Organic Chemistry	4
STAT 2050: Fundamentals of Statistics	4
One of the following 3-credit options: SOC 1000 / PSYC 1000 / ANTH 1200 (USP-H)	3
PEAC xxxx: Online Activity.....	1

MLTK 1500: Hematology.....	3
MLTK 1600: Clinical Immunohematology.	3
MLTK 1700: Microscopy: UA Body Fluids.	2
MLTK 2600: Clinical Microbiology I.....	2
MLTK 2500: Clinical Chemistry.....	3
MLTK 2650: Clinical Microbiology II	2
MLTK 2700: Immunology	4
MLTK 2971: Clinical Practicum: Hematology	2
MLTK 2972: Clinical Practicum: Chemistry	2
MLTK 2973: Clinical Practicum: Immunohematology.....	2
MLTK 2974: Clinical Practicum: Microbiology	2
MLTK 2976: Clinical Practicum: Serology..	1
MLTK 2977: Clinical Practicum: UA / Body Fluids	1
MLTK 2978: MLT Professionalism.....	1
MLTK 2800: Clinical Pathophysiology.....	4
MLTK 1800: Principles of Phlebotomy	3

Upper-Division Requirements

Upper-division courses required to complete the Bachelor of Science in Medical Laboratory Science (**All MLSK courses are only available through UW-Casper**):

LIFE 3050: Genetics	4
LIFE 3600: Cell Biology	4
MOLB 3000: Introduction to Molecular Biology	3
MOLB 3610: Principles of Biochemistry	4
Upper-division electives	7
(consult your academic advisor)	
MLSK 4840: Laboratory Education Methodology	1
MLSK 4850: Clinical Research Design.....	2
MLSK 4860: Laboratory Management.....	3
(USP-COM3)	
MLSK 4870: Advanced Clinical Chemistry	4
MLSK 4880: Advanced Hematology: Erythrocytes.....	2
MLSK 4981: Advanced Clinical Practicum: Hematology	3
MLSK 4982: Advanced Clinical Practicum: Molecular	3
MLSK 4983: Advanced Clinical Practicum: Immunohematology	3
MLSK 4984: Advanced Clinical Practicum: Microbiology	3
MLSK 4890: Professional Career Paths and Review	2

Upper Division Elective Credit Hours

Seven upper division elective credit hours must be completed in the student's junior or senior year. These credits must be 3000 and above, and achieved through online outreach or on campus courses. A list of courses that are acceptable to fulfil this requirement can be

made available to the student. If a course is in question, it is highly suggested to the student to contact the UW-C advising department or the MLS program director for requirement fulfillment confirmation.

Enrichment Rotations and Laboratory Sessions

The final semester of the student's senior year is comprised of didactic material being delivered in an online hybrid manner, supplemented with on campus lab sessions at the UW-Casper campus. These lab sessions will be accompanied by an observational enrichment rotation at a clinical site. This enrichment rotation will allow for the observation of advanced methodologies in a practical environment. It will be the students' responsibility for all travel and housing costs associated with the advanced clinical practicum courses.

Probation

Students who do not meet the minimum grade requirements stated above for MLSK course work will be placed on probation. In this period of time, students will be allowed to continue in the program under supervision, but will submit a petition which is an individualized plan of study for the next semester that is developed by the student in agreement with and signed by an academic advisor. All completed MLSK courses that fail to meet minimum grade requirements (C or 2.000 or better) must be repeated by the student. Students shall not be allowed to progress to the final semester until all courses in the previous semesters are successfully completed and a GPA of 2.000 is obtained.

Medical Laboratory Science (MLSK)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

4840. Laboratory Education Methodology.

1. This course provides an overview of education methodology and issues related to roles as educators in the clinical laboratory profession. Course topics and assignments include pedagogy, curriculum design, assessment and accreditation. Major educational responsibilities for clinical laboratory professionals relating to continuing education, competency assurance, certification and licensure will be addressed. *Prerequisite:* Medical Laboratory Technician (ASCP) certification or completion of an associate of science degree in medical laboratory technician within 5 years.

4850. Clinical Research Design. 2. A course in research design methods commonly used in clinical research. Emphasis is on research design, process, measurement, regulatory issues, and ethics, as used by investigators. The focus is to equip students with knowledge and skills necessary to critically examine professional literature, methodology and ethical considerations that influence research design. *Prerequisite:* Medical Laboratory Technician (ASCP) certification or completion of an associate of science degree in medical laboratory technician within 5 years.

4860. Laboratory Management. 3. [(none)♦COM3] This course introduces students to laboratory management systems, testing, reimbursement, accrediting/regulatory issues, finances, information systems, QA/QC improvement and supervisory roles in the clinical laboratory. Emphasis is on management and communication skills needed to work successfully as entry-level professionals in a health care setting. *Prerequisite:* Medical Laboratory Technician (ASCP) certification or completion of an associate of science degree in medical laboratory technician within 5 years.

4870. Advanced Clinical Chemistry. 4. This course is designed to introduce students to advanced topics in clinical chemistry in relation to instrumentation, diagnostic testing and its correlation to disease states, and method correlation and validation. Students will demonstrate the ability to describe principles and applications required for the entry level laboratory scientist. *Prerequisite:* Medical Laboratory Technician (ASCP) certification or completion of an AS degree in MLT within the past 5 years.

4880. Advanced Hematology: Erythrocytes. 2. Advanced hematology principles and techniques prepare students for practice in the clinical laboratory. This course will focus on advanced topics of hematology, focusing on normal and abnormal erythrocytes in relation to assessment, and disease correlation. *Prerequisite:* Medical Laboratory Technician (ASCP) certification or completion of an AS degree in MLT within the past 5 years.

4890. Professional Career Paths and Review. 2. This Medical Laboratory Sciences program prepares students for a variety of graduate degrees and careers in laboratory medicine. This course is designed to help students investigate career and education opportunities after becoming a certified Medical Laboratory Scientist and also provides students with a cumulative review to ensure mastery of content. *Prerequisite:* Medical Laboratory Technician (ASCP) certification or completion of an AS degree in MLT within the past 5 years.

4981. Advanced Clinical Practicum - Hematology. 3. Advanced hematology principles and techniques prepare students for practice in the clinical laboratory. Topics include leukopoiesis, leukemias, lymphomas, hemostasis, coagulopathies, urinalysis and body fluids. Laboratory will focus on abnormal smears, normal and leukemic bone marrow evaluations, and coagulation mixing studies, factor assays and body fluids related to clinical disease states. *Prerequisite:* Medical Laboratory Technician (ASCP) certification or completion of an associate of science degree in medical laboratory technician within 5 years.

4982. Advanced Clinical Practicum - Molecular. 3. Principles of molecular technology used in clinical laboratories. Laboratory experiences include cytogenetics, nucleic acid extraction, hybridization, detection, amplification, sequencing, microarrays, and in-situ hybridization. Emphasis is on the areas of the clinical laboratory that use molecular techniques related to genetics, oncology, infectious disease, and identity testing for forensic and transplant purposes. *Prerequisite:* Medical Laboratory Technician (ASCP) certification or completion of an associate of science degree in medical laboratory technician within 5 years.

4983. Advanced Clinical Practicum - Immunohematology. 3. Principles of immunology theory, blood group systems, genetics, and immunohematology techniques. Procedures including evaluation of blood samples, pre-transfusion compatibility testing, and transfusion reactions are studied. Serologic testing and problem-solving in antibody identification and complex procedures are stressed. Laboratory emphasizes modern practices, resolution of compatibility problems and advanced antibody identification methods. *Prerequisite:* Medical Laboratory Technician (ASCP) certification or completion of an associate of science degree in medical laboratory technician within 5 years.

4984. Advanced Clinical Practicum-Microbiology. 3. Focus is on underlying mechanisms of microbial pathogenesis, host responses to infectious disease and clinical diagnosis procedures. Emphasis is on detailed mechanisms of infection, pathogenesis, and major discoveries and technologies in medical microbiology. Current issues in public and global health, epidemiology, bioterrorism, biotechnology and vaccination programs will be studied. *Prerequisite:* Medical Laboratory Technician (ASCP) certification or completion of an associate of science degree in medical laboratory technician within 5 years.

Division of Social Work

Health Sciences Building, (307) 766-6112

FAX: (307) 766-6839

Web site: www.uwyo.edu/socialwork

Director: Eleanor Pepi Downey, M.S.W., Ph.D.

Associate Professors:

ELEANOR PEPI DOWNEY, B.A. Queens College (NC) 1962; M.S.W. Rutgers University 1971; Ph.D. University of Denver 1998; Associate Professor of Social Work 2019.

DIANE A. KEMPSON, B.A. Columbia College 1968; M.S.W. Florida State University 1970; Ph.D. University of South Carolina 1998; Associate Professor of Social Work 2010.

NEELY MAHAPATRA, B.Sc. Utkal University, India 1991; M.Sc. 1993; M.S.S.W. University of Texas-Austin 2003; Ph.D. 2008; Associate Professor of Social Work 2016.

VALERIE THOMPSON-EBANKS, B.Sc. University of the West Indies 2002; M.S.W. 2007; Ph.D. Colorado State University 2012; Associate Professor of Social Work 2018.

Assistant Professors:

KIRSTEN HAVIG, B.A. University of Missouri 1994; M.S.W. University of South Carolina 1998; Ph.D. University of Missouri 2010; Assistant Professor of Social Work 2016.

SANDY LEOTTI, B.A. Prescott College 2002; M.S.W. University of Montana 2006; Ph.D. Portland State University 2019; Assistant Professor of Social Work 2019.

SUKYUNG YOON, B.A. Chung-Ang University 2002; M.S.W. Yonsei University 2008; Ph.D. University of Tennessee 2019; Assistant Professor of Social Work 2019.

Assistant Lecturers:

BILLIE CHAPMAN, B.A. University of Wyoming 2005; M.S.W. 2008; Assistant Lecturer of Social Work 2018.

KYM CODALLOS, B.A. California State University, Sacramento 1999; M.S.W. California State University, Stanislaus 2006; M.A. 2011; Assistant Lecturer of Social Work 2018.

GRETA MAXFIELD, B.S. University of Wyoming 1994; M.S.W. Washington University 1999; Assistant Lecturer of Social Work 2019.

Social workers are uniquely qualified to help people in their own environments by looking at different aspects of their lives and cultures. We work to ensure the client's personal well-being, prevent crises, counsel individuals, support families, and strengthen communities. We make sure people get the help they need, with the best resources available.

For more than 100 years, social workers have cared for people in every stage of life. Social workers help others overcome life's most difficult challenges and manage the troubles of everyday living, including the troubles that exist due to poverty, stress, addiction, abuse, unemployment, mental illness, family change, and social violence. Social workers advocate for social justice.

Undergraduate Study

The Division of Social Work prepares students for entry-level generalist social work practice. Two locations offer the social work program: the Laramie campus and the University of Wyoming-Casper campus. Graduates receive a Bachelor of Social Work (BSW) and are prepared to work as generalist social work practitioners with individuals, groups, families, organizations, communities, and institutions to achieve more effective and efficient social functioning.

Our program is accredited by the Council on Social Work Education. The curriculum is designed to help students acquire important knowledge and skills in the areas of values and ethics, diversity, social and economic justice, human behavior and the social environment, social welfare policy and services, social work practice, and research. A competency-based curriculum prepares students to meet an "initial level" of competence in nine core areas (CSWE, 2015). Students also select elective courses in areas such as aging, child and adolescent services, health and mental health, and disability services. The program culminates in a 450-hour supervised field practicum, which allows students to work as social workers in one of Wyoming's many human service agencies.

Social Work Major

Social work is a professional degree program. Prior to admission to the professional degree program, declared social work majors are considered Tracking Majors. Typically students apply to the professional degree program the spring semester of their sophomore year. Acceptance to Admitted Major (professional degree program) is competitive and requires an application. Please see application requirements on the Division of Social Work website. Students accepted into the professional degree program are expected to complete their degree in a timely manner. Students who have not completed social work classes for one year or more must reapply for Admitted Major and submit a plan for readiness to continue in the social work degree program. A plan may

include, but is not limited to, repeating or auditing a course taken at an earlier point in the student's academic experience, completing an independent study that may provide updated social work content for the student, demonstrating knowledge or practice skills. Readmission is not guaranteed.

Criteria for Admission as an Admitted Major

The admissions process is competitive. Students must meet the following minimum criteria to be considered for Admitted Major status.

1. Students must earn a minimum grade point average (GPA) of 2.500 on all UW course work as well as all course work transferred into the University of Wyoming from other academic institutions.
2. Complete the following prerequisites:
 - a. SOC 1000
 - b. PSYC 1000
 - c. POLS 1000
 - d. SOWK 2000
 - e. Human Biology (KIN/ZOO 2040 or PSYC 2080)
 - f. STAT 2070
 - g. ECON 1010
3. Students must earn a grade of C or higher in all SOWK prerequisite classes.
4. Students must adhere to the UW Student Code of Conduct and the NASW Code of Ethics.
5. Students cannot exhibit behavior that will impinge on the student's present or future ability to fulfill professional responsibilities as a social work professional.
6. All students seeking admission to programs in the College of Health Sciences are required to undergo a background check as specified by college policy. Criminal convictions may result in rejection of the candidate for admission to Admitted Major.
7. Students must submit an application and an application fee. (See UW Fee Book)
8. Applicants to the social work program cannot receive credit for life experience.

Requirements for Admitted Majors

Once admitted, social work students must:

1. Achieve a C or better in all social work courses, including six hours of required social work electives.
2. Social work classes are offered and must be completed in sequential order.

3. Maintain a 2.500 or above GPA overall every semester after admittance to Admitted Major.
4. Maintain a 2.500 or above GPA overall in all social work course work every semester after admittance to Admitted Major.
5. Registration is restricted and students must meet with their advisor each semester for enrollment.
6. Complete SOWK 4990 with a satisfactory grade.
7. Students must adhere to the UW Student Code of Conduct and the NASW Code of Ethics.

Individuals failing to meet any of the above requirements will be reviewed by faculty and one of the following actions may be taken: remediation, probation, sanction, and/or dismissal from the program. Because many social work courses have prerequisite requirements, receiving a grade lower than a C in a social work course may prevent the individual from moving forward in the social work program.

BSW Field Practicum

All students complete a 450-hour (10 credit hours) field practicum experience in a community-based social agency or social program. Field practicum sites exist throughout the state of Wyoming and students may be placed outside Laramie. Students apply for this program the semester before their actual placement. Students must complete a Field Placement Application and meet with the Field Coordinator prior to determining a practicum site (please review Field Practicum Manual). Background checks and drug screenings may be required by some agencies even though the College of Health Sciences has received a background check during admission to the major.

For the practicum, a grade of U is interpreted as performing below expectations and will not be considered satisfactory completion of the practicum, hence of the BSW program. Based on input from the student, the field instructor, and the faculty liaison during the field evaluation, the field coordinator will determine what remediation would be required. The plan will clarify course objectives and professional skills upon which the student needs to improve. A student wishing to continue in the program would need to reapply for a field placement. Upon the field committee's approval of the request for placement, the student may then repeat the practicum experience. Consistent with University policy, the most recent grade would be the grade calculated into the GPA. The grade of U is interpreted

as not meeting minimal requirements of the course; failure to complete the minimum clock hours in the field placement; failure to complete written assignments in a satisfactory manner; violation of one or more of the tenets of the NASW Code of Ethics (see Appendix B and Termination of Practicum section in the practicum manual); and/or failure to withdraw formally or to terminate the course. A student receiving an U in the practicum will be automatically dismissed from the BSW program with no opportunity to reapply or re-enter. Grades and dismissals may be appealed. (See most current BSW Student Handbook for appeal procedures.)

Requirements for Graduation

The program requires 120 credit hours to graduate. Students must have completed all social work requirements, 42 upper-division hours, maintain a 2.500 GPA overall, a 2.500 GPA in social work coursework, and have achieved a grade of C or better in all social work courses. Courses must be taken for a letter grade unless offered for S/U only. USP H and PN courses must be taken outside the major subject, but can be cross listed with the major.

BSW Curriculum

See the 4-year degree plan at: <http://www.uwyo.edu/acadaffairs/degree-plans/uw-4-year-plans/health-sciences/index.html>.

Prerequisites for admission into the BSW program includes a C or higher in the following courses:

SOC 1000: Sociological Principles	3
PSYC 1000: General Psychology	3
POLS 1000: American and Wyoming Government	3
SOWK 2000: Introduction to Social Work	3
Human Biology	3
(KIN 2040: Human Anatomy or PSYC 2080: Biological Psychology)*	
STAT 2070: Introduction to Statistics for the Social Sciences	4
ECON 1010: Principles of Macroeconomics.....	3

*This requires a prerequisite biology course, usually LIFE 1003: Current Issues in Biology. 4.

Below are suggested lower-division electives that can be taken before admission into the BSW program. Consult with your academic advisor to determine the best electives for your particular interests or needs. It may be worthwhile to add a minor to your degree.

SPAN 1010: First Year Spanish I.....	4
(USP-H)	
SPAN 1020: First Year Spanish II.....	4

RELI 1000: Introduction to Religion.....	3
WIND 2100: Introduction to Disability Studies	3
SOC 2350: Race and Ethnic Relations.....	3
Suggested upper-division electives (consult with your advisor):	
FCSC 3100: Personal Finance	3
FCSC 4112: Family Decision and Resource Management.....	3
Required courses after admission into the BSW program:	
SOWK 3530: Human Behavior and the Social Environment I	3
SOWK 3630: Generalist Social Work Practice I: Individuals and Families.....	3
SOWK 3645: Ethical Social Work Practice.	3
SOWK 4060: Diversity and Difference in Social Work Practice	3
SOWK 3540: Human Behavior and the Social Environment II.....	3
SOWK 3640: Generalist Social Work Practice II: Groups.....	3
SOWK 3650: Generalist Social Work Practice III: Communities and Organizations.....	3
SOWK 4850: Human Rights, Social Justice and Social Policy.....	3
SOWK 4560: Social Work Research	3
SOWK 4990: Social Work Practicum.....	5
(5 credits each semester of final year)	
SOWK 4991: BSW Field Seminar I.....	2
SOWK 4570: Research-Informed Practice..	3
(USP-COM3)	
SOWK 4992: BSW Field Seminar II.....	2
Social Work electives	6
selected with advisor consultation	
Suggested upper-division electives (consult with your advisor):	
FCSC 3110: Personal Finance.....	3
FCSC 4112: Family Decision & Resource Management.....	3

Graduate Study

The Master of Social Work (MSW) prepares professional social workers for advanced level social work practice and leadership positions in rural human service environments. The Advanced Generalist MSW program is accredited by the Council on Social Work Education. The MSW program graduates advanced integrated practitioners who work within and negotiate complex multi-dimensional problem settings for both clients and practitioners while embracing the profession's values of service, social justice, dignity and worth of the person, importance of human relationships, integrity, competence, human rights, and scientific inquiry. The MSW is a full time, campus-based

program that utilizes different course delivery methods to accommodate its widespread student population.

Certificate Program

School Social Work

See website for details and course requirements.

Graduate Admissions Requirements

The Division of Social Work's Graduate Admissions Committee bases recommendations on review of all application materials (applicant's grades, personal statement, academic essay, professional references, and any related social service experience) as they reflect the applicant's commitment to social work, social and economic justice, values and ethics of the social work profession, and applicant's potential as a graduate student, social work practitioner, colleague and leader in the social work field. The Committee also looks for the intangible qualities that an applicant brings to the classroom and campus environment and to professional social work.

Once the committee recommends admission of an applicant, the Office of Admissions in Academic Affairs makes the final decision of admission.

Requirements for the Standard MSW Program

- A baccalaureate degree from a nationally accredited college or university that reflects a broad liberal arts preparation. This consists of having completed at least 21 credit hours in social and behavioral sciences and 6 credit hours each in natural sciences, humanities, visual and performing arts, and quantitative reasoning;
- A human biology course (beyond introductory biology), receiving a grade of C or better;
- A statistics course, receiving a grade of C or better;
- An undergraduate cumulative grade point average (GPA) of 3.000 or above on a 4-point scale.

Requirements for the Advanced Standing MSW Program

- A bachelor's degree in Social Work from a Council on Social Work Education accredited social work program;
- An undergraduate social work GPA of 3.250 or above;
- An overall undergraduate GPA of 3.000 or above;

- Received a B or better and/or a Satisfactory grade in BSW Field Education Practicum.

*International students have special requirements for admission to UW. All are encouraged to contact the International Programs office for details before applying.

All Applicants

All applicants will be evaluated on the their:

- Intellectual and personal qualities essential to the successful practice of social work, such as sensitivity and responsiveness in relationships, concern for the needs of others, adaptability, good judgment, creativity and integrity;
- Commitment to social justice and equality;
- Written and verbal communication skills;
- Professional references; and
- Compatibility of career goals with the MSW program's advanced generalist perspective.

All applicants meeting minimum criteria will be considered for admission. Admitted applicants will be required to complete a criminal background check through the College of Health Sciences.

Program Specific Degree Requirements

All incoming students enter the MSW program in the summer semester of their first year, completing introductory and/or bridge courses as needed for their specific program phase. The MSW program is divided into two phases: generalist and advanced generalist. The foundation year of the MSW program prepares students without a BSW degree for the advanced generalist curriculum in the second year. Students who have already obtained their BSW degree may apply for Advanced Generalist in the MSW program. These students complete only the second year courses.

Master of Social Work Field Practicum

All students, regardless of status, participate in a field practicum experience, starting in their first fall semester. New students submit an initial application for placement during their first summer of classes.

Foundation students will complete 900 hours in practicum over the course of their two years of study, 400 and 500 hours respectively. Advanced Standing students will complete 500 hours in their one year of study. All students in practicum will take a corresponding field seminar class each semester.

Grading is done as Satisfactory/Unsatisfactory. Receiving a grade of U is considered a failing grade and can result in termination from the practicum. If the practicum is terminated, the student may be offered a remediation plan to retake the required hours. This opportunity is only offered one time. The student may also be referred to the DOSW faculty for review according to the Student Academic and Professional Performance policy.

Specific information and procedures relating to all aspects of the field practicum experience can be found in the Field Practicum Manual located on the Division of Social Work's website.

Master of Social Work Plan A - Thesis

Students complete all SOWK required courses except SOWK 5755.

Plan A students register for SOWK 5960 Thesis Research.

Students registering for the Plan A option are required to carry out original research.

Thesis proposal defense, thesis implementation, and final defense are required.

Plan A students may write a monograph fully detailing their research or a publishable peer-refereed journal article, determined in consultation with the student's Research Chair and in accordance with the UW Thesis requirements.

The thesis requires a minimum of 4 credit hours, usually taken as 2 credits in the fall semester and 2 credits in the spring of advanced year.

Plan B - Practice Evaluation

Students complete all SOWK required courses except SOWK 5960. Plan B students register for SOWK 5755. Students registering for the Plan B option will conduct a practice evaluation with their advanced year practicum setting. Proposal defense and a final written paper with oral defense are required.

The practice evaluation requires a minimum of 2 credit hours, usually taken as 1 credit in the fall semester and 1 credit in the spring of the advanced year.

Social Work (SOWK)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

1900. Women and Leadership. 3. [O,L♦(none)] Students examine theoretical, historical, and cultural aspects of leadership, grassroots women's leadership, values in leadership, gender differences in leadership styles, and practical applications of leadership skills through oral communication and information literacy. Individual and collaborative work is expected. Cross listed with WMST 1900. *Prerequisites:* one course in women's studies.

2000 [3000]. Introduction to Social Work. 3. Introduces social work and social welfare through an overview of the history, philosophy, ethics, values, methods, and fields of practice to generalist social work.

3530. Human Behavior and the Social Environment I. 3. Covers theories and knowledge of human bio-psycho-social-spiritual development and social interactions within a systems framework. Introduces theories of individuals and families and their development. Paradigms of culture, marginalization and oppression are examined. *Prerequisite:* admitted social work major status.

3540. Human Behavior and Social Environment II. 3. Covers theories and knowledge of human bio-psycho-social-spiritual development and social interactions within a systems framework, with a focus on groups, communities, organizations and institutions. *Prerequisites:* SOWK 3530 with a C or better and admitted social work major status.

3630. Generalist Social Work Practice I, Individual and Families. 3. Introduces generalist social work practice at all systems' levels, with focus on individuals and families. It covers the nature of social work practice, theoretical perspectives, ethics and values, engagement, assessment, intervention and evaluation processes and skills. *Prerequisite:* admitted social work major status.

3640. Generalist Social Work Practice II, Groups. 3. Focuses on group work within the generalist social work perspective, covering theoretical perspectives, ethics and values, and problem-solving skills applied to task and treatment groups. *Prerequisites:* SOWK 3630 and 3530 with a C or better and admitted major status.

3645. Ethical Social Work Practice. 3. Focuses on the ethical principles that undergird the practice of social work, addresses how to practice ethically, and explores the process of ethical decision-making. Social work practice

with various client systems will be considered, as well as practice in varied settings. *Prerequisite:* admitted social work major status.

3650. Generalist Social Work Practice III; Communities and Organizations. 3. Teaches engagement, assessment, intervention and evaluation with organizations, communities and institutions within the generalist social work perspective. *Prerequisites:* SOWK 3630 with a C or better; SOWK 3540 pre or concurrent; admitted social work major status.

4020. Disability Studies Theory and Practice. 3.[CS♦COM3] Explores the interdisciplinary nature of disability studies theory and scholarship, including investigation of embodied knowledge, cultural meanings, and socio-political practices related to disability. Students will develop in-depth critical disability research papers and deliver accessible, professional presentations. Dual listed with SOWK 5020; cross listed with WIND 4020. *Prerequisite:* WIND 2100 or WB/COM2.

4060. Diversity and Difference in Social Work Practice. 3. [D♦(none)] Practice class examines social works' roles and issues related to human diversity. Social work values and ethics and social and economic justice are explored throughout. *Prerequisite:* admitted social work major status.

4083. Social Work and Health Care. 3. Identifies and addresses social work issues related to health, such as medical social work, public health, and health promotion. Dual listed with SOWK 5083. *Prerequisites:* SOWK 3630 and Admitted Major status; a WB or COM2 course and junior standing for non-social work majors.

4084. Professional Social Work Practice: Alcohol and Other Drugs. 3. Examines alcohol and substance abuse and social work's role in varied practice settings. Issues explored include medical considerations in alcohol abuse, social and familial challenges, as well as social work values and ethics, and concern for populations-at-risk. Dual listed with SOWK 5084. *Prerequisites:* SOWK 3630 and Admitted Major status; a WB or COM2 course and junior standing for non-social work majors.

4480. Introduction to Aging Services. 3. Surveys issues in aging and social work's role, status and function in the field of gerontology. *Prerequisite:* SOWK 2000 or consent of instructor.

4550 [3550]. Child Welfare Services. 3. Examines issues of child and family welfare in the context of national, state, and local policy and practice. Social and economic justice are examined as they relate to interventions with children and families. Dual listed with SOWK 5550. *Prerequisites:* SOWK 2000; SOWK 3530.

4560. Social Work Research. 3. Introduces social work research and practice evaluation. Prepares students to use research in practice. *Prerequisites:* STAT 2050 or 2070 with a grade of C or better and admitted social work major status.

4570. Research-Informed Practice. 3. [WC♦COM3] Learn about and engage in methods of research applicable to their social work practice. Competence in methods such as single system design and program evaluation will be assessed in this course. *Prerequisites:* SOWK 4560 with a C or better and admitted social work major status.

4780. Seminar: _____ 1-9 (Max. 15). Consideration of special topics of current interest in social work. May be repeated for a maximum of 15 hours credit when the seminar topic is different. *Prerequisite:* advanced major status; or consent of instructor and junior standing for non-social work majors.

4850. Human Rights, Social Justice and Social Policy. 3. Examines human rights, social welfare policy, and social, political and economic justice, as well as systems that oppress and create injustice, both in the US and internationally. A focus of the course will be the analysis of social welfare policy as it affects social justice issues. *Prerequisites:* SOWK 4060, ECON 1010, and admitted social work major status.

4881. International Social Welfare and Social Development. 3. [G♦(none)] Examines the basic framework of social welfare analysis and social development programming in the international arena, employing a multinational comparative analysis approach to explore the wide array of responses to social need across the globe. Students employ multinational comparative analyses to an area of social concern. Dual listed with SOWK 5881; cross listed with INST 4881. *Prerequisite:* POLS 1000; ECON 1010 recommended.

4980. Independent Study. 1-3 (Max. 6). Consideration of topics of current social work interest in consultation with a member of the faculty. *Prerequisites:* advanced major status and consent of instructor.

4990. Social Work Practicum. 5-10 (Max. 10). Represents the culmination of preparation for entry level generalist social work practice. Supervised practice in the knowledge, values and skills learned in the classroom. Offered S/U only. *Prerequisites:* SOWK 3640, 3650 and application to the field program.

4991. BSW Field Suminar I. 2. Develops and supports student integration of classroom and field practicum experiences in a final demonstration of competencies for the beginning

practitioner. This course is taken in Fall, concurrent with 4990, Field Practicum. *Prerequisite:* concurrent enrollment in SOWK 4990.

4992. BSW Field Seminar II. 2. Develops and supports student integration of classroom and field practicum experiences in a final demonstration of competencies for the beginning practitioner. *Prerequisite:* taken concurrently with SOWK 4990, Field Practicum.

5000. Topics: Social Work. 1-3 (Max. 15). Various advanced topics in social work will be presented. May be repeated for a maximum of 15 hours when offered for different topics. *Prerequisite:* bachelor's degree; 18 hours in socio/behavioral sciences preferred.

5020. Disability Studies Theory and Practice. 3. Explores the interdisciplinary nature of disability studies theory and scholarship, including investigation of embodied knowledge, cultural meanings, and socio-political practices related to disability. Students will develop in-depth critical disability research papers and deliver accessible, professional presentations. Dual listed with SOWK 4020; cross listed with WIND 5020.

5081. Assessment and The DSM. 3. Through a psychiatric social work lens students will become familiar with the process of conducting a diagnostic interview, writing psychiatric assessment including a mental status exam and formulating a diagnosis using the Diagnostic and Statistical Manual of Mental Disorders. This course assumes some knowledge of mental health and mental illness. *Prerequisite:* graduate standing.

5084. Professional Social Work Practice: Alcohol and Other Drugs. 3. Examines alcohol and substance abuse and social work's role in varied practice settings. Issues explored include medical considerations in alcohol abuse, social and familial challenges, as well as social work values and ethics, and concern for populations-at-risk. Dual listed with SOWK 4084. *Prerequisites:* SOWK 3630 and Admitted Major status; a WB or COM2 course and junior standing for non-social work majors.

5100. Principles and Philosophy of Social Work. 3. Explores the history, traditions, ethics, purpose, philosophy, and knowledge base of the social work profession. Introduces the 10 core competencies of the MSW curriculum and the generalist social work perspective in rural settings using the problem-solving approach. *Prerequisite:* admission into the MSW program.

5115. Social Welfare Policy: Human Rights and Social Justice. 3. Examines human rights and social and economic justice from a social work perspective, as well as systems

that oppress and create injustice in the US and internationally. *Prerequisite:* admission to the MSW program.

5120. MSW Foundation Field Seminar I. 1. Develops and supports student integration of classroom and field practicum experiences in a seminar-style discussion of core competencies for the foundation year MSW student. *Prerequisites:* taken concurrently with SOWK 5450.

5121. MSW Foundation Field Seminar II. 1. Develops and supports student integration of classroom and field practicum experiences in the 2nd seminar-style discussion course of core competence for the foundation year MSW student. *Prerequisite:* taken concurrently with SOWK 5460.

5200. Human Behavior and the Social Environment I. 3. A theoretical examination of human behavior and the social environment, focusing on individuals, families and small groups in the context of human life cycle development. Emphasizes issues of human diversity and social and economic justice in the context of the environment. *Prerequisites:* admission into the MSW program and either completion of SOWK 5100 or concurrent enrollment.

5210. Human Behavior and the Social Environment II. 3. A theoretical examination of human behavior in the social environment, focusing on groups, communities, organizations and institutions. Emphasizes issues of human diversity and social economic justice. *Prerequisite:* SOWK 5200.

5300. Generalist Social Work Practice I. 3. Applies social work skills, values, and knowledge to a range of human service settings in a rural state. Emphasis is on general methods within a systems and problem-solving framework. Covers assessment and intervention with individuals and families. Addresses ethics and diversity throughout the course. *Prerequisite:* admission into the MSW program.

5310. Generalist Social Work Practice II. 3. Applies social work skills, values and knowledge to the engagement, assessment, intervention and evaluation processes with groups, organizations and communities. Emphasis on ethics and diversity in practice. *Prerequisite:* admission into the MSW program; must have completed SOWK 5300.

5400. Social Work Generalist Research Methods. 3. Covers design, implementation and interpretation of research in social work practice settings. Presents methods of program evaluation and practice research at all system levels using both quantitative and qualitative research methodologies. *Prerequisite:* admission into the MSW program.

5450. Field Practicum I. 3. Provides the opportunity for students to learn through experience the skills of entry-level generalist social work practice. The course consists of supervised practice, in a community service agency, of social work knowledge, values and skills learned in the classroom. *Prerequisites:* Students must have completed, or be concurrently enrolled in, SOWK 5100, SOWK 5200, SOWK 5300, and SOWK 5400.

5460. Field Practicum II. 5-10 (Max. 10). Provides the opportunity for students to learn through experience the skills of entry-level generalist social work practice. The course consists of supervised practice, in a community service agency, of social work knowledge, values and skills learned in the classroom. *Prerequisite:* SOWK 5450.

5495. Social Work Research and Analysis. 3. Designed for MSW advanced standing students to address research methods and analysis in the context of the generalist problem-solving approach. *Prerequisite:* admission to the MSW advanced standing program; concurrent enrollment in SOWK 5499.

5499. Social Work Generalist Practice. 3. Designed to prepare newly admitted advanced standing MSW students for advanced generalist practice. Covers, in depth, theoretical perspectives practice with individuals and families, ethics and values, the social work relationship, the problem-solving process, interviewing, intervention, and evaluation skills. Focus on evidence-based practice models will be addressed. *Prerequisite:* admission to the MSW advanced standing program; concurrent enrollment in SOWK 5495.

5500. Advanced Policy: Advocacy and Social Action. 3. Advanced generalist course builds on foundation and advanced year courses to prepare students to conduct comparative and advanced policy analysis and develop practice/advocacy components. Emphasis is given to policy practice issues that address economic and social justice, diversity, populations at risk, and ethics and values. *Prerequisite:* SOWK 5310 and SOWK 5115 or advanced standing.

5550. Child Welfare Services. 3. Examines issues of child and family welfare in the context of national, state, and local policy and practice. Social and economic justice are examined as they relate to interventions with children and families. Dual listed with SOWK 4550. *Prerequisite:* admission to advanced standing or SOWK 5100 and 5200.

5600. Advanced Generalist Practice. 3. Advanced applications of generalist problem-solving theories and skills in working with individuals and groups in the context of their environment. Issues of ethics, rural practice,

diversity, and evaluations of practice addressed throughout the course. *Prerequisites:* SOWK 5300 and SOWK 5310 or advanced standing.

5700. Advanced Theories and Practice with Children and Families. 3. Advanced applications of generalist problem-solving theories and skills in working with children and families in the context of their environment. Issues of ethics, rural practice, diversity, and evaluations of practice addressed throughout the course. *Prerequisites:* SOWK 5300 and SOWK 5310 or advanced standing.

5705. Social Work Leadership in Supervision and Administration. 3. Focuses on theories and skills for leadership, supervision, and administration in social work practice. Study of models and best practices, as well as skill development, will move the student toward leadership in supervision and management competence. *Prerequisites:* SOWK 5300 and SOWK 5310 or advanced standing.

5720. Advanced Generalist Practice: Community and Rural Practice. 3. Emphasizes advanced understanding and application of models of rural community practice for promotion of well-being of client systems. Rurality and diversity/difference will be highlighted in this course. Models taught are appropriate to the social work profession, based on ethical considerations, cultural competency, and the strengths perspective. *Prerequisite:* SOWK 5310 or advanced standing.

5750. Applied Research: Practice Evaluation. 3. This research-informed practice course focuses on the theory and use of small system design and program evaluation to evaluate one's social work practice. *Prerequisite:* SOWK 5400.

5755. Practice Evaluation. 1-12 (Max. 12). Complete a non-thesis Plan B practice evaluation paper of quality, working with a committee structure. Must complete a minimum of two credit hours of 5755. *Prerequisite:* SOWK 5750; or advanced standing status and SOWK 5495.

5795. Rural Health Care Seminar. 3. Examines social work and rural health and medical care for individuals, families and larger systems through policy, practice, and research. Includes a focus on the health and health care of older adults. *Prerequisites:* consent of instructor, graduate standing, participation in WYO HealthCARE Inter-disciplinary rural training grant.

5800. Advanced Seminar in Social Work. 1-3 (Max. 15). Consideration of special topics of current interest in social work. May be repeated for a maximum of 15 hours when the topic of the seminar is different. *Prerequisite:* graduate standing and consent of instructor.

5810. Working with Children and Families in the Schools. 3. Enhances knowledge, skills, and values of the generalist social worker serving children of diverse backgrounds and their families in the school and its environment, preparing the social worker for a leadership role in a rural school setting. *Prerequisite:* graduate standing.

5820. School Social Work. 1. Builds on the skills developed in SOWK 5810, advancing the knowledge, values and skills necessary for school social work. Students integrate observations of school social work settings with theory and practice, and personal evaluation, within this seminar. Public school law and policy are highlighted. *Prerequisite:* successful completion of SOWK 5810.

5850. Advanced Field Practicum. 5-10 (Max. 10). Provides advanced generalist social work practice experience in a community human service organization. Emphasizes core competencies and advanced generalist practice behaviors in social work ethics, values, theory, skills, practice and research in relation to social work with individuals, groups, families, organizations, and communities. *Prerequisites:* SOWK 5460 or Advanced Standing.

5855. MSW Advanced Field Seminar I. 1. Supports the advanced year MSW student's experience in the field practicum. This course is taken concurrently with SOWK 5850. *Prerequisite:* taken concurrently with SOWK 5850.

5856. MSW Advanced Field Seminar II. 1-8 (Max. 8). Supports the advanced year MSW student's experience in the field practicum. To be taken concurrently with SOWK 5850, spring semester. *Prerequisite:* SOWK 5855; concurrent with SOWK 5850.

5881. International Social Welfare and Social Development. 3. Examines the basic framework of social welfare analysis and social development programming in the international arena, employing a multinational comparative analysis approach to explore the wide array of responses to social need across the globe. Students employ multinational comparative analyses to an area of social concern. Dual listed with SOWK 4881; cross listed with INST 5881. *Prerequisite:* POLS 1000; ECON 1010 recommended.

5887. American Indian Health. 3. Studies the impact of federal policy on development of American Indian Health programs and the current status of American Indian health. *Prerequisite:* admission into graduate program.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5960. Thesis Research. 1-12 (Max. 24). Scholarly research that contributes to the social work profession and applied social science fields. Student designs and carries out original research under the supervision of a social work faculty member. Thesis research is done as an individual research project. *Prerequisite:* enrollment in a graduate degree program.

5975. Independent Study. 1-3 (Max. 3). In-depth exploration of a social work topic in consultation with a social work faculty member. *Prerequisite:* consent of instructor.

Wyoming Institute for Disabilities (WIND)

147 Health Sciences Building,
(307) 766-2761

FAX: (307) 766-2763

Web site: www.uwyo.edu/wind

Executive Director: Sandra Root-Elledge, M.A.

Associate Professor:

MICHELLE JARMAN, B.A. University of California at Berkeley 1989; M.A. Northern Michigan University 2000; Ph.D. University of Illinois at Chicago 2006; Associate Professor of Disability Studies 2014, 2007.

Research Faculty:

ERIC J. MOODY, B.S. Pacific Lutheran University 1998; M.A. University of Denver 2004; Ph.D. 2007; Postdoc University of Colorado School of Medicine 2011; Research Professor, Director of Research and Evaluation 2018.

Associate Lecturers:

CANYON HARDESTY, B.S. University of Wyoming 2004; M.S. 2007; M.S. Creighton University 2011; Associate Lecturer 2018, 2013.

SANDRA ROOT-ELLEDDGE, B.S. University of Wyoming 2001; M.A. 2003; Associate Lecturer 2009, 2004.

Assistant Lecturers:

ETHAN DAHL, B.A. Minnesota State University Moorhead 2012; M.A. Ball State University 2014; Ph.D. Texas Tech University 2018; Assistant Lecturer 2018.

ALISON QUAGGIN HARKIN, B.A. University of Toronto 1981; M.A. Athabasca University 2010; Assistant Lecturer 2014.

TERRI WOFFORD, B.S. University of Central Florida 1994; M.S. East Tennessee State University 1998; Assistant Lecturer 2017.

The Wyoming Institute for Disabilities (WIND) is part of a national network of University Centers of Excellence in Developmental Disabilities Education, Research and Service (UCEDD). These centers provide a broad array of interdisciplinary academic, clinical, and research experiences of people with disabilities—particularly developmental disabilities. A wide variety of disciplines contribute to the study of disabilities.

WIND offers a Disability Studies Minor which investigates broad questions about the nature, meanings, and consequences of disability from interrelated social, historical, cultural, and political perspectives. The undergraduate minor in disability studies examines disability issues from multiple lenses, and draws specifically from social sciences, humanities, and health sciences.

Disability studies has an ethical commitment to place the interests and voices of people with disabilities at the center of our curricula and training activities. The minor balances theoretical exploration with practical application, and provides students with a vibrant understanding of disability history, cultural representation, policy concerns, and current debates. Ultimately, students in the minor will work closely with people with disabilities, and gain the skills and perspectives to participate in unique disability research and advocacy.

Disability Studies Minor Requirements:

18 credit hours total

All students in the minor are required to complete three WIND core courses, one WIND elective, and two additional electives related to disability issues. Electives should be selected in consultation with a disability studies faculty advisor.

Required Core Courses: 9 credits

- WIND 2100 Introduction to Disability Studies
- WIND 4020 Disability Studies Theory & Practice
- WIND 4500 Disability Studies Practicum

WIND Elective: 3 credits selected from other WIND offerings

- WIND 2700 Gender and Disability
- WIND 2500 Topics in Disability Studies
- WIND 3150 Literature and Medicine
- WIND 4050 Independent Study
- WIND 4100 Global Disability Studies
- WIND 4200 Diverse Minds

WIND 4990 Topics in Disability Studies

Additional Electives: 6 credits selected from WIND or other UW courses related to disability studies

As an interdisciplinary field investigating disability as human diversity, this program complements majors across the university. For more information, visit the website: www.uwyo.edu/wind/disabilitystudies/index.html, contact faculty director, Michelle Jarman at mjarman@uwyo.edu or by phone at 766-5060, or visit the WIND office located in the Health Sciences Building, room 147.

Disability Studies Program Goals:

These goals are conceptualized as the ultimate “ends” we hope to achieve in educating students and trainees in disability studies.

1. Promote full social integration by providing knowledge, awareness, and experience of inclusion and integration of people with disabilities as a foundational ethical principle of disability studies.
2. Position disability as a social justice issue by exposing students to historical and contemporary disability issues and providing learning opportunities to identify, articulate, and address inequities and injustices affecting the lives of people with disabilities.
3. Position disability as diversity by providing theoretical and practical contexts for thinking about disability as a component of human diversity, and providing students with tools to critically examine social and cultural constructions of disability.

Wyoming Institute for Disabilities (WIND)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

2100. Introduction to Disability Studies. 3. [CH,D◀▶H] Provides students with an overview of the disability studies field. Students gain introductory knowledge about the disability studies perspective by examining the work of scholars from many academic backgrounds, which will facilitate students’ understanding of the interdisciplinary nature of disability studies.

2500. Topics in _____. 1-3 (max. 6). Provides students with the opportunity to gain introductory knowledge by examining various topics in the field of Disability Studies. *Prerequisite:* Consent of instructor.

2700. Gender and Disability. 3. [D◀▶H] Disability studies draws upon critical theory to investigate disability as a discursive construction. Investigates how intersecting conceptions of disability and gender have shaped cultural meanings and the social positioning of specific groups, especially women with disabilities. Topics include non-normative embodiment, issues of representation and subjectivity, and the politics of health, sexuality, and care. Cross listed with WMST 2700.

3150. Literature and Medicine. 3. This course explores how literature and memoirs have grappled with illness, disease, and disability, paying particular attention to the perspectives of doctors, nurses, patients, families, and communities in shaping meanings of diagnoses, health, and access to care. *Prerequisite:* Completion of COM1.

4020. Disability Studies Theory and Practice. 3. [CS◀▶COM3] Explores the interdisciplinary nature of disability studies theory and scholarship, including investigation of embodied knowledge, cultural meanings, and socio-political practices related to disability. Students will develop in-depth critical disability research papers and deliver accessible, professional presentations. Dual listed with WIND 5020; cross listed with SOWK 4020. *Prerequisite:* WIND 2100 or WB or COM2.

4050. Independent Study. 1-3 (Max. 6). Offers the advanced student the opportunity to pursue a topic of interest with the direction of an instructor in disability studies. Dual listed with WIND 5050. *Prerequisite:* WB and consent of instructor.

4100. Global Disability Studies. 3. [none]◀▶COM3] The course investigates global approaches to disability, including the UN Convention on the Rights of Persons with Disabilities (CRPD), and crucial disability issues such as education, employment, poverty and social integration. Students will carry out research projects and present on their work. *Prerequisite:* WIND 2100 or WIND 4020 or consent of instructor.

4200. Diverse Minds. 3. [none]◀▶COM3] Through investigations of novels, memoirs, films, and media representations of intellectual disability, autism/neurodiversity, and psychiatric disability, students critically analyze figurations of “unstable,” “unruly,” or what we will conceptualize as “diverse” minds. Dual listed with WIND 5200. *Prerequisite:* WIND 2100 or consent of instructor.

4500. Practicum. 3. Provides students practical experience in the field of Disability. Typically taken during a student's final semester in the Disability Studies Minor. *Prerequisites:* completion of WIND 2100, and WIND elective, WIND 4020 (or concurrent enrollment).

4990. Topics in _____ 1-3 (max. 12). Provides upper division/graduate students with the opportunity for critical analysis and in-depth examination of various topics in the field of Disability Studies. *Prerequisite:* consent of instructor.

5020. Disability Studies Theory and Practice. 3. Explores the interdisciplinary nature of disability studies theory and scholarship, including investigation of embodied knowledge, cultural meanings, and socio-political practices related to disability. Students will develop in-depth critical disability research papers and deliver accessible, professional presentations. Dual listed with WIND 4020; cross listed with SOWK 5020. *Prerequisite:* WIND 2100 or WB or COM2.

5050. Independent Study. 1-3 (Max. 6). Offers the advanced student the opportunity to pursue a topic of interest with the direction of an instructor in disability studies. Dual listed with WIND 4050. *Prerequisite:* WB and consent of instructor.

5100. Topics In: _____ 1-3 (Max. 12). Provides graduate students with the opportunity for critical analysis and in-depth examination of various topics in the field of Disability Studies. *Prerequisites:* upper division/graduate standing.

5200. Diverse Minds. 3. Through investigations of novels, memoirs, films, and media representations of intellectual disability, autism/neurodiversity, and psychiatric disability, students critically analyze figurations of "unstable," "unruly," or what we will conceptualize as "diverse" minds. Dual listed with WIND 4200. *Prerequisite:* consent of instructor.

Interdisciplinary Programs

Biomedical Sciences Ph.D. Program

Health Sciences 484

Web site: <http://www.uwyo.edu/biomedphd/>

Program Director: Sreejayan Nair, Ph.D.

Degree Offered

Ph.D. in Biomedical Sciences

Biomedical sciences is the study of human biological processes; the complex interactions between physiological, genetic and environmental factors that influence disease and health. It spans the spectrum from fundamental discovery to innovation and application.

Areas of focus may include but not limited to cardiac health, nutrition, reproductive biology, toxicology, diagnostic & imaging and medical engineering.

The PhD program in biomedical sciences is designed to position graduates for long-term competitive success in the rapidly changing and multifaceted health-related arena in the 21st century. It is a comprehensive, interdisciplinary program, making connections between various disciplines to gain new insights, discover and apply new knowledge, and promote self-directed, life-long learning.

Biomedical Sciences is a research & discovery focused program balancing depth and breadth of content knowledge with "enabling" skills including problem solving, innovation, entrepreneurship, communication and leadership.

Program of Study

Rationale: The program of study is designed according to student learning goals and research opportunities. It blends depth and breadth of preparation by providing broad core requirements with electives promoting specialization in a "parent" discipline. This is recognized on program documentation by a Doctorate in Biomedical Sciences/"specialization" area. For example, Doctorate in Biomedical Sciences/Reproductive Biology.

Student Learning Outcomes: The BMS program provides unique array of formal courses and informal discovery experiences focused on ensuring aptitudes, behaviors and skills necessary for leadership and competitive success in the biomedical science arena.

Although the foundation enabling innovative, independent thinking and knowledge discovery is deep discipline knowledge, the BMS program is also designed to promote student competency in information assessment, synthesis and integration, communication and translation to the broader community, teamwork, leadership and project management.

The BMS program trains graduates to be competent, skilled experimentalists, problem solvers, critical and independent thinkers, expert in their field, with both depth and breadth of knowledge.

In addition, the program aims to instill characteristics that are essential to long-term professional success, preparing scientists who are effective and dedicated mentors and teachers, organized administrators, exemplars of high ethical standards, and effective collaborators. Upon completion of the program, graduates will demonstrate:

- Independent, critical thinking skills
- Ability to identify appropriate biographical resources
- Knowledge of recent advances in discipline and related areas
- Understanding of a broad spectrum of research methodologies and their applications
- Ability to critically analyze research findings
- Ability to design and independently execute research
- Ability to use appropriate information technology to record, manage, and disseminate information
- Understanding of issues related to researcher and subject rights
- Motivation and aptitude needed to acquire knowledge
- Communication skills that are appropriate for a range of audiences and purposes
- Ability to construct and articulate arguments to a wide range of audiences
- Ability to effectively support the acquisition of knowledge by others when teaching or mentoring students
- Willingness to assume responsibility for their work
- Ability to design and teach undergraduate or graduate courses
- Ability to publish single/first authored papers in peer-reviewed journals

Biomedical Sciences (BMS)

5880. Biomedical Sciences Research Ethics. 2. Introduction to the field of bioethics, including major ethical theories and principles, with an emphasis on understanding the ethical issues that may arise while conducting biomedical research and potential strategies for properly addressing these ethical issues.

5920. Continuing Registration: On Campus, 1-12 (Max. 24). *Prerequisite:* graduate standing.

5940. Continuing Registration: Off Campus, 1-24 (Max. 24). *Prerequisite:* graduate standing.

5960. Thesis Research, 1-24 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5980. Dissertation Research, 1-24 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5985. Seminar. 1 (Max. 3). A series of weekly seminars presented by faculty from other universities, private or public sector health industries or by Biomedical Science Program faculty and students. Examines current topics and research in biomedical sciences through oral presentations and discussion. *Prerequisites:* graduate standing and consent of instructor.

Program in Ecology

Berry Center 231

Phone: (307) 766-6240

E-mail: ecology@uwyo.edu

Web site: www.uwyo.edu/pie

Program Director: Melanie Murphy

Degree Offered

Ph.D. in Ecology

The Program in Ecology prepares doctoral students to lead the discipline of ecology during the coming decades. The program is grounded in the natural history of organisms in their environment, but incorporates tools and perspectives from across the biological, physical, mathematical, computational, and earth sciences. Students develop conceptual, historical, and philosophical perspectives spanning the entire range of subdisciplines in ecology, while receiving advanced training in the subdiscipline of their individual interest.

The program fosters long-term career development by exploring the linkages of ecology with other disciplines, and by scanning the ecological horizon for emerging questions, concepts, and approaches that will shape the field in years to come.

Faculty members from several departments and colleges participate in the Program in Ecology. Their interests span the full range of topics covered in the field of ecology, and students in the program reflect this diversity.

Program Specific Admission Requirements

Only students seeking a doctoral degree will be admitted into the program. Minimum criteria for admission to the Program in Ecology are:

- Minimum undergraduate GPA of 3.000
- Agreement by a member of the PiE faculty to sponsor the student, or to co-sponsor the student together with a PiE affiliate
- Admission to a home department at the University of Wyoming

All applications to the program will be reviewed by the Graduate Affairs Committee, which has authority on admissions. Students applying to the program who lack a master's degree must show exceptional promise and commitment (e.g., through undergraduate or post-graduate research experiences, peer-reviewed publications, and/or success in competing for research fellowships). Such students are encouraged to consult with their prospective adviser on whether to apply directly to PiE or to master's programs in individual home departments of PiE faculty.

Students already admitted to doctoral programs in individual departments at the University of Wyoming may apply to transfer to the program. Transfer is not pro forma. Transfer applications are subject to the same criteria as for entering students, and admission to the program for transfer students must be approved by the Graduate Affairs Committee.

Program Specific Degree Requirements Advisory Committee

Before the end of the second semester of study, the student should nominate a five-member advisory committee to the Office of the Registrar. At least three members of the committee, including the committee chair (usually the student's adviser), will be members of the PiE faculty. One other member, who will serve as Graduate Faculty representative,

must be from outside the home department of the major adviser, although (s)he can be a faculty member in a department that participates in the program. The committee will advise the student on his/her program of graduate study, execute and evaluate the student's preliminary examination, evaluate the student's dissertation proposal and dissertation, and conduct the student's dissertation defense.

Program of Study

All students are required to take ECOL 5100 or equivalent. This course should be taken during the first year of residency. Exceptions or substitutions of these requirements are subject to approval by the graduate affairs committee.

The program of study must include at least 6 credit hours aimed at developing a tool skill, which except for rare cases shall be in the quantitative/analytical domain (e.g., statistics, modeling, GIS, remote sensing, bioinformatics). Courses relating to research tools should be taken early in the student's residency to ensure that they can be used in thesis research and advanced studies. Specific coursework and tool-skill development for the student's program of study will be developed in consultation with and subject to approval by the student's advisory committee.

Admission to Candidacy

Admission to candidacy for the Ph.D. requires two steps: 1) providing evidence that the student is prepared to identify a research question, design an approach for investigating that question, and a plan for executing the approach, all in the format of an NSF-style research proposal, and 2) illustrating adequate proficiency in the subject matter of ecology through a process involving both written and oral exams.

Proposal

Students must submit a NSF-style proposal to their committee outlining their project, typically by the end of the fourth semester. Each committee member will provide feedback to the student on the proposed research and indicate approval of the proposal or request revision. The proposal must be approved by all committee members prior to starting the preliminary exams.

While this proposal should be a plan for actual dissertation research, unforeseen circumstances may require altering the student's dissertation work after the proposal has been approved by the committee. In the case of

a major alteration, the student should reformulate a research plan and submit it to the committee in writing for committee approval.

Preliminary Exam

Passing the preliminary exam is the official admission to candidacy.

Written portion of the preliminary exam. The student will take the written exam portion of the preliminary exam no fewer than two weeks following approval of the research proposal. The goal of this exam is to test breadth of knowledge in ecology. The design of this exam will be coordinated by the graduate committee under the leadership of the adviser. Each written exam will cover the following topics:

- Ecological topics ranging from organismal/evolutionary to ecosystem-level perspectives, integrating concepts and perspectives from across the discipline, over a wide range of spatial and temporal scales.
- The philosophical and historical development of ecology.
- The conceptual background of the student's area of specialization.

The exam will consist of four to six questions developed collectively by the committee and organized by the student's major professor. The exam will be open book; however, the answers will be solely the work of the student. Answers should be fully cited and collectively should be no longer than 30 pages double-spaced exclusive of references cited. Students will have one full week (seven days) to complete the exam. Committee members will indicate pass/fail within one week following completion of written exams. Four of five passing votes are required.

Oral Portion of the Preliminary Exam. No sooner than two weeks after successfully passing the written exam, the student may proceed to an oral exam administered by his/her graduate committee. Oral exams center around three goals from which questions will be derived:

- To verify that the student is prepared, conceptually and methodologically, to carry out successful dissertation research.
- To evaluate the student's ability to conceptualize specific questions in a broad, integrative context.
- To evaluate the student's ability to think spontaneously and creatively and to articulate responses about unexpected or novel questions.

The advisory committee will discuss and organize specific questions based on these goals in a short session at the beginning of the exam period before admitting the student to the examination room and starting the exam. Following the exam each committee member will provide non-binding paper votes of pass/fail for each of the three goals of the oral exam. Following discussion of the student's performance, committee members will each assign a grade of pass/fail for the overall exam. Four of five committee members must vote for passing the overall oral exam.

Students whose performance is unsatisfactory will be given one opportunity for retaking the oral examination. This retake will occur no later than the academic-year semester following the first examination.

Public Seminars

Students are required to give two oral presentations on their research. The purposes of these presentations are to provide the student with practice in oral presentations and to keep the PiE community informed of the student's progress. The first will describe the student's dissertation research proposal. This presentation will be given before the student submits his/her thesis proposal. The second presentation will summarize the student's completed dissertation research, and will normally be given the same semester as the student's dissertation defense. Under extraordinary circumstances (subject to approval by the Graduate Affairs Committee), this presentation may be given at an earlier time. These presentations must be open to the public, and may comprise part of a departmental or Program in Ecology seminar or brown-bag series.

Ecology (ECOL)

5050. Techniques in Environmental Data Management. 4. Centers on the role of information technology in support of scientific research. Through integration of multiple software packages (e.g. Relational databases, ProgramR and ArcGIS), proven database designs, and SQL scripting, increased efficiency and utility will occur during data analyses. These information science principles are demonstrated using project-based examples. Cross listed with ENR/GEOG 5050. Prerequisite: graduate standing.

5060. Fundamental Concepts in Evolution. 3. Explores fundamental concepts in evolutionary biology including evolutionary ecology, population genetics, and speciation with an emphasis on both theoretical frameworks and practical applications. Discussion

included. Cross listed with BOT/ZOOL 5060.

Prerequisite: graduate student in good standing. (Offered every other year)

5100. Ecology as a Discipline. 3. Covers the range of ecological questions, processes, scales, and research approaches, in context of the history and philosophy of science in general and of ecology in particular. Aimed at first-year students in the doctoral program in Ecology, although students in other graduate programs are welcome. *Prerequisite:* graduate standing.

5400. Community Ecology. 3. Community ecology is the study of interactions within and among groups of species. This course focuses on (1) the major classical concepts and theories in community ecology, (2) the ways in which population dynamics can impact communities and how community dynamics can impact ecosystem processes and functioning, and (3) implementation of quantitative methods for conducting research that includes community ecology. Cross listed with REWM 5400. *Prerequisite:* LIFE 3410 or equivalent.

5500. Quantitative Analysis of Field Data. 3. A practical guide to the analysis of messy field data, including data exploration, generalized linear and additive models, mixed models, autocorrelation, and model selection using Program R. Students will spend one intensive week learning methods and the rest of the semester analyzing their own data and writing a manuscript. *Prerequisite:* graduate standing.

5540. Microbial Diversity and Ecology. 4. Introduces the diversity and ecology of soil microbes through an integrated lecture and laboratory course. Emphasis on molecular approaches to analyzing microbial diversity and evolution, and student-directed experimental design. Provides a continuum of realistic research experiences in molecular microbial ecology, from field work to evolutionary analysis of DNA sequence data. Cross listed with MOLB/MICR/SOIL 4540. Dual listed with MOLB/SOIL 5540. *Prerequisites:* MOLB 2210.

5550. Ecology as a Scientific Profession. 2. A capstone that prepares doctoral students for success and leadership in their careers as professional ecologists. Intended for students enrolled in the doctoral Program in Ecology in their final year. *Prerequisite:* graduate standing.

5580. Rangeland Restoration Ecology. 3. Detailed analysis of various ecosystems unique to western rangelands. Primary emphasis on plant community restoration following degradation from edaphic, biotic, hydrologic, and topographic factors. Application of ecological principles to rehabilitate vegetation and restore ecosystem function. Strong emphasis on current research to formulate restoration strategies. Cross listed with REWM 5580.

5610. Quantitative Modeling in Landscape Ecology. 3. Emphasis on quantitative, spatial analysis of landscapes and application of these quantitative tools to making sound management decisions. Work with real data, acquire high-level quantitative skills, develop problem-solving skills, and discuss management application of model results. Analysis will encompass abiotic, biotic (plant and animal), and human use of ecological systems in a spatial context. Cross listed with REWM 5610. *Prerequisites:* upper division stats course (e.g., STAT 4015 or STAT 4025) and graduate standing. (Offered during even-year fall semesters)

5620. Advanced Topics in Ecology. 1-4. (Max. 12). Provides advanced treatment of specific topics in ecology that are not covered in regular courses. *Prerequisites:* graduate standing and consent of instructor.

5650. Tropical Field Ecology Ecuador. 4. Course comprises 10 days in Ecuador in January (before spring semester), followed by one lecture per week during spring semester. Focus will be ecology, biodiversity and conservation of tropical forests and behavioral ecology of birds and mammals. Field site is at 1100m on west slope of the Andes. Cross listed with ECOL 5650. *Prerequisite:* graduate standing.

5680. Landscape Genetics. 3-4. Provides a unique opportunity for interdisciplinary training and international collaboration uniting some of the most active landscape genetics groups in North America and Europe. A key objective of landscape genetics is to study how landscape modification and habitat fragmentation affect organism dispersal and gene flow across the landscape. Meeting this and other landscape genetic objectives requires highly interdisciplinary specialized skills making intensive use of technical population genetic skills and spatial analysis tools (spatial statistics, GIS tools and remote sensing). To bring these diverse topics and skills together effectively, we are using a distributed model of teaching. Population genetics, spatial analysis/statistics, and previous experience in Rare all extremely useful but not required. Cross listed with: REWM 5680.

5775. Forest Ecology. 4. Integrative study of the structure, function, and ecological diversity of forested ecosystems, and the physical factors that influence this diversity, including emergent properties of energy flow and nutrient cycling. Special emphasis is given to understanding forest disturbances and succession, and implications for impacts of management and sustainability are discussed throughout. Cross listed with RNEW 5775 and BOT 5775. *Prerequisite:* LIFE 3400. (Offered during even-year fall semesters)

5780. Research in Ecology. 1-6 (Max. 12). Designed for doctoral students pursuing exploratory research before they have determined a dissertation project, and for students to pursue independent research that will not comprise part of their dissertation. Research must be conducted under supervision of an Ecology Faculty member or Affiliate. *Prerequisite:* admission to doctoral Program in Ecology.

5920. Continuing Registration: On Campus, 1-2 (Max. 16). *Prerequisite:* graduate standing.

5940. Continuing Registration: Off Campus, 1-12 (Max. 16). *Prerequisite:* graduate standing.

5980. Dissertation Research. 1-12 (Max. 48). Designed for students who are involved in research for their dissertation project. Also used for students whose coursework is complete and are writing their dissertation. *Prerequisite:* enrollment in a graduate level degree program.

Food Science and Human Nutrition

Phone: (307) 766-2224 or (307) 766-4145
Web Address: www.uwyo.edu/anisci or www.uwyo.edu/fcs

Degree Offered

M.S. in Food Science and Human Nutrition

The interdisciplinary food science and human nutrition master's degree program, jointly sponsored by the departments of Animal Science and Family and Consumer Sciences, affords students the opportunity to pursue graduate work in the areas of human nutrition and/or food science. Prior to admission to the program, students will select the major department (Animal Science or Family and Consumer Sciences) that best suits their desired research area(s) and indicate which faculty member from that department they would prefer as a mentor. Students choosing the interdisciplinary program in food science and human nutrition will gain expertise in theory as well as research in some combination of the areas of food microbiology, meat science and food chemistry, human nutrition and metabolism, food product development, and community nutrition. All students will be exposed to laboratory as well as classroom learning experiences.

Program Specific Admission Requirements

Recommended prerequisites for students entering the program:

One semester of organic chemistry (may include laboratory)

Human or animal anatomy and physiology

Introductory statistics

Program Specific Degree Requirements

One semester of biochemistry (may include laboratory)

Human or animal anatomy and physiology
Statistics

A minimum of 30 credit hours is required for this degree. Students may be required to take more than the minimum number of credit hours, either because they have to satisfy prerequisites for some of their graduate-level courses, or because a student's committee determines that more than 30 hours will be needed for the student to reach his/her professional objective. The student's program of study must include at least one credit hour of graduate-level seminar. A thesis is required. Students may request their area of thesis research be in food science or in human nutrition.

Students may use facilities such as the meat processing laboratory, sensory evaluation rooms, experimental kitchens, and a variety of modern facilities for research involving small animals and human subjects. Laboratory instruments including high performance liquid chromatographs, electrophoresis equipment, densitometers, gas chromatographs, ultracentrifuges, scintillation counters, differential scanning calorimeters, and histological equipment as well as computers are also available.

See the Food Science (FDSC) and Family and Consumer Sciences (FCSC) section of this catalog for course listings.

Molecular and Cellular Life Sciences

203 Animal Science/Molecular Biology Complex

Phone: (307) 766-3300

E-mail: mcls@uwyo.edu

Web Address: www.uwyo.edu/mcls

Program Director: Jesse Gatlin, Ph.D.

Admissions Director: Dan Levy, Ph.D.

Degree Offered

Ph.D. in Molecular and Cellular Life Sciences

This interdisciplinary program with more than 30 faculty participants spans a wide range of research topics, such as:

Biotechnology, bioengineering, biomaterials, and pharmacology
Cell biology and signaling
Genetics and development
Genomics, proteomics, and computational biology
Microbiology and infectious disease
Structural biology and biophysics

Coursework focuses on core courses in biochemistry and molecular biology, with electives that include such diverse courses as:

Topics in Genomics
Biophysics
Microbial Physiology and Metabolism
Cell and Developmental Genetics
Mass Spectrometry and Analytical Chemistry
Biomedical Engineering
Mammalian Endocrinology
Cell Culture and Virology
Introduction to Bioinformatics
Protein Structure and Function
Microbial Genetics
Computational Biology
Quantitative Microscopy

Program Specific Admission Requirements

Admission to MCLS is a two-step process. The first level of evaluation is carried out by the MCLS admissions committee. This step does not require any fee but does require that all requested materials be submitted as described on our website. After an initial review of all complete applications, a subset of qualified applicants will be selected for video conference interviews with members of the MCLS admissions committee. Applicants who are chosen for admission to the MCLS program will then complete the final application step through the University of Wyoming Admissions office. This latter step requires the completion of several additional forms. Students are then officially notified by the university of their acceptance into the MCLS program.

We encourage students to submit their completed applications at the very latest by January 15 of each calendar year. However, because our review of applications will begin in the late fall, early submissions are encouraged and may stand a greater likelihood of success. Also note that we will continue to review new applications received after January 15 in the event that additional slots are available.

Program Specific Degree Requirements

MCLS doctoral students must fulfill the minimum requirements outlined by the university. In addition, students must obtain a high level of proficiency in the core foundations of the molecular and cellular life sciences through required courses in biochemistry/molecular biology, scientific literature analysis proficiency, and the MCLS cornerstone course. Because of the broad range of research interests pursued by MCLS faculty and students, considerable flexibility will be exercised regarding the specific nature of the graduate-level elective courses that students may take.

Students must successfully complete four eight-week rotations in MCLS laboratories of their choice during the first year.

Students must pass a comprehensive assessment exam at the end of the first year. Towards the end of the second year, students will undertake a qualifying examination in order to be formally admitted to graduate degree candidacy. This exam will have both written and oral components and will cover areas of science that are relevant to the students' research.

The research and coursework progress of MCLS students will also be monitored and evaluated every year by the MCLS curriculum committee. In addition, an annual meeting with a research-specific dissertation committee will facilitate and evaluate the research progress of MCLS students beginning in the second year.

Students must attend weekly outside seminars on topics in the molecular life sciences for the durations of their studies.

For more information, please see the program's Web site at: www.uwo.edu/MCLS/.

Natural Science (NASC)

4790. Topics in Natural Science. 1-6 (Max. 10). Presents selected science topics to acquaint teachers or prospective teachers with new concepts, materials or techniques, as introduced in various new school curricula. Topics may include earth science for the middle school, computer learning and/or elementary school environmental science. Includes laboratory. *Prerequisite:* junior standing.

4800. Field Studies in Natural Science. 1-6 (Max. 10). Explores topics best studied in the field, on location, or otherwise outside the traditional classroom. Topics may include

grassland ecosystem, geology field trips for elementary children and/or schoolyard study areas. Includes laboratory. *Prerequisite:* junior standing.

5110. Physical Science in Global Context, MSC. 3. One in a series of three courses investigating earth as a system. Examines the global dynamics of energy, hydrocarbon combustion, and the physics and chemistry of water. Investigates relationships between energy transformations and pollutants. Considers environmental limitations of fresh water availability and the buffering effect of sea and fresh water. *Prerequisite:* graduate standing and teaching certification in elementary, middle school or general science; or, graduate standing and concurrent enrollment in a program leading to teacher certification in Elementary, middle school or general science education.

5120. Earth Science in Global Context, MSC. 3. One in a series of three courses investigating earth as a system. Emphasizes the lithosphere and atmosphere and their interactions with the hydrosphere and biosphere. Examines the interplay between tectonic processes, earth's radiation balance, ocean processes, ozone depletion and the greenhouse effect. Includes evaluation of methods of measuring and monitoring these phenomena. *Prerequisite:* graduate standing and teaching certification in elementary, middle school or general science; or, graduate standing and concurrent enrollment in a program leading to teach certification in elementary, middle school or general science education.

5130. Life Science in Global Context, MSC. 3. One in a series of three courses investigating earth as a system. Investigates ecosystem composition and processes, and biological responses to changes in ecosystem parameters. Examines terrestrial and aquatic communities, photosynthesis, energy flow, biogeochemical cycles, global climate change, climate warming, deforestation, population ecology, DNA/RNA structure, function, genetic engineering and forensic applications. *Prerequisite:* graduate standing and teaching certification in elementary, middle school or general science education.

5140. Numbers, Operations, and Patterns for the Middle-Level Learner, MMA. 3. Provides working middle-level mathematics teachers opportunities to understand and discuss numbers, their representations, and operations on them, from an abstract perspective that includes elegant proof. Also emphasized is the role of language and purpose in composing definitions. Cross listed with MATH 5140. *Prerequisite:* admission to a UW graduate

program, either degree or non-degree seeking status, and acceptance into the Middle-level mathematics program.

5160. Social and Historical Issues in Mathematics and the Middle-Level Learner, MMA. 3. Empowers teachers of middle-level mathematics to design engaging experiences. Emphasizes the historical context for the development of mathematics, especially its symbols, tools, personalities, and classic problems. Cross-listed with MATH 5160. *Prerequisite:* admission to a UW graduate program, in either degree or non-degree seeking status, and acceptance into the Middle-level Mathematics program.

5170. Connecting Geometry with Problem-Solving for the Middle-Level Learner, MMA. 3. Showcases two aspects of 2D and 3D geometry: measurement and transformation. Emphasis reflects current State and National standards for middle-level mathematics classroom and teacher preparation, especially appropriate uses of technology, geometric tools, mathematical language, and problem-solving strategies. Cross listed with MATH 5170. *Prerequisite:* admission to a UW graduate program, in either degree or non-degree seeking status, acceptance into the Middle-level mathematics program.

5185. Analysis of Data in the Media for the Middle-Level Learner, MMA. 3. Focuses on data collection, analysis, interpretation, and communication, using contexts relevant to everyday situations. Topics chosen integrate well with the concerns of middle-level teachers and connect with such curriculum areas as health, science, and social studies. This is not a research methods course. Cross listed with MATH 5185. *Prerequisite:* admission to a UW graduate program, in either degree or non-degree seeking status, and acceptance into the Middle-level Mathematics program.

5190. Mathematics of Change and the Middle-Level Learner, MMA. 3. Students gain a solid understanding of data and functions in the service of calculus. Hands-on, project-driven, and focuses on the essential concepts of functions and calculus and their role in middle-level mathematics. Emphasis is on writing and technology (calculators and probeware). Cross-listed with MATH 5190. *Prerequisite:* admission to a UW graduate program, in either degree or non-degree seeking status, and acceptance into the Middle-level Mathematics program.

5205. Methods of Teaching Middle-Level Mathematics, MMA. 3. Research-based pedagogy and pedagogical content knowledge for teaching middle-level mathematics. De-

signed for practicing teachers of middle-grades mathematics. Cross-listed with EDCI 5205. Prerequisite: admission to the SMTC Program. 5215. Using Instructional Technology for Middle-Level Mathematics, MMA. 3. Covers the use of technology appropriate to middle-level mathematics teaching, such as microworlds, geographic information systems, spreadsheets, and other content appropriate technologies. Cross-listed with EDCI 5215. Prerequisite: admission to the SMTC Program.

5225. Assessment for Middle-Level Mathematics, MMA. 3. Middle-level Mathematics Initiative teacher participants examine, analyze, and implement a variety of assessments that are aligned with standards and instruction appropriate to the middle level math learner. Cross listed with EDCI 5225. Prerequisite: admission to the SMTC Program.

5300. Classroom Assessment in Middle-level Science, MSC. 2. Deals with the design, construction, and testing of curriculum materials to bring the spirit of scientific inquiry to elementary school pupils. Research to be conducted in the Science and Mathematics Teaching Center.

5400. Spatial Data Instructional Technology. 1. Teaching strategies appropriate for elementary/middle school students' conceptual level of development. Positive attitudes toward teaching children about the Earth, its physical environment and human/environment relationships will be promoted. The course content will be supported by the use of geospatial technologies, such as GPS and GIS. Prerequisite: graduate standing.

5510. Integrated Instructional Strategies, MSC. 2. Appropriate instructional strategies are discussed and modeled for aligning standards, expectations, and experiences in an integrated science environment. Attention is given to unique characteristics of each strategy, including a review of research on the effectiveness of each strategy on student achievement and attitudes. Prerequisite: graduate standing and teaching certification in elementary, middle school or general science; or graduate standing and concurrent enrollment in a program leading to teacher certification in elementary, middle school or general science education.

5600. Mathematics and Statistics in Science Teaching, MSC. 2. Provides science teachers with the knowledge and experience necessary to help students use statistics in the scientific process. Activities emphasize a hands-on inductive approach closely related to the school science curriculum. Important statistical ideas and methods are studied as they arise naturally in the biological, physical,

and earth sciences. Prerequisite: graduate standing and teaching certification in elementary, middle school or general science; or, graduate standing and concurrent enrollment in a program leading to teacher certification in elementary, middle school or general science education.

5610. Field Studies in Environmental Education, NED. 4. Expands student's knowledge of ecological and physiological animal and plant adaptations to environmental conditions, the use of teaching methods and tools of naturalists, the range of resources available for designing and evaluating curriculum, and promotes an appreciation and understanding of the diversity of environments. Contains 4 modules. Prerequisite: graduate standing; must be accepted into the Teton Science School Program and matriculating at the TSS site.

5620. Advanced Elements of Field Ecology Course Design, NED. 5 (Max. 6). Addresses designing field ecology courses that include research, outdoor leadership, and natural history components. Opportunities are provided to gain deeper understanding of key natural history and ecology concepts of the bioregion; practical strategies for teaching these concepts in field programs; and to formally present student work. Prerequisite: graduate standing; must be accepted into the Teton Science School Program and matriculating at the TSS site.

5625. Place-Based Education - Teton Science School. 3. Introduces graduate students at Teton Science Schools to the theory and practice of place-based education. The design of the course exposes students to the historical, political, and eco-social underpinnings of place-based education while supporting students in developing thoughtful place-based pedagogies. Prerequisite: graduate student status.

5630. Teaching Practicum-Teton Science School. 2-4 (Max. 6). To improve teaching methods and techniques and expand professional skills. Integrates the foundation of Teton Science Schools, applies coursework content understanding and develops leadership. The course is intended to challenge previously held instructional beliefs and nurture an evolving set of skills and instructional identity. Not equivalent to EDSE 4500 or EDCI 5990 or EDEL 4500. Prerequisite: current enrollment at Teton Science School.

5640. Introduction to Field Science Teaching. 3. Designed to introduce graduate students at Teton Science Schools' to the field of environmental education and instructional concepts for teaching environmental science in the outdoors. Learn field science content, principals of connecting to place, teaching

techniques, and learning theories related to environmental education and field science teaching. Prerequisite: current enrollment at Teton Science School.

5650. Place-Based Learning. 3. Place-based learning is explored and related to cognitive development, assessment, and education for a democracy. The focus in on science and mathematics and how to use "place" to provide meaningful learning experiences for students while making contributions to the community. Students develop a local place-based project.

5660. Standards, Pedagogy and Research. 2. This course is designed to provide Master of Science in Natural Science students with background in three areas: current science standards, pedagogical practices, and the understanding of various types of educational research as well as some of the practices related to conducting their own research projects. Prerequisite: Master of Natural Science - MMA, MSC, or NED who have completed at least one year of coursework, or permission of the instructor or SMTC program coordinator; graduate standing.

5670. Research Methodology. 4. This course provides foundational information on asking appropriate questions, researching (including IRB), writing, formatting, and defending a Plan B project. At the end of the semester students will have a committee, a preliminary draft, and present their research. Spring semester will be used to complete projects with committee members. Prerequisite: Master of Natural Science - MMA, MSC, or NED who have completed at least one year of coursework, or permission of the instructor or SMTC program coordinator; graduate standing.

5700. Seminar in Science for Secondary School Teachers. 1-6 (Max. 6). A course to give graduate students in education, or in-service teachers, an in-depth view of the new materials for teaching science in secondary schools. Prerequisite: consent of instructor.

5770. Investigation in Natural Science for Secondary Teachers. 1-5 (Max. 10). Deals with the design, construction, and testing of curricula materials to bring the spirit of scientific inquiry to secondary school students. Research to be conducted in the Science and Mathematics Teaching Center. Prerequisite: consent of instructor.

5810. ML Science & Math Practicum. 3. Practica for graduate students in the MS-Natural Science MSC and MMA programs in Middle and Junior High schools. Mathematics and science classrooms will serve as sites for assignments. Students complete assignments for the content area of certification as well as appropriate discussions. Prerequisite: Graduate

students in department who have passed at least four departmental courses or consent of the instructor.

5890. Directed Professional Study. 1-6 (Max. 6). Primarily for upper-division students who can benefit from independent study with minimal supervision. Given to allow interested students to pursue specific aspects of curriculum and instruction. Prerequisites: consent of instructor and graduate standing. 5900. Practicum in College Teaching. 1-3 (Max. 3). Work in classroom with a major professor. Expected to give some lectures and gain classroom experience. *Prerequisite:* graduate status.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5959. Enrichment Studies. 1-3 (Max. 99). Designed to provide an enrichment experience in a variety of topics. Note: credit in this course may not be included in a graduate program of study for degree purposes. S/U only. *Prerequisite:* graduate standing.

5960. Thesis Research. 1-12 (Max. 24). Designed for students who are involved in research for their thesis project. Also used for students whose coursework is complete and are writing their thesis. *Prerequisite:* enrollment in a graduate degree program.

5961. Plan B Project. 1-4 (Max. 4). Limited to those students enrolled in a Plan B graduate program. Students should be involved in non-course scholarly activities in support of their Plan B project. *Prerequisite:* must be enrolled in Plan B program and have program approval.

5990. Internship. 1-12 (Max. 24). *Prerequisite:* graduate standing.

Neuroscience

Phone: (307) 766-9953

E-mail: jfox7@uwyo.edu

Web Address: www.uwyo.edu/neuroscience

Program Director: Jonathan Fox, Ph.D.

Degree Offered

Ph.D. in Neuroscience

The Graduate Neuroscience Program offers training leading to the Ph.D. degree in Neuroscience. The Neuroscience Program emphasizes systems and integrative approaches, and our goal is to provide the students with the necessary background to be broadly

trained research neuroscientists and to carry out independent research in neuroscience. The Neuroscience Program emphasizes continuing interaction with faculty from several departments and we have a low student to faculty ratio. Advisors spend considerable time supervising and training each doctoral student. The educational philosophy of the Neuroscience Program is to encourage a problem-oriented rather than a strict discipline-bound approach to research. You will emerge from this program with the scientific and experimental training needed to comprehensively address a very wide range of research questions using a variety of techniques and analytic tools.

The Graduate Neuroscience Program is designed to enable graduate students to acquire competence in the various disciplines necessary for research and teaching careers in neuroscience. The current interests of the Neuroscience faculty include sensory neurophysiology, behavioral neuropharmacology, neurodevelopment, neurodegeneration, and synaptic plasticity.

Students and faculty have access to outstanding resources established by NIH Neuroscience and Sensory Biology Core grants. The Microscopy Core houses both light (Zeiss laser scanning, fluorescent) and electron (Transmission and Scanning) microscopes. Resources needed to conduct research ranging from molecular, cellular circuit level to behavior are readily available within the Neuroscience Center.

Doctoral Program Admission Minimum Requirements

GRE: 153 on the verbal reasoning sections and a score of at least 144 on the quantitative reasoning section is required;

GPA: 3.000 (4.000 scale);

Three favorable letters of recommendation;

Bachelor's degree in a biological science from an accredited institution;

Statement of research interests and career objectives. We recommend that students study the Neuroscience faculty web sites and contact faculty regarding openings and shared research interests.

You will be best prepared for our program if you have successfully completed courses in neuroscience, chemistry, biology, physiology, and cell/molecular biology. Students may be admitted with deficiencies in some of the areas if they are strong in many or all others.

If so, the student's advisory committee will determine what additional work is necessary during the first year to correct any deficiency.

Program Specific Degree Requirements

Doctoral Program

All doctoral Neuroscience students are required to complete a program of core coursework that includes the following required courses: Introduction to Neuroscience, Structure and Function of the Nervous System and Neurophysiology. Students are required to take one course in Statistics (e.g. STAT 5050, STAT 5210) and the course that meets this requirement will be arranged with the student's committee. The statistics requirement must be met by the end of the second year. The Neuroscience Program is a research-oriented program and students are expected to take a minimum of 2 to 3 credit hours of research per semester. Students are also expected to enroll in an on-going Seminar in Neuroscience. The Neuroscience Seminar, which meets weekly and is attended by students and faculty members, provides an opportunity for intellectual and social exchange, as well as for the development of professional skills in critical thinking. The topic for seminar and the faculty member directing the seminar changes each semester. The remainder of the coursework for the doctor of philosophy degree is selected from designated courses in Neuroscience, physiology, pharmacology, and molecular biology. A grade of B or better is required for all Neuroscience courses.

A student is expected to have a graduate adviser at all times. The faculty adviser must be a participating member of the Neuroscience faculty. The adviser is responsible for directing the student's research and academic coursework. During the second year, the student will have an advisory committee. The advisory committee will consist of at least three neuroscience faculty members and an outside member. Normally, the student's adviser will chair the committee and help identify members of the committee who best match the student's area of interest. The role of the advisory committee is to oversee all aspects of the student's education after the first year.

Students give two public research presentations 6-12 months before the preliminary and final defense exams. In the student's second or third year, the advisory committee will set and evaluate the student's qualifying examination. After successful completion of the preliminary examination the student will profess to Ph.D. candidate status.

The dissertation is the single most important component of the graduate program. It reports the results and significance of the student's research. In addition to the written dissertation, the doctoral candidate will deliver a formal seminar based on their research. The seminar will be followed by an examination by the student's advisory committee.

Neuroscience (NEUR)

4295. Neurodevelopment. 3. Through lecture and discussion of research articles, students learn mechanisms of nervous system development, from the birth and differentiation of neurons to the formation of synapses and circuits. Focus is on classical experiments done in vertebrates (*Xenopus* tadpole, chick, zebrafish, and mouse) and invertebrates (nematode and *Drosophila*). Dual listed with NEUR 5295; cross listed with ZOO 4295. *Prerequisite:* ZOO 4280.

4720. Neuroscience Speaker Seminar. 2 (Max. 6). The purpose of this course is to use the Neuroscience/sensory biology visiting speaker series to build student knowledge in neuroscience, as well as skills in critical evaluation of the research literature, and oral/written communication. This will maximize student learning from the speaker series. The course may be taken up to three times. Dual listed with NEUR 5720. *Prerequisite:* Graduate level standing in neuroscience, biomedical sciences, zoology/physiology, or other life science programs. Undergraduates: concurrent or prior ZOO 4280.

5100. Structure and Function of the Nervous System. 4. Aimed at understanding the structure and interconnections within the nervous system, and how structure gives rise to the complex functions mediated by the brain. This is an essential feature of neuroscience. Covers gross anatomy of the central and peripheral nervous system, followed by detailed consideration of the divisions of the brain and their functional significance. Cross listed with ZOO 5100. *Prerequisites:* admission to the graduate neuroscience program, or graduate standing in another related program, or permission for undergraduate enrollment following discussion with the instructor.

5280. Introduction to Neuroscience. 3. Examines the basic properties of neurons and from there identifies determinants of brain development and how neuronal circuits are formed. How neuronal circuits underlie processing sensory information, coordinated movement, complex functions (e.g. sleep,

learning) and homeostasis are discussed. Cross listed with ZOO 5280. *Prerequisite:* ZOO 3115 or equivalent.

5295. Neurodevelopment. 3. Through lecture and discussion of research articles, students learn mechanisms of nervous system development, from the birth and differentiation of neurons to the formation of synapses and circuits. Focus is on classical experiments done in vertebrates (*Xenopus* tadpole, chick, zebrafish, and mouse) and invertebrates (nematode and *Drosophila*). Dual listed with NEUR 4295; cross listed with ZOO 5295.

5685. Neurophysiology. 3. Designed to investigate the structure and function of nervous systems, drawing information from both vertebrate and invertebrate organisms. Topics such as sensory systems, motor coordination and central integrative mechanisms will be covered in addition to the basic neurophysiology of nerve cells. Cross listed with ZOO 5685. *Prerequisite:* one course in physiology, chemistry, physics.

5715. Seminar in Neuroscience. 1-2 (Max. 20). A continuing seminar. All students in the graduate neuroscience program are expected to register for this seminar each semester. The interdisciplinary approach to the nervous system is used employing work from physiology, neuroanatomy and neurochemistry, psychology, pharmacology and biochemistry. Cross listed with ZOO 5715. *Prerequisites:* admission to the graduate neuroscience program or graduate standing.

5720. Neuroscience Speaker Seminar. 2 (Max. 6). The purpose of this course is to use the Neuroscience/sensory biology visiting speaker series to build student knowledge in neuroscience, as well as skills in critical evaluation of the research literature, and oral/written communication. This will maximize student learning from the speaker series. The course may be taken up to three times. Dual listed with NEUR 4720. *Prerequisite:* Graduate level standing in neuroscience, biomedical sciences, zoology/physiology, or other life science programs. Undergraduates: concurrent or prior ZOO 4280.

5800. Research in Neuroscience. 1-16 (Max. 16). The research must be conducted under the supervision of one of the neuroscience program faculty. Laboratory opportunities for research include neuroendocrinology, behavioral neuroscience, sensory neurophysiology, neuroanatomy, neuropharmacology, neurotoxicology, neural cell biology, and neurochemistry. *Prerequisite:* admission to the graduate neuroscience program or graduate standing.

5887. Molecular Neuropharmacology. 3. Focus on the molecularly-induced functional changes within the nervous system in normal and disease states. In addition, will provide a thorough explanation of the cellular and molecular actions of drugs on synaptic transmission and discuss the neurochemical basis of behavior. *Prerequisites:* PharmD current standing and instructor's permission or NEUR 5280.

5920. Continuing Registration: On Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5940. Continuing Registration: Off Campus. 1-2 (Max. 16). *Prerequisite:* advanced degree candidacy.

5960. Thesis Research. 1-12 (Max. 24). *Prerequisite:* advanced degree candidacy.

5980. Dissertation Research. 1-12 (Max. 48). *Prerequisite:* advanced degree candidacy.

Reproductive Biology

Phone: (307) 766-6278 or 766-4378

E-mail: balex@uwyo.edu or enette@uwyo.edu

Web Address: www.uwyo.edu/reprobio

Program Directors: Brenda Alexander, Ph.D. and Enette Larson-Meyer, Ph.D., R.D.

Degrees Offered

M.S. and Ph.D. in Biomedical Science/Reproductive Biology

The University of Wyoming offers an innovative program of graduate studies in vertebrate reproductive biology under the Biomedical Science umbrella. This interdisciplinary graduate program was established in 1986 and combines the expertise of faculty members who have established records of accomplishment. Areas of emphasis include: ovarian biology, fetal/placental physiology, neuroendocrinology, nutrition/reproduction interactions, lactation, pituitary cytoarchitecture, human nutrition/exercise/reproduction, reproductive immunology, and the fetal origins of growth efficiency, reproductive function, and adult disease.

The opportunity to study in these exciting areas is made available primarily through the collaborative efforts of the faculty in the departments of Animal Science, Family and Consumer Sciences, Molecular Biology, Veterinary Science, and Zoology and Physiology, as well as the School of Pharmacy. Programs are offered leading to the M.S. degree in Reproductive Biology or Ph.D. degrees in Biomedical Sciences/Reproductive Biology. Qualified students are eligible to compete for a graduate

assistantship assigned to the program. Post-doctoral positions provide advanced training in research and teaching.

Both the research and teaching aspects of the program reflect a truly interdisciplinary approach. Research activities range from directly applied to fundamental. Animals used for investigation can include livestock and laboratory species. Modern laboratories are designed for hormonal, chemical, and molecular analysis of biological samples, light, electron and confocal microscopy, incubation of cells, tissues and small animal experimentation. Well-equipped large animal surgical and handling facilities are located at the Laramie Agriculture and Extension Center and Red Buttes Research Center. A well equipped human nutrition and exercise facility is located on campus.

Program Specific Admission Requirements

GRE composite score of 291 and 297 for M.S. and Ph.D. students, respectively.

GPA of 3.000 (with A=4.000).

TOEFL score of 540 for students whose native language is not English.

Program Specific Degree Requirements

Requirements are based on the university minimum requirements.

Science and Mathematics Teaching Center

242 Hill Hall, (307) 766 6381, smtc@uwyo.edu, <http://uwyo.edu/smtc>

The Science and Mathematics Teaching Center (SMTC) was established in 1970 and is committed to excellence in science, mathematics and technology education. As part of the Office of Graduate Education in Academic Affairs, the SMTC, in cooperation with the Wyoming Department of Education (WDE) and the Professional Teaching Standards Board (PTSB), serves as a resource and professional development center for the state. The SMTC offers transdisciplinary graduate degree programs with multiple degree concentrations, certification options, and endorsement options. All of the programs emphasize both strong content knowledge and instructional practices. The affiliate faculty for the SMTC is comprised of include faculty from the Colleges of Agriculture and Natural

Resources, Arts and Science, Education, and Engineering and Applied Science, and the Haub School of Environment and Natural Sciences.

The SMTC provides extensive off-campus professional development that serves throughout Wyoming that serves teachers, students, administrators, school districts and communities. SMTC in-service and extension courses, workshops, institutes, and conferences are designed collaboratively to improve science and mathematics teaching in Wyoming.

The SMTC administers and supports five master's degree programs:

(1) the Master of Science degrees in Natural Science with concentrations in Middle Level Math (MMA) and (2) Middle Level Science (MSC); these programs are designed for Wyoming's in-service elementary, middle, and high school teachers. They focus on general science and mathematics content with an emphasis on teaching middle school level learners. The course work leads to middle level certification provided by the Wyoming PTSB. Teachers must have two years of teaching experience to participate in these programs.

(3) Master of Science in Teaching – Natural Science (MST – Natural Science). This is a self-directed master's degree program working with the SMTC, SER, and the Haub School as well as other colleges. The program is developed individually with the guidance of a graduate committee based on the interests of the graduate student and may emphasize formal or informal learning settings.

(4) Master of Science – Natural Science (MS – Natural Science). This is a self-directed master's degree program working with the SMTC, SER, and the Haub School and other colleges. The program is developed individually based on the interests of the graduate student.

(5) Master of Science in Natural Science with a concentration in Natural Science Education (NED). This Master's degree program is designed for students pursuing careers as environmental and natural science educators in non-public school or non-formal education settings. These students spend one year at the Teton Science Schools (TSS) in Jackson. A long-standing MOU between the SMTC and TSS allows students to use 15 graduate credit hours earned at TSS towards a master's degree if they are accepted into the second year at UW within the SMTC.

Admission Requirements

For the MSC, MMA, MST and MS-Natural Science Master's Degrees:

- Two years of teaching experience and a valid teaching license
- Application Fee, unless a UW Graduate Official Transcripts from all Institutions attended and Bachelor Degree conferring institution
- 3.0 undergraduate grade point average; provisional admission with a lesser GPA only with consent from Academic Affairs
- GRE (minimum 292 score) or an Alternative Portfolio including evidence that supports the potential success of the candidate as a graduate student and a document that interprets the evidence
- Writing Sample in response to three provided questions
- Resume
- Three Letters of Recommendation including a letter from the teacher's principal and two other colleagues.
- Note: if a prior Master's degree has been awarded, GRE Scores or an Alternative Portfolio are not required

The NED Degree – First Year Application:
 Official Transcripts from all institutions attended and Bachelor Degree conferring institution
 Application Fee, unless a UW Graduate

The NED Degree – Second Year Application:
 GRE (minimum 292 score) or an Alternative Portfolio including evidence that supports the potential success of the candidate as a graduate student and a document that interprets the evidence
 Writing Sample in response to three provided questions
 Resume
 Three Letters of Recommendation including a letter from a TSS Graduate Program Faculty Member, one from another TSS employee such as a Classroom Instructor or Field Instructor, and one from the first year application.

All the above information needs to be uploaded onto a UW graduate application, which will be reviewed by the SMTC and then if accepted, by the University of Wyoming Admissions and the SMTC. Any of the above requirements plus the university's minimum 3.000 grade point average can be waived if the

proper documentation and reasoning is given and approved by the Associate Vice President of the Graduate Program.

Degree Requirements

For the MSC, MMA, MST and MS- Natural Science Master Degrees

Plan B (non-thesis)

30 Credit Hours of coursework is required. This includes 24 credit hours in required coursework that includes mathematical content courses, mathematical history, pedagogy and assessment; earth science, life science, physical science, depending on the program. 6 credit hours of additional coursework that can include a research class and an elective.

The MSC is a 3-year program, for the required coursework, in the summers only on UW's main campus.

The MMA is a 2-year program with classes offered virtually in the fall and spring and in-person on the main campus in the summer, for the required courses.

The MST and the MS- Natural Science Master Degrees are Main campus degrees.

A Plan A (thesis) may be completed with an extra year of research.

For the NED Master Degree – 2nd year.

Plan B (non-thesis)

This is a one-year program on the main campus.

30 credit hours of coursework is required, of which 15 credit hours of agreed upon courses, are transferable from TSS. The other 15 credit hours include a research class, environmental science and science pedagogy classes as chosen by the graduate student and their advisor.

A concurrent major in Environmental and Natural Resources is an option with this Master's

A Plan A (thesis) may be completed with an extra year of research.

Graduate Assistantships and Scholarships

The SMTC has scholarships and graduate assistantships available for all graduates accepted for the above Master's degree programs. More information upon admission and acceptance.

Water Resources

College of Agriculture and Natural Resources

Department of Ecosystem Science and Management

2013 Agriculture Building

Phone: (307) 766-4274

E-mail: snmiller@uwyo.edu

Web Address: www.uwyo.edu/ware/

Program Director: Scott N. Miller

Degrees Offered

M.A. or M.S. in (Program Name)/Water Resources

Academic departments across the university cooperate to provide master of arts or master of science degree programs that contain multidisciplinary training in water resources. The master's degree offered through these affiliations is awarded as a major with each of the sponsoring department's graduate programs. The water resources interdisciplinary major will be acknowledged on the graduate transcript and thereby certify to potential employers that the candidate has completed an in-depth multidisciplinary course program in the broad area of water resources.

The educational underpinnings of this program include the following:

The purpose of the program is to provide multidisciplinary education and to impart a multidisciplinary perspective to candidates.

Training is to be consistent with the rigor of professional water resources demands.

The interdisciplinary major program is flexible so as to meet the candidates' individual professional objectives.

Primary responsibility for student guidance and graduate program formulation resides with the sponsoring department and sponsoring major professor.

Please refer to latest updated information on the Web site listed above.

Upon acceptance to the program, the sponsoring department must assign a member of the Water Resources Curriculum Committee to the candidate's graduate committee. The Water Resources Curriculum Committee's representatives on the candidate's graduate committee shall aid in formulating deficiency requirements, course program design, academic performance criteria, and research objectives throughout the candidate's tenure in the program.

Program Specific Admission Requirements

University application and fee; Application fee is valid for three years; Official documentation indicating bachelor's degree earned (not necessary if UW is the most recent institution attended);

Potential candidates are encouraged to apply for admission to this program by contacting the participating department and by specifying at the initiation that they desire admission to the water resources interdisciplinary major. Their credentials will be evaluated by the sponsoring department and the department recommends admission of the individual into the program to the UW Admissions office.

Program Specific Degree Requirements

The academic program of study undertaken by the candidate must be designed to enhance the student's background and expertise through formal graduate level coursework in the areas of: (1) technical hydrology, (2) natural resources economics and/or law, and (3) water quality. To insure a minimum multidisciplinary character, the course program must contain nine hours of coursework with at least 3 hours from each of the aforementioned areas and at least 6 of those credit hours must be from outside the student's sponsoring department, along with a 1 credit hour seminar on water resources organized through the Department of Ecosystem Science and Management. Only Plan A master's degree programs, which require the writing of a thesis in the water resources area, are acceptable for the water resources degree option.

A. Hydrology (3 hours)

CE 4800 Hydrology	3
CE 4820 Groundwater and Drainage	
Engineering	3
CE 5810 Groundwater Hydrology.....	3
GEOG 5050 Fluvial Geomorphology.....	3
GEOL 5444 Geohydrology.....	3
GEOL 5550 Numerical Methods	
Groundwater Geology.....	3
GEOL 5570 Advanced Geohydrology	3
REWM 5285 Wildland Hydrology.....	3
SOIL/MATH 5110 Modelling Flow	
Transport in Soil and Groundwater	4
Systems	

B. Law/Natural Resource Economics (3 hours)

- AGEC 4710 Natural Resources Law & Policy3
- AGEC 4720 Water Resource Economics3
- AGEC 5630 Advanced Natural Resource Economics3
- ECON 4400 Environmental Economics3
- ECON 4410 Natural Resource Economics .3
- ECON 5400 Advanced Resource & Environmental Economics.....3
- LAW 6660 Environmental Law.....3
- LAW 6860 Water Rights.....3

C. Water Quality (3 hours)

- GEOL 4490 Geochemistry3
- GEOL 5450 Water Quality Modeling3
- GEOL 5777 Geochemistry of Natural Waters3
- REWM 4710/5710 Watershed Water Quality Management3
- SOIL 4130/5130 Chemistry of the Soil Environment4
- ZOO 4440 Limnology3

D. One-Hour Seminar in Water Issues

- REWM 5250. Seminar in Water Resources .1

Each student in the water resources interdisciplinary major program will be required to complete this course once during their graduate program. As part of the requirements for the seminar: (a) students will be required to present a seminar on a current water resource issue in Wyoming and to develop an executive summary of their issue to distribute to class participants. Each student is also required to participate in a discussion group following each seminar which stresses the interdisciplinary nature of the issue; (b) during the course of a student's graduate program, he/she will be required to present one seminar for the seminar series (preferably on some aspect of their thesis research). This presentation does not have to occur during the semester that the student is officially signed up for seminar credit.

**Agricultural Economics/
Water Resources**

Department of Agricultural and Applied Economics

206 Agriculture Building

Phone: (307) 766-2386

E-mail: ag-econ@uwyo.edu

Web Site: www.uwyo.edu/agecon/

The objective of this program is to provide students with specialized study in water resources and to signify this specialization by the designation of the water resources interdisciplinary major on the transcript.

Coursework and Thesis

Students must complete the 24 credit hour agricultural and applied economics including M.S. core requirements plus 4 thesis hours and 9 credit hours in water resources approved courses.

Achieve a cumulative 3.000 GPA in the AGECE M.S. core requirements.

The candidate's graduate committee, nominated by the major professor, the student and the department head determine the final program of study and thesis research topic, which must be in the water resources area.

Presentation of research results at a formal public seminar.

Completion of an oral examination covering the student's thesis research administered by the graduate committee.

Oral Exam Requirement

In addition to coursework and a Plan A Thesis, students must pass a final oral examination. The student's committee may also require a written examination.

Interdisciplinary Component

nine hours
(see Water Resources degree requirements)

Botany/Water Resources

Department of Botany

114 Aven Nelson Building

Phone: (307) 766-2380

Web Address: www.uwyo.edu/botany

In addition to the general requirements for admission to the existing master's program in botany, the master of science in botany/water resources interdisciplinary major requirements will include the following variations:

Coursework and Thesis

16 semester hours are required in botany, plus 9 semester hours in water resources courses. Other courses in mathematics, physics, chemistry, and statistics also may be required as the special program and undergraduate preparation require.

Due to the various, potential subspecialties that students might follow in connection with a botany/water resources interdisciplinary major, no particular botany courses are prescribed. An appropriate array of courses for the desired specialty will be determined by agreement between the advisory committee, graduate student adviser, student, and with the approval of the Water Resources Curriculum Committee.

For the water resources interdisciplinary major, a Plan A Thesis is required. The student must present his or her research in a seminar before the department, and must pass an oral exam on the thesis research.

Interdisciplinary Component

9 hours
(see Water Resources degree requirements)

Civil Engineering/Water Resources

Department of Civil and Architectural Engineering

3074 Engineering Building

Phone: (307) 766-5255

E-mail: ceinfo@uwyo.edu

Web Address: www.eng.uwyo.edu/civil/

The purpose of this program is to broaden the students' master of science program in the water resource area in civil engineering.

Plan A Thesis Requirement

Only students with a M.S. Plan A thesis option are eligible. The student's graduate committee will include at least one member of the Water Resources Curriculum Committee.

Coursework and Thesis

Each student must complete a minimum of 28 hours of graduate level coursework and a thesis under Plan A (4 credit hours) to qualify for the master of science in civil engineering/water resources.

The student must obtain at least 18 credit hours of graduate level coursework in engineering, emphasizing a concentration of core courses in a particular area of emphasis in civil engineering. The core course areas of emphasis for this program are hydrologic and hydraulic engineering. The particular set of courses for a given area of emphasis will be designated by the faculty in the water resources area for these areas of emphasis with the approval of the Civil Engineering Graduate Committee.

Interdisciplinary Component

- 9 hours
- A. Technical Hydrology (3 hours)
- GEOL 5444 Geohydrology.....3
- GEOL 5550 Numerical Methods in Groundwater Geology I.....3
- GEOL 5570 Advanced Geohydrology3
- REWM 5285 Wildland Hydrology.....3
- REWM 5280 Stream Habitat Management..3
- B. Law/Natural Resource Economics3
(please refer to the general degree requirements for a list of courses)

C. Water Quality (three hours)	
GEOL 5450 Water Quality Modeling	3
GEOL 5777 Geochemistry of Natural Waters	3
MOLB 4410 Water Microbiology	3
MOLB 4500 Microbial Ecology	3
ZOO 4440 Limnology	3

Entomology/Water Resources

Department of Ecosystem Science and Management

2013 Agriculture Building

Phone: (307) 766-3114

Web Address: www.uwyo.edu/esm

Ecosystem Science and Management

E-mail: esm@uwyo.edu

The purpose of this program is to enhance the cross-disciplinary linkage between entomology and water resources, and to provide students an entomology degree program which emphasizes the important issues in water resources. Aquatic insects are increasingly being used as bioindicators of aquatic ecosystem health. This is an area of environmental assessment that is rapidly expanding, as is the job market for scientists with this blend of skills.

Coursework and Thesis

Each student must complete a minimum of 26 credit hours of graduate level coursework and 4 thesis credit hours of ENTO 5960 to qualify for a master of science degree in entomology/water resources. Specific coursework will be determined by the student's graduate committee; however, each student is required to enhance his/her background and expertise in the water resources area through specialized coursework and a seminar as shown below.

- A. ENTO 5678 Aquatic Entomology (3)
- B. Interdisciplinary component
9 hours
(see Water Resources degree requirements)

Plan A Thesis Requirement

Only Plan A thesis students are eligible for the master of science in entomology/water resources. In addition to coursework and a Plan A thesis, students must pass a final written and oral examination. The student's graduate committee will include at least one member of the Water Resources Curriculum Committee to help ensure adherence to the master of science in entomology/water resources degree requirements and that research efforts are in the water area.

Geology/Water Resources & Geophysics/Water Resources

Department of Geology and Geophysics

122 S.H. Knight Geology Building

Phone: (307) 766-3386

E-mail: acadcoord.gg@uwyo.edu

Web Address: <http://geology.uwyo.edu>

The purpose of this program is to formalize and broaden strong department offerings at the master of science level in ground water geology, natural waters geochemistry, mathematical hydrology, and fluvial geomorphology.

Coursework and Thesis

Each student must complete a minimum of 26 hours of graduate level coursework and a Plan A thesis. In addition, the following specific core courses are required for the master of science in geology/water resources and geophysics/water resources degrees.

- A. GEOL 5444 Geohydrology.....3
 - B. 1 of the following:
 - GEOL 4830 Introduction Quantitative Methods in Geology3
 - GEOL 4880 Surficial Processes3
 - GEOL 5050 Introduction to Isotope Geology3
 - C. GEOL 5777 Geochemistry of Natural Waters3
- GEOL 5444 can be used to satisfy the 3 hour technical course requirement or GEOL 5777 can be used to satisfy the 3 hour water quality course requirement.

Admission Requirements

In addition to the department admission requirements, the undergraduate degree program earned by the incoming candidate must meet the minimum undergraduate requirements for the UW geology curriculum in mathematics, physics, and chemistry. The transcript should also demonstrate a strong background in physical geology.

Plan A Thesis Requirement

Only students with a Plan A thesis option are eligible. Students must follow the same program requirements as stated under Geology and Geophysics department section. The student's graduate committee will include at least one member of the Water Resources Curriculum Committee.

Interdisciplinary Component

- 9 hours
(see Water Resources degree requirements)

Rangeland Ecology and Watershed Management/Water Resources

Department of Ecosystem Science and Management

2013 Agriculture C Building

Phone: (307) 766-3114

E-mail: esm@uwyo.edu

Web Site: www.uwyo.edu/esm

The purpose of this program is to enhance the cross-disciplinary linkage between range and forest management and water resources, and to provide students with a degree program in rangeland ecology and watershed management which emphasizes the important issues in water resources.

Coursework and Thesis

- Water Resources requirements*: 10
- Statistics: 3
- Range Management Seminar (REWM 5620): 1
- Other recommended graduate courses or substitution courses with adviser consent: 12
- Plan A thesis credit: 4
- Minimum: 30

- *Water Resources Requirements Interdisciplinary component 9 hours
(see Water Resources degree requirements)
- REWM 5250. Seminar in Water Resources (1)

Soil Science/Water Resources
Department of Ecosystem Science and Management
2013 Agriculture C Building
Phone: (307) 766-3114
E-mail: esm@uwyo.edu
Web Address: www.uwyo.edu/esm

The purpose of this program is to enhance the cross-disciplinary linkage between soil science and water resources, and to provide students a soil science degree program which emphasizes the important issues in water resources.

Coursework and Thesis

Each student must complete a minimum of 26 credit hours of graduate level coursework and 4 thesis credit hours of SOIL 5960 to qualify for a master of science degree in soil science/water resources. Specific coursework will be determined by the student's graduate committee; however, each student is required to enhance his/her background and expertise in the water resources area through specialized coursework and a seminar as shown below.

- A. Core courses - Students must take or have taken equivalent courses in the four soils disciplines: physics, pedology, chemistry, and microbiology.
SOIL 5100 Soil Physics (4)
SOIL 5120 Genesis, Morphology and Classification of Soils (3)
SOIL 5130 Chemistry of the Soil Environment (3)
SOIL 5140 Soil Microbiology (4)
- B. Enhancement courses - Students must take at least one of the following courses:
SOIL 5110 Modeling Flow Transport in Soil and Groundwater Systems
SOIL 5150 Forest and Range Soils
SOIL 5160 Soil Fertility and Fertilizers
SOIL 5170 Analytical Methods for Ecosystems Research
- C. Interdisciplinary component
9 hours
(see Water Resources degree requirements)
- D. REWM 5250 Sem in Water Resources1
- E. SOIL 5720. Graduate Seminar in Soil Science1

Plan A Thesis Requirement

Only Plan A thesis students are eligible for the master of science in soil science/water resources. In addition to coursework and a Plan A thesis, students must pass a final oral examination. The student's graduate committee will include at least one member of the Water Resources Curriculum Committee to help ensure adherence to the master of science in soil science/water resources degree requirements and that research efforts are in the water area.

**Water Resources/
Environmental Science &
Engineering**

The Water Resources/Environmental Science and Engineering (WRESE) program facilitates Ph.D.-level course offerings in water-related disciplines, and coordinates offerings of these courses. Furthermore, the WRESE program serves as a focal-point for water-related graduate research and education at the University of Wyoming.

This interdisciplinary degree program encourages cross-department and inter-college coordination for research and education in hydrology and water resources.

**Zoology and Physiology/
Water Resources**

Department of Zoology and Physiology
114 Aven Nelson
Phone: (307) 766-4207
E-mail: zprequest@uwyo.edu
Web Address: www.uwyo.edu/zoology

The purpose of this program is to broaden the master of science program in the water resources area by having students take 10 semester hours of coursework associated with water resources.

Coursework and Thesis

Each student must complete a minimum of 26 hours of graduate level coursework and 4 hours of Plan A thesis credit to qualify for the master of science in zoology and physiology/water resources. Specific coursework requirements will be determined by the student's graduate committee. The student must obtain at least 10 credit hours as indicated. Depending upon the student's undergraduate background

and career interests, the graduate committee may require that these 10 credits be part of, or in addition to, the 26 credit hours required for a master of science in zoology and physiology.

Interdisciplinary Component

9 hours
(see Water Resources degree requirements)

The Willard C. and Elaine N. Rhoads Scholarship for Graduate Students in Water Resources at the University of Wyoming

The Willard C. and Elaine N. Rhoads Scholarship for Graduate Studies in Water Resources was established to honor Willard Rhoads, a member of the Research Review and Priorities Committee for the Wyoming Water Resources Center and a long-time member of the Wyoming Water Development Commission. Funds for the Rhoads Scholarship were donated to the University of Wyoming by Mrs. Rhoads and her family and friends, with some matching funds provided by the university. Two annual awards for the academic year will be made in the amount of \$1,000 to a master's degree candidates for use in furthering research on Wyoming's water resources.

Eligibility Requirements and Evaluation Procedures

The applicant must be accepted into the interdisciplinary water resources major program administered by the student's academic department.

The applicant must agree to take a minimum of 9 credit hours (including thesis credits) in each of the two semesters for which the award applies.

Applicants for the scholarship can apply more than once, with the exception of past recipients.

The recipient will be chosen by a selection committee appointed by the Water Resources Curriculum Committee.

Applicants meeting the eligibility requirements above will be judged on the basis of promise of academic excellence as evident in grades for graduate level courses, and a recommendation from the student's graduate adviser.

Funds for the academic year will be dispersed to the recipient equally in the fall and spring semesters for half of the total amount.

Application Guidelines

Applicants meeting the above requirements should submit the following:

Application deadline is April 1.

A letter from the applicant listing the name of the scholarship for which he/she is applying, which includes a statement that the applicant agrees to enroll for a minimum of nine hours of graduate level courses (including thesis credits) in each of the two semesters for which the award applies, and a statement of academic and career goals related to water research. The applicant must also state the purpose for which the scholarship funds will be used.

An official transcript of grades for graduate level courses earned at the University of Wyoming or other institutions.

A note from the the academic department, verifying that the applicant has been accepted into a water resources interdisciplinary major program.

A confidential letter of recommendation from the applicant's graduate adviser addressing the applicant's promise for attaining academic and career goals through his/her research in water resources. Up to two additional letters of recommendation can be provided at the applicant's discretion.

The applicant should arrange for all materials to be sent to:

Scott Miller
Chair, Rhoads Scholarship Committee
Department of Ecosystem
Science and Management
Dept. 3354, 1000 E. University Ave.
Laramie , WY 82071-3354

Professors:

KLINT ALEXANDER, B.A. Yale University 1991; Ph.D./M.Phil. Cambridge University 1997; J.D. University of Virginia 1999; Professor of Law 2015.

MELISSA ALEXANDER, B.A. Yale University 1996; J.D. University of Virginia 1999; Professor of Law 2019, 2015.

JACQUELYN BRIDGEMAN, B.A. Stanford University 1996; J.D. University of Chicago 1999; Associate Dean for Academic Affairs and Professor of Law 2008, 2002.

KENNETH CHESTEK, B.A. Pennsylvania State University 1975; J.D. University of Pittsburg School of Law 1979; Professor of Law 2018, 2012.

JAMES M. DELANEY, B.A. University of Washington 1985; J.D. Gonzaga University School of Law 1992; LL.M. in Taxation, University of Florida 1997; Professor of Law 2013.

MICHAEL DUFF, B.A. West Chester University 1991; J.D. Harvard University 1995; Professor of Law 2012.

STEPHEN D. EASTON, B.A. Dickinson State University; J.D. Stanford University; Professor of Law 2009.

STEPHEN M. FELDMAN, B.A. Hamilton College 1977; J.D. University of Oregon 1982; J.S.M. Stanford University 1986; Jerry W. Housel/Carl F. Arnold Distinguished Professor of Law 2002.

MARK GLOVER, B.A. Washington University in St. Louis 2002; J.D. Boston University School of Law 2008; LL.M. Harvard Law School 2011; Professor of Law 2019, 2015.

DARRELL D. JACKSON, B.A. College of William and Mary 1987; J.D. George Mason University School of Law 1990; Ph.D. University of Colorado School of Education 2011; Professor of Law 2018, 2013.

SAM KALEN, B.A. Clark University 1980; J.D. Washington University 1984; Professor of Law 2014, 2009.

NOAH B. NOVOGRODSKY, B.A. Swarthmore College 1992; J.D. Yale Law School 1997; Professor of Law 2013, 2009.

JASON ROBISON, B.S. University of Utah 2003; J.D. University of Oregon 2006; LL.M. Harvard Law School 2009; S.J.D. 2013; Professor of Law 2019, 2015.

ALAN ROMERO, B.A. Brigham Young University 1990; J.D. Harvard University 1993; Professor of Law 2007, 2003.

MICHAEL R. SMITH, B.S. Florida State University 1982; J.D. University of Florida 1985; Professor of Law 2006.

Associate Professors:

DANIELLE R. COVER, B.A. University of Maryland 1994; J.D. Tulane University School of Law 1997; Associate Professor of Law 2018, 2014; Director of Legal Services Clinic.

LINDSAY A. HOYT, B.A. University of Wyoming 1999; J.D. 2003; Associate Professor of Law 2018; Assistant Dean.

TARA RIGHETTI, B.A. University of Colorado Boulder 2005; J.D. 2007; Associate Professor of Law 2019, 2014.

Assistant Professors:

LAUREN MCLANE, B.S. Radford University 2002; J.D. Seattle University School of Law 2008; Assistant Professor of Law 2018; Director, Defender Aid Clinic.

TEMPLE STOELLINGER, B.S. University of Wyoming 2004; J.D. 2010; Co-Director, Center for Law and Energy Resources in the Rockies 2013; Assistant Professor of Law 2019.

Academic Professionals:

AMY K. PEARCE, B.A. Central Michigan University 1997; M.L.I.S. Wayne State University 1999; M.Ed. George Mason University 2004; Assistant Librarian 2018; Head of Public Services.

DEBORA PERSON, B.A. Arizona State University 1981; M.L.S. Rutgers University 1992; Library Associate 1993; Administrative Law Librarian 2005, 1994.

TAWNYA PLUMB, B.A. University of Wyoming 1996; M.L.I.S. University of Texas at Austin 1998; Electronic Services and Assistant Librarian 2004.

Professors Emeritus

Debra L. Donahue, Harvey Gelb, Timothy Kearley, Jerry R. Parkinson, Dee Pridgen, Joel Selig, Elaine A. Welle

The College of Law was founded in 1920. The goal of the college is to provide a sound and thorough education in the law that will prepare the student to practice law in accordance with the highest standards of professional competence and responsibility. The emphasis in instruction is on analysis and understanding of legal principles and the development of skills necessary to the practice of the profession. The course of study will prepare a graduate to practice in any jurisdiction which has adopted the Anglo-American system of law.

The curriculum of the College of Law consists of three years of study within the college. Required courses necessary to basic legal

knowledge make up the first two semesters of study, while courses in the final four semesters are largely elective. Students become eligible to receive the Juris Doctor (J.D.) degree upon successful completion of 90 semester credit hours of law courses with a grade point average of at least 2.000.

The college acts as a law center for Wyoming. It serves lawyers, judges, and government by a program of continuing legal education for attorneys and others interested in significant legal developments, by research projects aimed at improving state law, and by publishing the Wyoming Law Review.

Accreditation

The college is approved by the American Bar Association and its graduates are eligible for admission to the bar in every state. A student planning to practice in a particular state should check its rules for admission to the bar.

The college is also a member of the Association of American Law Schools. Membership is conditioned upon the maintenance of an adequate teaching staff and library, the offering of a sound educational program and adherence to prescribed standards for the admission and graduation of students.

Prelegal Curriculum

There is no prescribed or required set of courses for prelegal work. A student must usually have a B.A. or B.S. degree before beginning the professional study of law. There are no restrictions on the field in which the degree is earned.

The objective of prelegal study should be to acquire knowledge and skills useful in the study and practice of law. College study should prepare the student for law school by developing language comprehension and use, understanding of political, economic, social and cultural institutions, and the ability to think logically and creatively. Courses promoting these objectives are included in the basic requirements for most undergraduate degrees. The choice of a major should be determined by the student's academic interest and professional objective in law.

Valuable background may be acquired through the study of English, history, philosophy, economics, political science, psychology, sociology, business administration, mathematics and the natural sciences.

For additional information, see the College of Law web site, (www.uwyo.edu/law).

Admission Requirements and Procedures

Admission to the professional curriculum in law is granted by the admissions committee of the College of Law. The College of Law restricts the number of entering students to a class size consistent with its facilities and its educational objectives. In evaluating an application, the committee considers the applicant's undergraduate college scholastic record and score on the Law School Admission Test (LSAT).

Other criteria relevant to the probability of success in the study and practice of law will also be considered.

1. Prior to beginning work in the College of Law, applicants must have a bachelor's degree from an accredited college or university, unless they have requested and been granted following exception:
 - a. An applicant who needs not more than 6 semester hours of college credit to qualify for a bachelor's degree may be admitted in exceptional cases to law school if the committee determines that the applicant has sufficient education and preparation for the study of law; has an outstanding undergraduate scholastic record; and has an approved program signed by the appropriate undergraduate official indicating that the remaining requirements for the bachelor's degree may be met by summer school attendance or by other means that will not interfere with the study of law.
2. Every applicant must take the Law School Admission Test. A packet giving information about the test, the dates on which it is given, and centers at which it can be taken, sample questions and an application form, may be obtained from Law School Admission Council, Box 2000, Newtown, PA 18940, by phone at (215) 968-1001, online at www.lsac.org.
3. Every applicant must register with the Law School Admission Council Credential Assembly Service, CAS. Registration may be done through the LSAC website (www.lsac.org). The CAS will prepare a report that is transferred to the college.
4. Every applicant must complete the electronic University of Wyoming College of Law Application through LSAC between

September 1 and April 30. Applications received by December 15 will be considered for early admission.

5. If admitted, official transcripts sent directly to the College of Law from each college attended must be on file in the Admissions Office at least 30 days before the student's registration date.

Application Deadline

An initial entering class will be selected from completed applications on file on April 30. Students who submit an application by December 15 will be considered for early admission. An application is complete only when the college has received the LSAT score, the CAS report, and the College of Law application form. Applications completed after April 30 will be considered in filling vacancies which occur in the entering class initially selected.

Admission With Advanced Standing

Transfer students are admitted only when the College of Law facilities and curriculum permit. A transfer student may transfer up to the number of credits the student could have earned had the student completed his or her first year at the University of Wyoming College of Law. Transfer credit will be given only for courses in which the student earned a grade of C or higher. Applicants admitted must satisfy the requirements for graduation established by the College of Law, including such other requirements as may be imposed as a condition of admission. Students interested in transferring should contact the College of Law for information concerning application procedures.

Academic Regulations

The Juris Doctor (J.D.) degree is awarded by the College of Law faculty to candidates who meet the following requirements:

For students matriculating before the fall 2013 semester, each student must successfully complete (grade of "D-" or better for courses taken at this school, grade of 'C' or better for courses taken elsewhere) 89 credit hours (required for graduation) in accordance with the official curriculum as adopted by the College of Law faculty. At least 58 of these credits must be completed at the University of Wyoming College of Law. For students matriculating in or after the fall 2013 semester, each student must successfully complete (grade of "D-" or better for courses taken at this school, grade of "C" or better for courses taken elsewhere) 90 credit hours (required for graduation) in accordance with the official curriculum as

adopted by the College of Law faculty. Curriculum is subject to change at the College of Law Faculty's discretion, which may cause the annually updated catalog to be out of date. At least 59 of these credits must be completed at the University of Wyoming College of Law. Regardless of the matriculation date, students must complete at least 76 credit hours through graded (A-F) courses. Courses taken for S/U grades count toward the hours required for the J.D. degree only if the course is offered for the S/U grade only.

The course of study must be completed no earlier than 24 months (2 years) and not later than 84 months (7 years) after a student has commenced law study. No student shall be permitted to enroll at any time in coursework that, if successfully completed, would exceed 20 percent (18 hours) of the total coursework required for graduation.

Second and third year students may take up to six of 90 hours required for graduation in non-law school graduate level courses (online courses will not be approved) and apply them toward their law degree. Those students enrolled in a joint degree program may take up to 9 hours required for graduation in non-law school graduate level courses (online courses will not be approved) and apply them toward their law degree. Students must receive a letter grade of B or better for these non-law courses to count toward graduation requirements. Additionally, these courses will transfer in with a satisfactory grade of 'S' and will not impact their law school gpa. The College of Law automatically approves up to 9 hours of joint degree core courses that meet this grade requirement to transfer in toward their law degree (see Joint Degree section). If additional courses are needed outside of the core courses, these will be approved on a case-by-case basis. Students in a joint degree program who use 9 non-law credit hours toward their J.D. degree may reduce their required number of graded credits from 76 to 73 so that they can participate in other S/U offerings at the College of Law. To receive law school credit for the non-law course, a student will be required to earn a grade of B or better in the non-law course. The grade will not count, however, toward the student's law school GPA. The course will be counted as a "satisfactory" grade for purposes of the student's law school GPA. Students who wish to enroll in a non-law course on this basis must secure the prior approval of the course professor and the Associate Dean of Academic Affairs at the College of Law. Approval will be based on the student's submission of a brief written statement explaining how the

proposed coursework relates to and enhances the student's legal education. Students should be aware that non-law courses completed on this basis will not count toward the 76 hours that students must complete in graded courses as a requirement for graduation. The non-law coursework will instead be counted as credits the law students are permitted to take on an S/U basis.

To graduate, all students must earn a cumulative grade point average of 2.000 for all courses taken at the College of Law. If a course is repeated, both grades shall be included in computing the average. The student must have a baccalaureate degree. Candidates who meet these requirements are eligible for graduation at the end of any semester.

Academic Standing

The following requirements apply to any coursework at the College of Law. Courses that law students may complete outside of the College of Law do not count in calculation of the required College of Law grade point average (GPA).

In the first year, a student who fails to make a 1.800 GPA after the first semester, or fails to make a 1.900 cumulative GPA overall in the first year's work, shall be excluded from the College of Law. A student who at any time fails to make a passing grade in two of the courses for which the student is registered for any semester shall be excluded from the College of Law.

A student who enters the second year with a GPA lower than 2.000 but at 1.900 or above, or who fails to maintain a 2.000 cumulative GPA after the first year, shall be placed on probation. A student on probation who does not attain an overall grade point average of 2.000 within one semester shall be excluded.

A student excluded from the College of Law may petition the faculty for reinstatement. The faculty may, in its discretion, reinstate the student upon receipt of satisfactory evidence of extenuating circumstances or marked improvement in grades and study habits. Reinstatement may be subject to conditions, including, but not limited to, the repeating of any or all courses, as the faculty may decide. If a student's petition for reinstatement is denied, said students must wait 9-months before petitioning again for reinstatement. Also, all students are limited to two petitions for readmission. Students are strongly encouraged to include all information pertinent to the readmission decision in their initial petition. The entire faculty will automatically hear and consider a student's initial petition. In the event of a second petition

for readmission, a committee selected by the Dean will hear and consider the petition. The committee will present a report and recommendation to the faculty for adoption. Denial of a second petition is final.

Advanced Writing Requirement

As a condition of graduation, all students must complete an upper-level writing requirement consisting of a research paper of a minimum length of 5,000 words, exclusive of footnotes. All students must follow a designated standard citation form. Students must submit a detailed outline of the paper to the supervising professor, then must rewrite the paper at least once after the professor reviews the first draft. With the professor's approval, the student can meet the advanced writing requirement in any law school elective course, including a seminar, as long as the above requirements are met. The supervising professor must certify that the writing requirement has been fulfilled.

All student articles written for law review, whether published or unpublished, must have a supervising faculty member and otherwise meet all other provisions of the College of Law Advanced Writing Requirement. A student may also fulfill the requirement through an independent study or by writing a case note or comment for the law review, under the supervision of a professor. It cannot be satisfied through participation in a clinic.

Experiential Learning Requirement

For students matriculating in the fall 2016 semester and after, as a condition of graduation, each student must successfully complete no fewer than 6.0 credit hours in experiential learning courses. An experiential learning course must be a simulation course, a law clinic, or a field placement. Simulation courses provide substantial experience not involving an actual client, that (1) is reasonably similar to the experience of a lawyer advising or representing a client or engaging in other lawyering tasks in a set of facts and circumstances devised or adopted by a faculty member; and (2) includes: direct supervision of the student's performance by the faculty member; opportunities for performance, feedback from a faculty member, and self-evaluation; and a classroom instructional component (ABA Standard 303).

Students may fulfill the experiential learning requirement by successfully completing 6.0 credit hours in any of the following upper-class elective courses:

- Advanced Appellate Advocacy (6520)
- Advanced Legal Research (6990)

- Advanced Oil & Gas Law (6992)
- Advanced Persuasive Writing (6925)
- Alternative Dispute Resolution (6915)
- Business Planning (6560)
- Civil Pretrial Practice (6565)
- Clinic: Civil Legal Services (6930 or 6931)
- Clinic: Defender Aid (6932 or 6930)
- Clinic: Energy, Environ. & Natural Resources (6933 or 6930)
- Clinic: Family & Child Advocacy (6930 or 6934)
- Clinic: International Human Rights (6930)
- Clinic: Prosecution Assistance (6930 or 6936)
- Contract Drafting (6935)
- Estate Planning (6670)
- Estate Planning Practicum (6937 or 6930 or 6915)
- Externships (6960)
- Interviewing, Counseling & Negotiation (6166 or 6915)
- Summer Trial Institute (6850)
- Trial Practice (6850)

Note: classes may be removed from and/or added to this list each semester.

Curriculum

Required Courses: First (1L) Year Students (Additional courses cannot be taken the first year without special permission from a dean).

Fall Semester

- Civil Procedure I (6240) – 3
- Contracts I (6110) – 3
- Legal Research (6165) – 1
- Legal Writing I (6160) – 3
- Property I (6120) – 3
- Torts I (6130) – 4

Spring Semester

- Civil Procedure II (6340) – 2
- Constitutional Law I (6250) – 3
- Contracts II (6210) – 2
- Criminal Law (6140) – 3
- Legal Writing II (6260) – 2
- Property II (6220) – 2

Required Courses: Second (2L) Year Students (offered once per year)

- Evidence (6410) – 3
- Professional Responsibility (6420) – 3

Elective Courses: Second (2L) & Third (3L) Year Students (* subject to availability)

See Law Courses section

Graduation with Honors

The degree of Juris Doctor is awarded with honors if the student achieves a grade point average of 3.400 or better on all resident credit in the College of Law.

Honor Roll

Students enrolled in a minimum of 12.0 semester hours of law courses carrying A–F grades, and who have no semester grades of incomplete (I), are eligible for the President's Honor Roll and the Dean's Honor Roll. Students with a semester average of 4.000 will be named to the President's Honor Roll. First-year students with a semester average of 3.250 or better and second-year and third-year students with a semester average of 3.400 or better will be named to the Dean's Honor Roll.

Minimum Hours

The College of Law does not permit students to attend on a part-time basis. Students are required to take the full load of required courses during their first two semesters and to carry at least 9 credit hours in each of the remaining semesters of law study. Notwithstanding, if a student has less than 9 credits remaining in their final semester of study, then said student may register for only the number of remaining credits (e.g. if a student only has 4 credits left to graduate, that student will only be required to register for 4 credits). First year students will be allowed to take less than the full load of required courses only if they present exceptional circumstances, as determined by the Dean or his/her delegate.

Transfer Credits

The College of Law admits transfer students only in the fall of their second year. A student granted transfer admission may transfer credits earned in courses taken at another ABA-accredited law school toward a degree from the UW College of Law up to the number of credits that a traditional UW student would have earned during the student's first year at the University of Wyoming (32 credits as of the 2013–14 academic year). In addition, University of Wyoming law students who visit out for a semester or full year may also transfer credits from other ABA approved law schools, as long as 59 credits are completed at the University of Wyoming. The College of Law will also accept up to 15 hours of transfer credit from another ABA accredited school for an international student previously enrolled in an LL.M. or other post-J.D. program. To receive transfer credit from a course, a grade must be a "C" or better. Transfer credits are recorded on the JD transcript as an "S" (Satisfactory), instead

of graded credits. All transfer credits must be approved by the Associate Dean of Academic Affairs in advance.

Joint Degree Programs

JD/MA in ENR Program

A joint Juris Doctor/Master of Arts of Environment and Natural Resources degree is available to all admitted law students upon application. Students in this joint degree program must take 18 credits outside the law school in ENR courses, and must take 12 law school credits from a menu of ENR related law courses to qualify for this joint degree. Students in the joint degree program must also complete a supervised research project. Additionally, nine (9) credits of approved MA coursework (see Academic Regulations) will be applied to the Juris Doctor degree. Current core courses: ENR 5000, ENR 5900, ENR 5890.

JD/MBA Program

A joint Juris Doctor/Master of Business Administration program is available in the College of Law and the College of Business. This program will take approximately four years to complete. Students spend three years on-campus engaged in law studies. In either their second or third year, students will be enrolled full-time in the MBA Program, taking core Fall and Spring business courses followed by participation in an MBA Summer Project. The MBA Capstone course will be completed during the student's third year for a total of 38 MBA Program credits. Nine (9) credit hours of approved Law coursework will be transferred as elective hours to the MBA Program for a total of 47 credit hours. Additionally, nine (9) credits of approved MBA coursework (see Academic Regulations) will be applied to the Juris Doctor degree. Students successfully completing this lock-step program will earn dual Juris Doctor and Masters of Business Administration degrees.

Current core courses: MBAM 5102, MBAM 5103, MBAM 5104, MBAM, 5107, MBAM 5108, MBAM 5202, MBAM 5203, MBAM 5204, MBAM5206, MBAM 5207, MBAM 5208, MBAM 5309

JD/MPA Program

A student in the joint Juris Doctor/Master of Public Administration program must be admitted to both the College of Law and College of Arts and Sciences. The degrees are awarded concurrently by each college upon successful completion of the combined degree program requirements. In fulfillment of the J.D. degree, the College of Law will accept up to nine hours of MPA credits in courses approved by

the law faculty (see Academic Regulations). In fulfillment of the MPA degree, the College of Arts and Sciences will accept up to 12 hours of credits earned in specified courses in the J.D. program. For additional information regarding these joint degree programs, contact the College of Law or the joint program of interest. Current core courses: POLS 5000, POLS 5400, POLS 5410, POLS 5440, POLS 5684, POLS 5510, POLS 5690, POLS 5080, POLS 5060, POLS 5450, POLS 5460, POLS 5480.

Nonprofessional Degree Students

Graduate students from other colleges of the University of Wyoming may be permitted to take one or more law courses on an S/U basis for non-law credit when the following conditions are met: the law course taken is acceptable for their degree program and the prior written approval of the professor assigned to the course and the Associate Dean or Assistant Dean has been obtained. In order to obtain audit or visitor privileges, students must obtain prior written approval of the professor assigned to the course and the Associate Dean or Assistant Dean. For further information and requirements contact the Associate Dean of Academic Affairs, College of Law, Dept. 3035, 1000 E. University Ave., Laramie, WY 82071.

Course descriptions may be obtained online at www.uwyo.edu/law.

Law (LAW)

610. Contract I. 3 (Max. 3). A study of the elements of simple contracts, including offer and acceptance, consideration, conditions, defenses, and damages. The impact of the Uniform Commercial Code on contracts is considered.

6120. Property I. 3 (Max. 3). Covers two general areas. The first area is the rights that define property ownership, in relation to neighbors, the world, and others with interests in the property. Subjects include rights to use the land and its products, estates, concurrent ownership, and landlord-tenant law. The second area is private limitations on those rights, in the form of covenants and easements.

6130. Torts I. 4 (Max. 4). Study of the methods and policies for allocating risks of harm; intentionally inflicted harms; negligence in its general aspects and its application to products liability, landowners, and automobile traffic; emotional harms; defamation; and fraud. Principal areas of coverage typically include wrongful death, defenses, vicarious liability, strict liability, nuisance, products liability and defamation. If time permits we will also cover privacy, misrepresentation and other topics.

6140. Criminal Law. 3 (Max. 3). The sources of criminal law and the purposes of criminal punishment, the constituent parts of criminal conduct, including act (or omission), culpable mental state, result, and causation. These general principles are brought to bear on homicide and sexual assault. Also considers common defenses to criminal charges, including self-defense, necessity, duress, insanity, and intoxication. Students are required to consider the constitutional limits of the criminal law and the relationship of substantive principles to practice.

6150. Judicial Remedies. 3 (Max. 3).

6160. Legal Writing I. 3 (Max. 3). In this course students are introduced to the fundamentals of legal reasoning and analysis and the basics of legal writing.

6165. Legal Research. 1 (Max. 1). Introduction to paper and electronic resources that cover primary & secondary legal materials, including case law, statutes, agency regulations for federal and state jurisdictions, & treatises, journals, restatements, and other secondary sources. Discusses research plans and develops brief research strategies for hypothetical situations.

6166. Interview, Counseling and Negotiation. 3. Introduction to the basic lawyering skills of interviewing, fact investigation, counseling, and negotiation. Employs simulation exercises, self-critiques, and feedback from the faculty member as well as other students. In addition to the exercises, exposure to the theoretical underpinnings of the skills and examine some of the ethical issues involved in creating and maintaining professional relationships with clients and opposing parties and counsel.

6210. Contracts II. 2 (Max. 2). A study of the elements of simple contracts, including offer and acceptance, consideration, conditions, defenses, and damages. The impact of the Uniform Commercial Code on contracts is considered.

6220. Property II. 2 (Max. 2). First covers some private and public limitations on owners' property rights, primarily easements and zoning. The rest of the semester deals with acquiring ownership rights, possession and transfers, including the law relating to deeds and titles.

6240. Civil Procedure I. 3 (Max. 3). A study of modern practice in civil cases under Rules of Civil Procedure and other sources of procedural law. Civil Procedure I and its continuation, Civil Procedure II, cover all aspects of jurisdiction and other issues bearing on what court(s) may hear a case; choice of state or federal law; pleading; joinder of

claims and parties; class actions; discovery and other pre-trial procedures; summary judgment; non-jury and jury trials; appeals; and claim and issue preclusion.

6250. Constitutional Law I. 3 (Max. 3). Constitutional Law I is divided into two parts. Part I focuses on governmental structures. Part II begins our coverage of individual rights and liberties. Part I's coverage includes the power of judicial review, separation of powers, federalism, and congressional powers. Part II focuses on equal protection.

6260. Legal Writing II. 2 (Max. 2). This course builds on the first semester Legal Writing course by introducing students to: (1) more sophisticated aspects of legal reasoning, analysis and legal research; (2) the basics of persuasive legal writing; (3) the basics of appellate procedure and an appellate brief; and (4) the basics of oral advocacy.

6310. Business Organizations. 3 (Max. 3). Studies the law of agency relationships and business associations including partnerships, limited liability companies and corporations. Also considers the protection afforded investors by federal securities law. Listing of the above items is not intended to be all inclusive. Students are invited to consult with the instructor regarding specific information.

6320. Income Taxation. 3 (Max. 3). Focuses on the federal taxation of individuals. It includes taxation of compensation, installment sales as well as taxation of gains on property transfers.

6330. Trusts and Estates. 3 (Max. 3). A survey course that also serves as an introduction to Estate Planning. Covers the law of wills, trusts, and intestate succession. It also includes execution and revocation of wills; creation, modification, and termination of trusts; problems of construction; restrictions on testate transfers, transfers in trust and future interests. Covers some aspects of fiduciary administration, but not taxation. A prerequisite for Estate Planning.

6340. Civil Procedure II. 2 (Max. 2). A study of modern practice in civil cases under Rules of Civil Procedure and other sources of procedural law. Civil Procedure I and its continuation, Civil Procedure II, cover all aspects of jurisdiction and other issues bearing on what court(s) may hear a case; choice of state or federal law; pleading; joinder of claims and parties; class actions; discovery and other pre-trial procedures; summary judgment; non-jury and jury trials; appeals; and claim and issue preclusion.

6350. Constitutional Law II. 2 (Max. 2). Focus on constitutionally protected individual rights and liberties. Specifically, the following

topics will be covered: substantive due process, including the right of privacy; procedural due process; freedom of expression; and religious freedom.

6410. Evidence. 3 (Max. 3). A study of the means by which any alleged fact is established or disproved, including competency of witnesses; direct examination; cross-examination and impeachment; privileges; basic and special issues of relevancy; the hearsay rule and its exceptions; real, demonstrative, and documentary evidence; opinion and scientific evidence; judicial notice; and the responsibility of proof.

6420. Professional Responsibility. 3 (Max. 3). A study of the duties of attorneys to their clients and the public under the Model Rules of Professional Conduct and case law.

6510. Administrative Law. 3 (Max. 3). A review of administrative law practice and procedure, primarily at the federal level. The course begins with materials on the nature and function of administrative agencies. Agency rulemaking power, emphasizing federal and state Administrative Procedure Act (APA) requirements. Considers the adjudicative powers of administrative agencies, including an agency's obligation to afford persons due process of law. Finally, the course examines judicial review of administrative agency decisions.

6530. American Legal History. 3 (Max. 3). A study of the life of John Marshall, Chief Justice of the United States from 1801 until 1835.

6540. Antitrust. 3 (Max. 3). The study of the federal laws regulating monopolies and restraints of trade. The substantive provisions of the antitrust laws are relatively brief - there are only three main statutes - the Sherman Act (1890), the Clayton Act (1914) and the FTC Act (1914). These statutes entail broad prohibitions, and there are no detailed regulations like the tax code.

6550. Bankruptcy. 2 (Max. 2). A survey of the Federal Bankruptcy Act. Includes consideration of liquidation, reorganization, family farmers, debts of individuals, and the relationship of bankruptcy law and proceedings to Article 9 of the Uniform Commercial Code and the law of mortgages.

6555. Bioethics. 3. Analyzes the relationship between law and ethics in healthcare. Covers a wide range of contemporary issues such as euthanasia, assisted reproductions, and employee wellness programs. In addition to teaching substantive law, emphasizes critical thinking and provides students an opportunity to practice researching, writing, presenting, and delivering persuasive oral arguments.

6560. Business Planning. 3 (Max. 3). Focus is primarily on a problem involving several persons who are organizing a business entity. Consideration will be given to the characteristics of several kinds of business organizations and to making a judgment as to which organization should be used to house the business being set up. Considers tax and non-tax aspects with respect to business organizations.

6565. Civil Pretrial Practice. 3 (Max. 3). Includes the civil litigation process from the filing of a complaint and decisions related to the complaint, to discovery including written discovery and depositions, to pre-trial motions such as motions to change venue, to exclude evidence, and for summary judgment, to preparation for pre-trial conferences and trial. Sample cases provide the basis for the drafting of various discovery documents and motions. There will be no exam.

6570. Payment Systems. 3 (Max. 3). Focus on the use of negotiable instruments (such as checks, drafts, promissory notes, and certificates of deposit) to document debts and to make payments. Provides an overview of the banking system, the check collection process, and the use of various commercial instruments. Topics include liability for stolen checks, forged signatures, alterations, payment to impostors, insufficient funds, stop payment orders, post-dated checks, and restrictive endorsements. In addition, the rights of good faith purchasers are examined and the use of third parties (such as guarantors, sureties, and accommodation parties) to secure obligations are discussed.

6600. Consumer Protection. 3 (Max. 3). Covers three main topics: (1) the law of advertising and marketing; (2) consumer credit regulation; and (3) consumer warranty law.

6615. Taxation of Business Entities. 3 (Max. 3). Surveys the federal income tax consequences of major events in the existence of business entities and their owners including formations, contributions, operations, distributions, redemptions, and liquidations. Compares taxation of Subchapter C corporations, Subchapter S corporations, and partnerships. Students spend significant time on statutory interpretation and along the way consider policy issues that affect how the taxation of businesses is structured and enforced under the Internal Revenue Code.

6620. Bankruptcy Law. 3 (Max. 3). After briefly surveying state collection laws, considers the impact of federal bankruptcy law on secured and unsecured creditors. The primary focus of the course is on consumer bankruptcy

under Chapter 7 (liquidations) and Chapter 13 (reorganizations). Concludes with an introduction to Chapter 11 (business reorganizations).

6630. Criminal Procedure. 3 (Max. 3). Examines the constitutional rights of criminal suspects and defendants under the 4th, 5th and 6th Amendments of the United States Constitution. Much of the focus is on law enforcement practices and the constitutional principles that constrain the police.

6635. Domestic Violence Law. 3 (Max. 3). Helps prepare students to take part in the Legal Services Program, which has been expanded to include a Domestic Violence Legal Assistance Project.

6640. Family Law. 3 (Max. 3). From marriage to divorce, property distribution, child custody and the termination of parental rights, explores the many areas and facets of family law with an eye toward providing students with a firm doctrinal grounding, while preparing them for what they will face as they enter into practice. In the context of this exploration we look closely at many of the cultural issues noted above, and the effects those issues are having not just on the family and the law related to the family, but on society as a whole.

6645. Children and the Law. 3 (Max. 3). Covers a range of children's issues, including: dependency; termination of parental rights; adoption, child custody and support; parental rights; and the juvenile justice system. It is suitable for students considering a career in child advocacy, or who have any interest in the subject of juvenile law. Prerequisite: completion of first year of law school.

6660. Environmental Law. 3 (Max. 3). Provides an overview of the broad field of environmental law, with an emphasis on the major federal environmental statutes such as the National Environmental Policy Act, the Endangered Species Act, the Clean Air and Clean Water Acts, and statutes regulating both hazardous wastes and toxic chemicals in commerce. In considering these various statutes, we consider both their substantive requirements and their conceptual approaches to environmental protection. Touches briefly on issues such as the role of states in implementing these national laws, various approaches to enforcement of these laws, common-law doctrines relevant to environmental protection, and economic aspects of environmental law.

6665. Education Law. 2. Study of law as it applies to public and private education in America, including federal and state regulation of education, constitutional rights of students and teachers, school financing, desegregation and affirmative action, and equal opportunity in education. Introduction to the most

important legal issues relating to primary and secondary (K-12) education, and to a lesser extent issues concerning higher education.

6670. Estate Planning. 2 (Max. 2). Applies estate and gift tax principles in a survey of estate planning principles and techniques. Traditional estate planning tools including wills, trusts, and durable powers of attorney are discussed as well as post-mortem planning, administration issues, and planning for special situations, such as owners of closely held businesses, entrepreneurs, and the disabled.

6675. Gift and Estate Taxation. 2 (Max. 2). Focuses on the federal estate and gift tax consequences of wealth transfers. Students learn to analyze the federal estate and gift tax section of the Internal Revenue Code. *Prerequisites:* income taxations, trusts and estates.

6680. Federal Courts. 3 (Max. 3). Examines the themes of separation of powers and federalism by scrutinizing the jurisdiction of the federal courts. Covers justiciability doctrines (standing, ripeness, and mootness), congressional power to control federal court jurisdiction, constitutional and statutory parameters of federal question jurisdiction, federal common law, basic contours of litigation under 42 U.S.C. 1983, state sovereign immunity and the Eleventh Amendment, and the various abstention doctrines.

6685. Health Law. 3. Introduces students to a wide variety of law governing health care. Study professional licensing and liability, institutional regulation and liability, EMTALA, ERISA, the Affordable Care Act, Medicare, Medicaid, and fraud and abuse laws. Provides a critical first step for students interested in specializing in health law and an overview for any general practitioner.

6700. Indian Law. 3 (Max. 3). Surveys the law that applies to Native Americans and tribal governments. Deals primarily with federal law because of the unique relationship between the federal government and tribes, which are sovereign entities, and because federal law controls most Native American activities. The main issues are jurisdictional; that is, they concern the allocation of legislative (or regulatory) and judicial (both civil and criminal) jurisdiction among federal, tribal, and state governments.

6710. Insurance Law. 2. Discussion of all types of insurance from the point of view of an attorney advising clients and of a consumer. It is relevant and important for those going into any aspect of the law as insurance is involved in most law from business to litigation to domestic to estate planning. Covers standard insurance policy language, as well as case law and practical ideas for dealing with insurance.

6715. Immigration Law. 3 (Max. 3). Practical approach to topics such as the standards for admission of immigrants; nonimmigrant visas for students, workers and tourists; regulation and exclusion of undocumented aliens; legal procedures for admission, exclusion and deportation; refugee law; and citizenship law. Additionally, legislative history and policy behind applicable legislation and case law is discussed. *Prerequisites:* completion of the first year of law school.

6720. International Law. 3 (Max. 3). Covers international law in its classic sense—public international law, or “the law of nations” as it’s referred to in the Constitution. Looks at topics such as the sources and evidence of international law, sovereignty, the relationship of international law to national law, the bases of national jurisdiction, the international use of force, human rights, etc. However, modern public international law also includes areas of more immediate interest to practicing lawyers, such as conflicts between nations over which one has the right to assert jurisdiction over certain activities, international extradition, and immunities from jurisdiction.

6725. Intellectual Property. 3 (Max. 3). Introductory overview of principles of intellectual property protection particularly trademark, copyright and patent law. USA law will be integrated into a comparative analysis of International intellectual property law.

6730. Jurisprudence. 3 (Max. 3). Examines American legal thought from the nation’s inception through today. Discusses issues related to the nature of law, the nature of judicial decision making, the relationship between law and society, and the like.

6735. Native American Natural Resources Law. 3 (Max. 3). Examines federal and tribal law, (chiefly statutes, regulations, cases and treaties), governing environmental regulation and management of tribal land water minerals, fish and wildlife, and cultural resources. Explores the federal trust doctrine, aboriginal title, reserved rights, allotment, and the tribes-as-states-doctrine.

6740. Labor Law. 3 (Max. 3). Deals with labor law in the private sector. Surveys the establishment of a collective bargaining relationship between employers and unions, the subsequent negotiation of a collective bargaining agreement resulting from that relationship, the administration of that agreement through its grievance-arbitration provisions, and the economic weapons used by parties to various kinds of labor conflicts.

6745. Employment Law. 3 (Max. 3). Examines a variety of laws, regulations and legal theories governing the workplace and the

employment relationship. In particular we look at the at-will doctrine and its exceptions, rules affecting the establishment of the employment relationship and rules affecting the termination of the employment relationship.

6750. Law and Economics. 2 (Max. 2). The use of microeconomic theory to assess the economic efficiency and equity consequences of alternate legal structures.

6755. Legislation. 3 (Max. 3). Examines how statutes are made and applied. Priorities are 1) legislative process in Congress and the state legislatures (especially Wyoming), and; 2) statutory interpretation tools and techniques.

6760. Local Government Law. 3 (Max. 3). Examines the organization, powers, responsibilities, liabilities and financing of units of local government, including counties, cities, school districts and other special districts. Interrelationships among local governments, the states and the federal government are studied. Leading judicial decisions as well as state and federal constitutional and statutory provisions will be assigned. Particular emphasis is placed on the law of Wyoming and other western states.

6765. International Business Transactions. 3 (Max. 3). Overview of international business transactions involving private entities engaged in global commerce. Examines legal framework associated with planning, implementation, and enforcement of international agreements concerning sale of goods, trade of services, and transfer of technology. Impact of relevant international organizations and emerging substantive international commercial law with social obligations of multinational enterprises. *Prerequisite:* completion of first year of law school.

6775. International Human Rights. 3 (Max. 3). An examination of norms, institutions and problems relating to international human rights law. Addresses civil and political rights questions (including the expanded use of international criminal law as a means of enforcing universal values), social and economic rights (including access to medicines) and select group rights issues. *Prerequisites:* completion of the first year law school curriculum.

6790. Oil and Gas. 3 (Max. 3). A study of the law regarding private property interests in oil and gas. Subjects include the acquisition, transfer, lease, and assignment of oil and gas interests; rules and contracts governing the relationships among surface owners, oil and gas lessors, oil and gas lessees, and neighboring owners; and government regulation.

6800. Public Lands. 3 (Max. 3). Examines the law governing management of the federal public lands/national parks, national forests, wildlife refuges, BLM lands, etc. Among other

laws, we study NEPA, General Mining Law of 1872, Mineral Leasing Act of 1920, National Forest Management Act of 1976, Taylor Grazing Act, Federal Land Policy and Management Act, Endangered Species Act, and Wilderness Act. In addition to examining Congress’ prescriptions for public land management and the constraints it has imposed on land managers, the course also explores how the public and politics influence public land policy and decision making.

6810. Real Estate Finance. 3 (Max. 3). Begins with some study of the law and practice relating to real estate transactions, deeds, and titles. The rest of the semester covers the law and practice relating to mortgages, foreclosure, and other financing issues in residential and commercial real estate transactions.

6830. Secured Transactions. 3 (Max. 3). Financial institutions and other businesses often take an interest in a debtor’s personal property (such as goods, equipment, inventory and accounts) to secure payment of a debt or performance of an obligation. Deals with the law governing security interests in personal property which is embodied primarily in Article 9 of the Uniform Commercial Code.

6840. Securities Regulation. 3 (Max. 3). Considers the responsibilities and liabilities of a company and various persons involved in the public offering of securities, including the filing of a registration statement, and other disclosure matters. Deals with the definition of the term “security” and possible exemptions for securities offerings. Covers securities fraud under SEC Rule 10b-5 including, inter alia, insider trading. Corporate disclosure requirements in connection with matters such as proxy rules and in other contexts are also considered. Some attention is given to disclosure requirements in connection with mergers and acquisitions, takeovers, and tender offers.

6850. Trial Practice. 3 (Max. 3). Trial Practice is a rigorous learn-by-doing course designed to build courtroom skills. Through a combination of exercises, lectures, demonstrations, drills and complete trials, students are prepared to advocate before judges and juries. The first half of the course focuses on basic examination and exhibit skills, including direct, cross, redirect, making and responding to objections, and the introduction and use of real and demonstrative evidence. In the sixth week, students conduct bench trials. The second half of the course builds on the basic skills and covers advanced ones, including examination of expert witnesses, opening statement, closing argument and voir dire. Jury trials are conducted in the final two weeks.

6860. Water Law and Policy. 3 (Max. 3).

A study of the allocation and reallocation of water resources with particular emphasis on prior appropriation systems in the Western United States. Riparian systems and ground-water management are also addressed, along with interstate conflicts, federal water rights, federal-state relations, and the effect of environmental laws on water allocation and the exercise of water rights.

6865. Natural Resources Law. 3 (Max. 3).

Comprehensive view of the general law governing natural and environmental resources. Students will learn to understand how our legal system has organized the various problems of allocation, use rights, duties and limitations, and governance, in the context of establishing rules governing human use of the earth's natural endowment. *Prerequisite:* completion of first year of law school.

6875. Hazardous Waste and Water Pollution Law. 3 (Max. 3).

Examines the Clean Water Act, Resource Conservation and Recovery Act, and the Comprehensive Environmental Response, Compensation, and Liability Act. These highly complex federal statutes, applicable nationwide either directly or via state-implemented programs, regulate pollution of water; govern industrial generation, handling, and cleanup of hazardous substances; and establish liability and enforcement standards.

6880. Criminal Adjudication. 3 (Max. 3).

A study of the post-investigative phase of the criminal process: from charging decisions through sentencing and appeals. Topics covered include: the decision to prosecute; bail and pretrial release; grand jury and preliminary hearing practice; jury-related issues, such as pretrial publicity, Batson, and deliberative secrecy; criminal discovery; the role and responsibilities of defense counsel and of the prosecutor; defendants' rights to presence, confrontation, and to present a defense case; verdicts; sentencing and appeals.

6885. Law Office Management. 1 (Max. 1).

This is a "how-to" course which introduces students to the law office as an operating business. This course covers various aspects of establishing and operating a law office, including: attorney timekeeping and client billing; establishing fees rates and fee agreements; revenue projections, record and file management and conflict management systems. *Prerequisites:* completion of the first year law school curriculum.

6890. Land Use Law. 3 (Max. 3). Deals primarily with public methods of making decisions concerning the use and development of land. Land use decisions range from the issuance of building permits or variances

to zoning to long-range planning. Examines tensions between private and public interests (private landowners, community residents, developers, business persons, and city/county officials) over the use of private property, the legal principles that inform the possible resolutions of these tensions and define governmental authority, and the implications of land use regulation for the exercise of other rights, such as free speech.

6910. Seminar. 1-2.

6915. Topics in Law. 1-3. Specific subject matter varies each year and between each section because the course is normally taught by a visiting faculty or by a law faculty member or interdisciplinary team who wish to present a special topic not able to be offered on a regular basis. Students should check class schedules for current offerings each semester. *Prerequisite:* completion of first year of law school; consent of instructor required for non-law students.

6920. Legal Skills and Problems. 1-2.

6925. Advanced Persuasive Writing. 3 (Max. 3). Art and science of written legal persuasion. Specifically, course explores the nature of legal persuasion from the standpoints of numerous disciplines, including classical rhetoric, psychology, literary theory, and morality theory, and based on these principles, covers specific strategies lawyers can use to make their writing more persuasive. *Prerequisites:* LAW 6160 and LAW 6260, and completion of first year of law school.

6930. Legal Clinic. 2-3 (Max. 6). Supervised clinical training in law office and court procedures. Clinical programs available are the Defender Aid Program, Legal Services Program, and the Prosecution Assistance Program. *Prerequisite:* Students must have completed first year of law school.

6931. Clinic: Civil Legal Services. 3 (Max. 12). The Civil Legal Services Clinic has provided legal assistance to Wyoming citizens for over 20 years. Students represent low-income and marginalized individuals across the state who could not otherwise afford legal representation. The CLSC's mission is to provide legal services in a broad range of general civil legal matters.

6932. Clinic: Defender Aid. 3 (Max. 12). Provides representation to indigent persons in Wyoming state and federal courts. We represent clients pending trial, on direct appeal from their convictions, and handle post-conviction matters in state and federal court.

6933. Clinic: Energy, Environment and Natural Resources. 3 (Max. 12). Fall: Classroom component of the Clinic will provide a practitioner's view of key aspects of federal court litigation practice in cases involving

natural resources issues. Spring: Clinic will provide an overview of the Wyoming Administrative Procedure Act and the Wyoming statutes that govern the regulation of energy production, environmental protection, and natural resources management in Wyoming.

6934. Clinic: Family and Child Advocacy. 3 (Max. 12). Handle a wide array of cases including divorce, child custody, domestic violence protection orders, stalking orders, guardian ad litem appointments in juvenile and domestic relations cases, and other family law matters. In addition, law students represent children or their parents in child abuse and neglect cases, termination of parental rights, children in need of supervision and delinquency actions.

6935. Contract Drafting. 3 (Max. 3). Covers fact investigation and the role of the lawyer in a transaction proposed by the client, including possible negotiations with other parties; drafting a contract in Plain English; and the ethical obligations of a transactional lawyer, through simulations and problem-solving exercises. *Prerequisite:* LAW 6110.

6936. Clinic: Prosecution Assistance. 3 (Max. 12). The program is heavily involved with the Wyoming Attorney General's office, usually in representing the state in criminal appeals before the Wyoming Supreme Court. In handling these appeals, students are responsible for the entire preparation of appellate briefs and the presentation of oral argument to the Supreme Court.

6937. Estate Planning Practicum. 3 (Max. 12). Provides students the opportunity to work with low-income clients around the State of Wyoming in a transactional law setting. Prepare wills, powers of attorney, advance health care directives, deeds, affidavits of distribution and other probate documents for small estates and will learn how to plan an estate for beneficiaries who are minors or who have special needs.

6940. Independent Study. 1-2 (Max. 4). Research and writing in specialized or advanced areas of the law. Students are to contact a professor that has a background or interest in the students' topic area to determine if the professor will supervise the Independent Study. Students receive one credit hour for 50 hours of work or 2 credit hours for 100 hours of work.

6941. Independent Study: Clinic. 1-4 (Max. 4). Course is meant to allow students to receive credit for continuing work completed in conjunction with a clinic or live practicum. To qualify for credits a student must have completed at least one semester in a clinic or live practicum.

6945. Workers Compensation Law. 3 (Max. 3). Addresses essential aspects of workers' compensation laws including extent of coverage, the various levels and varieties of benefits provided, and how claims are established and enforced. The course will also consider the interaction of state workers' compensation laws with other laws.

6950. Law Review. 1-3 (Max. 6). Intensive research, writing, and editing of case note or comment and cite-checking of articles for the Wyoming Law Review. Satisfactory/unsatisfactory only. Law Review membership is required. Credit may be received in the third year only. Maximum six hours in academic career.

6960. Legal Externships. 1-3 (Max. 6). The externship program provides second and third year students with an opportunity to learn through practice by working directly with attorneys or judges for academic credit. Externship placements are limited to judges, government agencies and nonprofit organizations, and must be pre-approved by the College of Law faculty.

6970. Legal Competitions. 1-3 (Max. 3).

6990. Advanced Topics. 3 (Max. 9).

6991. Advanced Water Law and Policy. 3. Research projects within the fields of domestic, international, or comparative water law and policy. Focuses on the elaborate body of laws governing allocation and management of water in and around the Colorado River Basin – i.e., the “Law of the River.” Explore the Law of the River’s historical evolution and current composition as well as cutting-edge policy issues currently facing it. Writing-intensive format satisfies the College of Law’s Advanced Writing Requirement. *Prerequisite:* C or better in LAW 6860.

6992. Advanced Oil and Gas Law. 3. Simulate the work of an oil and gas attorney. Explore oil and gas financing arrangements including the farmout, JOA, and productions sharing agreements, drilling and service agreements, downstream marketing and purchase agreements, conveyances of oil and gas real property interests, the purchase and sale of petroleum properties, oil and gas development on federal lands, and title examination. *Prerequisite:* C or better in LAW 6790.

6993. Advanced Trust and Estates. 3. Focuses on topics related to the law of trusts, including fiduciary administration, modification, termination, and alienation of trusts; charitable trusts; and issues of trust interpretation and construction. Other topics may be covered as time permits. *Prerequisite:* C or better in LAW 6330.

Armed Forces Services

LTC George R. Riggin, Commander, Army ROTC
LtCol. Anthony Kusek, Commander, Air Force ROTC

It has been the consistent policy of the university in cooperation with the federal government to make courses in military science and aerospace studies available on a voluntary basis to all qualified students.

Academic credits for Army and Air Force Reserve Officers' Training Corps (ROTC) are applied toward baccalaureate and graduate degrees in varying amounts depending upon the degree plan of the student and as determined by the college concerned.

Army ROTC

Department of Military Science
207 Wyoming Hall, (307) 766-3390
FAX: (307) 766-3383
Web site: www.uwyo.edu/armyrotc

Professor:

George (Ryan) Riggin, U.S. Army, Field Artillery; B.A. University of South Carolina 2002; MBA Liberty University 2014; Professor of Military Science 2020.

Lecturer:

JEREMIAH SCHUCHARDT, Master Sergeant, U.S. Army; Senior Military Instructor 2019.

The Department of Military Science - Army ROTC faculty is composed of U.S. Army officers and senior noncommissioned officers. These officers hold bachelors' and masters' degrees in a variety of fields. Noncommissioned officers hold associate degrees in a variety of fields. Officers' military education includes completion of the Officer Basic Course and the Officer Advanced Course. Several faculty are graduates of the Army's Command and General Staff College and have completed military specialty schools such as: Flight School, Ranger School, Airborne School, Air Assault School, Special Forces School, Jumpmaster Course, Special Operations Training and Language School.

General Information

Army ROTC is a program which offers qualified college students the opportunity to graduate as officers and serve tours in the U.S. Army, the Army National Guard or the U.S. Army Reserve.

The four-year program is divided into two parts called the basic course and the advanced course. The basic course, consisting of 8 credit

hours, is usually taken during the first two years of college. No military obligation is incurred by enrolling in the basic course.

The advanced course, usually taken during the junior and senior years or during graduate school, involves 19 credit hours of study and a five-week Leadership Development and Assessment Course during the summer. Advanced course students incur a military obligation, and they receive up to \$500.00 per month in tax-free subsistence throughout the academic year.

Army ROTC is not itself a major. Participants pursue the degree of their choice and take Army ROTC as an elective program. Those who complete the program may receive federal commissions from the President of the United States.

Army ROTC offers a military science minor. Effective with the Fall 2015 semester, the requirements for a minor in military science are as follows:

ARMY 3010.....	3
ARMY 3020.....	3
ARMY 3025.....	1
ARMY 3026.....	1
ARMY 3030.....	3
ARMY 4010.....	2
ARMY 4020.....	2
ARMY 4015.....	1
ARMY 4016.....	1
ARMY 4025.....	1
ARMY 4026.....	1
HIST 2020 or HP 4900.....	3
Total credit hours	22

The military science minor, encompassing 22 credit hours, will prepare selected students for commissioning and establish a sound basis for their future professional development.

To be eligible for a commission, U. S. citizens must meet prescribed physical, intellectual, and moral standards in addition to completing Army ROTC studies and successful completion of Professional Military Education (PME) courses. These PME courses include written communication skills, military history and computer literacy. A two-year option is available for sophomore and junior students, students with prior military service (see below), and those completing a masters program.

In the Army ROTC classroom the student is exposed to a wide variety of subjects designed to instill confidence, self-discipline, integrity and responsibility. Students gain an

appreciation for the role of national defense, and learn what a leader must be, know and do in order to gain the respect and support of their subordinates.

Skills learned in Army ROTC, including resource management, leadership and planning are valuable and complement any university major. Young commissioned officers returning to civilian sectors after military service find an abundance of career opportunities.

Uniforms, Pay and Allowances

All uniforms, books and other instructional materials required in Army ROTC are provided to basic and advance course students at no cost. The cadet uniform is the same as the U.S. Army uniform except for the distinctive ROTC insignia.

Advanced course participants are paid a tax-free subsistence allowance of up to \$500.00 per month during the school year. During the summer training period students receive pay, travel, rations, quarters, clothing, and medical and dental services.

Two Year ROTC Program

The two-year program is designed for community college graduates and university students of sophomore or junior standing who did not take Army ROTC during the first two years of school. The program may also apply to seniors and graduates who have at least two years remaining in post graduate study.

To enter the two-year program, students must first attend a paid 28-day internship during the summer or be a veteran who has graduated from advanced individual training.

Special Scholarship Program

Two-, three-, and four-year scholarships are offered by Army ROTC. These scholarships pay full tuition, laboratory fees and a \$1200 per year book fee. While on scholarship, the student receives up to \$500.00 a month during the school year. In addition to active duty scholarships, Army ROTC offers scholarships to students wishing to join the U.S. Army Reserve or Army National Guard upon commissioning. These reserve scholarships also pay full tuition, laboratory fees, book fees, and up to \$500.00 a month. Graduate students and undergraduate students are eligible to apply for the two- and three-year scholarships. These scholarships are awarded by the Professor of Military Science. Students do not have

to be enrolled in ROTC to apply for these scholarships. Certain restrictions apply. High school juniors and seniors seeking a four-year scholarship should contact the Professor of Military Science, Army ROTC, Dept. 3167, 1000 E. University Ave., Laramie, WY 82071. College students desiring a scholarship should contact the Professor of Military Science in 154 Wyoming Hall, (307) 766-3390.

Scholarships are offered to ROTC cadets from several military associations. The Reserve Officers Association (ROA), Association of the U.S. Army (AUSA), Cowboy Battalion Alumni Association (CBAA), the United Services Automobile Association (USAA) and First Command offer annual cash awards to ROTC cadets.

Room and board scholarships are available to students who enroll in Army ROTC. Scholarship awards are based on merit and the student's potential to become a commissioned officer. The number of scholarships and dollar amount vary dependent on funds available. Room and board scholarships may only be used in UW residence halls or university apartments.

Leadership Laboratory

Leadership laboratory provides instruction that complements the classroom. This time provides practical application on subject matter taught in class. Leadership and management dynamics are inherent in this practical application. All students enrolled in a military science course must enroll in the appropriate leadership laboratory unless consent is obtained from the Professor of Military Science. Training includes land navigation, first aid, communications, basic rifle marksmanship, drill and ceremonies, decision making, squad movement and problem solving. This instruction is cadet planned and presented with immediate instructor feedback. The goals of this period are to instill self-confidence, self-discipline and responsibility in each cadet.

Land navigation skills are practiced in a variety of terrain locations near campus. The training instills trust and confidence in the cadet's ability to accurately plot and follow a compass course. Communication, such as radio, telephone and interpersonal skills, are taught and practiced. Marksmanship is taught in the Half-Acre rifle range and on other ranges, weather permitting. Finally, drill and ceremonies teaches methods of organizing and moving groups of individuals in an orderly manner resulting in team building while establishing esprit de corps.

Veterans' Option

Veterans of active military service and members of the National Guard or U.S. Army Reserve may qualify to go directly into the advanced Army ROTC program if they will be an academic junior. In these cases, basic training fulfills the requirement of the first two years of ROTC (Basic Course). Academic freshmen and sophomores are not required to take basic course classes but are highly encouraged to do so. It is common for members of the National Guard to study to become commissioned officers via the ROTC program. The Simultaneous Membership Program (SMP) is a formalized program for advanced course Guard members and Reservists to combine their unit training with ROTC training. In many cases the SMP program will result in increased financial benefit to the individual.

Military Obligation

There is no military obligation for taking the basic course, freshman and sophomore years. When an individual starts the advanced course, he or she incurs an obligation. The nature of that obligation depends upon whether the individual elects to serve in the National Guard, the Army Reserve or the active Army, and whether the individual has an Army scholarship. Those who desire guard or reserve duty may contract specifically for that purpose. The guard and reserve obligation is six years of monthly training meetings and two years of inactive ready reserve (IRR). The active duty obligation is four years Active duty, and four years of inactive ready reserve (IRR).

Extracurricular Activities

Army ROTC offers a variety of activities which are designed to promote an interest in the military and provide relaxing, enjoyable leisure activities for cadets.

The Cowboy Battalion has its own Ranger Challenge team, which is a varsity-level team that competes with other universities in military skills such as orienteering and soldier skills. The battalion also has a cannon crew, mounted color guard, 10-miler team, Bataan Death March team, and participates in intramural sports.

The department periodically sponsors other activities such as rappelling demonstrations, ranger weekends, battlefield tours, leadership exercises and other adventure training, such as mountaineering, land navigation exercises, patrolling and wilderness survival.

Suggested Course Sequence

FRESHMAN YEAR: Fall		Hrs.
ARMY	1010	2
Lab (mandatory).....		0
PEAC	1272 (voluntary).....	1/2
ARMY	1011	1
ARMY	3060 (voluntary).....	1

FRESHMAN YEAR: Spring		Hrs.
ARMY	1020.....	2
Lab (mandatory).....		0
ARMY	1012	1

SOPHOMORE YEAR: Fall		Hrs.
ARMY	2010.....	2
Lab (mandatory).....		0
ARMY	2011	1
ARMY	2060 (voluntary).....	2
ARMY	3070 (voluntary).....	2

SOPHOMORE YEAR: Spring		Hrs.
ARMY	2020.....	2
Lab (mandatory).....		0
ARMY	2012.....	1
HIST	2020 (mandatory).....	3

JUNIOR YEAR: Fall		Hrs.
ARMY	3010.....	3
Lab (mandatory).....		0
ARMY	3011	1
ARMY	3025 (mandatory).....	1
ARMY	3070 (voluntary).....	2
ARMY	3015.....	1

JUNIOR YEAR: Spring		Hrs.
ARMY	3020.....	3
Lab (mandatory).....		0
ARMY	3012.....	1
ARMY	3026 (mandatory).....	1
ARMY	3016 (mandatory).....	1

SENIOR YEAR: Fall		Hrs.
ARMY	4010.....	2
Lab (mandatory).....		0
ARMY	4011	1
ARMY	3030 (voluntary).....	3
ARMY	4025 (mandatory).....	1
ARMY	4015 (mandatory).....	1
ARMY	4050 (voluntary).....	2
ARMY	3070 (voluntary).....	2

SENIOR YEAR: Spring		Hrs.
ARMY	4020.....	2
Lab (mandatory).....		0
ARMY	4012.....	1
ARMY	4026 (mandatory).....	1
ARMY	4016 (mandatory).....	1

Military Science (ARMY)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

1010. Introduction to Military Science. 2.

Encompasses dynamics of leadership applicable to all careers through instruction in Rifle Marksmanship; Land Navigation; Leadership Laboratory; Field Training Exercises; U.S. Army Customs, Courtesies and Career Opportunities and various leadership dimensions.

1011. Basic Military Conditioning Level I. 0.5.

This class will instruct and evaluate students in military conditioning. Physical fitness and leadership expectations in the physical conditioning class increase each semester and build toward peak physical performance prior to commissioning as an Army officer upon graduation. Military leaders have always recognized that the effectiveness of Soldiers depends largely on their physical condition. Full spectrum operations place a premium on the Soldier's strength, stamina, agility, resiliency, and coordination. Satisfactory/Unsatisfactory only.

1020. Dynamics of Leadership II. 2. Second semester of a one-year series. Continues ARMY 1010.

1021. Advanced Military Conditioning Level I. 0.5.

This class will instruct and evaluate students in military conditioning. Physical fitness and leadership expectations in the physical conditioning class increase each semester and build toward peak physical performance prior to commissioning as an Army officer upon graduation. Military leaders have always recognized that the effectiveness of Soldiers depends largely on their physical condition. Full spectrum operations place a premium on the Soldier's strength, stamina, agility, resiliency, and coordination. Satisfactory/Unsatisfactory only.

2010 [2030]. Leadership Skills and Management. 2.

Studies principles and theories of leadership and team dynamics. Develops student leadership potential through the study of the values and attributes of effective leaders. Students gain self-confidence through the application of principles and techniques of leadership in a military environment. *Prerequisite:* ARMY 1010, 1020 or consent of instructor.

2011. Basic Military Conditioning Level II. 0.5.

This class will instruct and evaluate students in military conditioning. Physical fitness and leadership expectations in the physical conditioning class increase each semester and build toward peak physical performance prior to commissioning as an Army officer

upon graduation. Military leaders have always recognized that the effectiveness of Soldiers depends largely on their physical condition. Full spectrum operations place a premium on the Soldier's strength, stamina, agility, resiliency, and coordination. Satisfactory/Unsatisfactory only.

2020 [2040]. Leadership Skills and Small Unit Management. 2.

Studies principles in small-unit management, tactics, operations and leadership. Develops students' self-confidence in their leadership ability through progressive application of knowledge, decision making, communication and control. *Prerequisite:* ARMY 2010 or consent of instructor.

2021. Advanced Military Conditioning Level II. 0.5.

This class will instruct and evaluate students in military conditioning. Physical fitness and leadership expectations in the physical conditioning class increase each semester and build toward peak physical performance prior to commissioning as an Army officer upon graduation. Military leaders have always recognized that the effectiveness of Soldiers depends largely on their physical condition. Full spectrum operations place a premium on the Soldier's strength, stamina, agility, resiliency, and coordination. Satisfactory/Unsatisfactory only.

2050. Internship: Leader's Training Course. 3.

A four week leadership practicum which orients students to U.S. Army, trains them in basic military skills, develops and evaluates their officer leadership potential, and qualifies them for enrollment in the ROTC Advanced Course Program. Increases confidence, self-discipline and decisiveness through physical and academic challenges. *Prerequisite:* sophomore standing or above.

2060. Competent and Confident Leadership. 2.

Interdisciplinary course whose aim is to encourage assessment of our obligations, commitments, and roles in society by inquiring into the nature of leadership and the responsibilities of both leaders and followers. Examines leadership traits that transcend the military aspect of leadership.

3010. Leadership and Tactics I. 3.

[O♦(none)] Studies leadership techniques and tactical operations at the small-unit level. Instruction covers the decision-making process, troop leading procedures, land navigation and operation orders. In-depth analysis of team/squad tactical procedures and techniques. Numerous student oral presentations and practical exercises. *Prerequisites:* ARMY 2010, 2020, basic camp or consent of department head.

3011. Basic Military Conditioning Level III. 0.5.

This class will instruct and evaluate students in military conditioning. Physical fitness and leadership expectations in the physical conditioning class increase each semester and build toward peak physical performance prior to commissioning as an Army officer upon graduation. Military leaders have always recognized that the effectiveness of Soldiers depends largely on their physical condition. Full spectrum operations place a premium on the Soldier's strength, stamina, agility, resiliency, and coordination. Satisfactory/Unsatisfactory only.

3015. Junior Staff Office Practicum I. 1.

This course provides a basic introduction to Army staff processes and the many diverse systems and processes within the Army that impact an officer's ability to successfully lead his/her unit. *Prerequisite:* This course requires concurrent enrollment in ARMY 3010.

3016. Junior Staff Office Practicum I. 1.

This course provides a basic introduction to Army staff processes and the many diverse systems and processes within the Army that impact an officer's ability to successfully lead his/her unit. *Prerequisite:* This course requires concurrent enrollment in ARMY 3020.

3020. Leadership and Tactics II. 3.

Studies platoon-level tactics and leadership techniques. Instruction covers the solving of complex tactical problems. Illustrates techniques for properly managing personnel, resources and time to accomplish organizational goals. Introduces Army staff functions and prepares students for successful completion of ARMY 3030. *Prerequisite:* ARMY 3010.

3021. Advanced Military Conditioning Level III. 0.5.

This class will instruct and evaluate students in military conditioning. Physical fitness and leadership expectations in the physical conditioning class increase each semester and build toward peak physical performance prior to commissioning as an Army officer upon graduation. Military leaders have always recognized that the effectiveness of Soldiers depends largely on their physical condition. Full spectrum operations place a premium on the Soldier's strength, stamina, agility, resiliency, and coordination. Satisfactory/Unsatisfactory only.

3025. Conduct of Training. 1.

Introduces the Army's system of conducting training exercises. Covers prerequisite training, pre-execution checks, officer/NCO responsibilities, training presentation techniques, sustainment training and training assessment. *Prerequisite:* consent of instructor.

3026. Assessment of Training. 1. Introduces the Army's system of training assessment. Covers formal and informal after-action reviews (AARs); preparation for, conduct of, and goals of an AAR; and writing of Army after-action reports. *Prerequisite:* consent of instructor.

3030. Practicum in Leadership. 3. Encompasses Leadership Development and Assessment Course, a five week test of the cadet's leadership ability. Each cadet is evaluated in ten different positions. Positions include both garrison and tactical situations. Each position requires the cadet to plan, implement and execute a wide variety of tasks. The cadet must control all personnel under this command. The cadet is extensively evaluated by cadre Tactical Officer/Non-commissioned Officer on twelve leadership dimensions. Successful completion of the Leadership Development and Assessment course is required for commissioning. *Prerequisites:* successful completion of ARMY 3010 and 3020.

3050. Army ROTC Nurse Summer Training Program. 3. Allows Army ROTC nursing cadets to obtain college credit for nursing experience gained in an army hospital during nurse summer training program. Students practice military skills, leadership, clinical nursing, administrative and interpersonal skills. *Prerequisites:* ARMY 3010, 3020.

3060. Military Skills Practicum: Ranger Challenge. 1-4 (Max. 4). Encompasses training and intercollegiate competition in fundamental military skills. Students learn and compete in areas of physical conditioning training, land navigation, rifle marksmanship, rope bridging and other skills practiced during small-unit military operations. *Prerequisite:* consent of department or instructor.

3070. Cadet Professional Development Practicum. 2. Consists of attendance as an Army ROTC cadet at an Army specialty producing school including Airborne, Air Assault, Northern Warfare School or Mountain Warfare School. Offered for S/U grade only. *Prerequisites:* ARMY 1010, 1020, 2010 and 2020 and/or consent of department head.

4010 [4030]. Dynamics of the Military Organization I. 2. Studies and analyzes organization, resources and functions of military staff. Reviews formal staff problem-solving procedures, including student effective writing and briefing presentations. Introduces ethics and the military profession. *Prerequisites:* ARMY 3010, 3020 or consent of department head.

4011. Basic Military Conditioning Level IV. 0.5. This class will instruct and evaluate students in military conditioning. Physical fitness and leadership expectations in the physical conditioning class increase each semester and build toward peak physical performance prior to commissioning as an Army officer upon graduation. Military leaders have always recognized that the effectiveness of Soldiers depends largely on their physical condition. Full spectrum operations place a premium on the Soldier's strength, stamina, agility, resiliency, and coordination. Satisfactory/Unsatisfactory only.

4012. Basic Military Conditioning Level V. 0.5. This class will instruct and evaluate students in military conditioning. Physical fitness and leadership expectations in the physical conditioning class increase each semester and build toward peak physical performance prior to commissioning as an Army officer upon graduation. Military leaders have always recognized that the effectiveness of Soldiers depends largely on their physical condition. Full spectrum operations place a premium on the Soldier's strength, stamina, agility, resiliency, and coordination. Satisfactory/Unsatisfactory only.

4015. Staff Officer Practicum I. 1. Gives students practical experience in serving on an Army staff. Under supervision of an Army ROTC cadre member, students undergo training and conduct practical exercises in one of the following specialties: command and control, operations, personnel or logistics. *Prerequisite:* concurrent enrollment in ARMY 4010.

4016. Staff Officer Practicum II. 1. Gives students experience in serving on an Army staff. Under the supervision of an Army ROTC Cadre member, students undergo training and conduct practical exercises in one of the following specialties: command and control, operations, personnel or logistics. *Prerequisite:* concurrent enrollment in ARMY 4020.

4020 [4040]. Dynamics of the Military Organization II. 2. Introduces military law; planning and management of personal affairs; Army transportation, logistics and personnel management systems. Studies officer/NCO relations. Includes student writing and briefing presentations on assigned topics. *Prerequisite:* ARMY 4010 or consent of department head.

4021. Advanced Military Conditioning Level IV. 0.5. This class will instruct and evaluate students in military conditioning. Physical fitness and leadership expectations in the physical conditioning class increase each semester and build toward peak physical performance prior to commissioning as an

Army officer upon graduation. Military leaders have always recognized that the effectiveness of Soldiers depends largely on their physical condition. Full spectrum operations place a premium on the Soldier's strength, stamina, agility, resiliency, and coordination. Satisfactory/Unsatisfactory only.

4022. Advanced Military Conditioning Level V. 0.5. This class will instruct and evaluate students in military conditioning. Physical fitness and leadership expectations in the physical conditioning class increase each semester and build toward peak physical performance prior to commissioning as an Army officer upon graduation. Military leaders have always recognized that the effectiveness of Soldiers depends largely on their physical condition. Full spectrum operations place a premium on the Soldier's strength, stamina, agility, resiliency, and coordination. Satisfactory/Unsatisfactory only.

4025. Principles of Training Management. 1. Introduces students to the Army's system of training management. Covers principles and philosophy of training, training guidance, training cycles, soldiers/leader tasks, techniques for collective and multi-echelon training, as well as procedures for short-term planning. *Prerequisite:* consent of instructor.

4026. Preparation of Training. 1. Introduces the Army's system of training preparation. Covers short-range training plans, training meetings, development of timelines, publishing of training schedules, training and evaluation outlines, as well as rehearsals. *Prerequisite:* consent of instructor.

4050. Management Internship: Cadet Troop Leadership Training. 2. Conducted at an active Army installation. Students (under supervision) assume duties of and function as a junior commissioned officer for three-week period. Written evaluation of student's performance is returned. Offered for S/U grade only. *Prerequisites:* ARMY 3010, 3020 and consent of department head.

4975. Military Science Independent Study. 1 (Max. 2). A continuation of ARMY 4010 and 4020. Projects and events are set at the discretion of the professor and subject to change. *Prerequisites:* ARMY 4010 and 4020.

4976. Advanced Military Science Independent Study. 1. The purpose of this course is to instill leadership ability, technical and tactical skills, and professional values necessary for your completion of the UW Military Science program. Introducing students to small unit tactics, leadership positions, and developing the student's ability to make informed decisions in any military environment.

Air Force ROTC

Department of Aerospace Studies
110 Wyoming Hall, (307) 766-2338
FAX: (307) 766-2357
Web site: www.uwo.edu/airrotc

Professor:

ANTHONY KUSEK, Lt. Colonel, U.S. Air Force; B.S. Parks College 1995; M.A. Webster University 2007; Professor of Aerospace Studies 2019.

RICHARD LANDSVERK, Major, U.S. Air Force; B.S. Thomas Edison State College 2008; M.A. Bellevue University 2012; Professor of Aerospace Studies 2019.

SAMUEL R. SHEARER, Lt. Colonel, U.S. Air Force; B.S. University of Utah 1996; M.S. Troy State University 2003; M.A. Naval Postgraduate School 2004; Ph.D. 2013; Professor of Aerospace Studies 2016.

Air Force Reserve Officers' Training Corps (AFROTC) provides University of Wyoming students a path toward earning a commission as an officer in the United States Air Force. The curriculum provides college students a solid understanding of the leadership and military fundamentals an Air Force officer requires. AFROTC cadets supplement their normal university coursework with studies in Air Force fundamentals, history, leadership, and national security affairs. In addition, cadets have the opportunity to learn about various careers in the Air Force through their studies, guest lectures, base visits, and other military training opportunities. While enrolled in AFROTC, the Air Force provides uniforms, AFROTC textbooks, and the necessary Air Force equipment. Upon successful completion of the program and earning their bachelor's degree, cadets are commissioned as 2nd lieutenants in the U.S. Air Force.

Application and enrollment in the program is voluntary. Students should simply register for the appropriate Air Force (AIR) courses. In addition, prospective cadets will need to complete an application package upon arrival at the detachment in order to ensure minimum qualifications for military service. Contact the AFROTC Department for additional details or with any questions regarding registration. All university students, both male and female, are eligible to apply for admission in the program.

Four-Year Program

The four-year program is divided into two phases. The first two years comprise the General Military Course (GMC) consisting of one class period (1 hour) per week in the classroom

and one class period (2 hours) per week in leadership laboratory. The GMC is a prerequisite for continuation in the Professional Officer Course (POC), the last two years in the program. Other prerequisites include passing the Air Force Officer Qualifying Test (AFOQT), maintaining at least a minimum grade point average of 2.0 (GMC) and 2.5 (POC), having the physical qualifications for an Air Force commission, and participating in a four-week field training session. The advanced course consists of one class period (3 hours) per week in the classroom and one class period (2 hours) per week in leadership laboratory.

Three-Year Program

Students may enroll in ROTC on a three or three and one-half year program where the GMC component is shorter. To complete the GMC requirements, the student must simultaneously enroll in AIR 1000 and AIR 2000 courses to complete all four academic terms of the GMC program. After successfully completing the GMC program and Field Training, students may enter the two-year POC program. This program is especially suitable for sophomores and junior college transfers. Students that participated in high school Junior ROTC, or have prior-enlisted service, can apply documented participation toward a portion of the GMC requirement.

Leadership Laboratory

The concept of leadership laboratory is to provide leadership training experiences which will improve a cadet's ability to perform as a USAF officer. Leadership laboratory is largely cadet planned and directed.

Field Training

Field training is a four-week program conducted in residence at an Air Force base during the summer.

While at field training, each cadet is provided subsistence, uniforms/equipment, and receives approximately \$28.00/day plus reimbursement for travel to and from the field training base.

Financial Benefits

Freshmen and Sophomores on AFROTC scholarships receive \$300 and \$350, per month, respectively. Juniors enrolled in the Professional Officers Course receive \$450 per month and seniors \$500 per month tax-free during the school year for subsistence. Uniforms, required texts and all necessary Air Force equipment are furnished by the government. In addition, all POC and scholarship cadets are

allowed to travel anywhere in the continental United States on military aircraft (on a space available basis).

Special Scholarship Program

Two-, three- and four-year scholarships are offered by AFROTC on a competitive basis. These scholarships pay for a \$900 book allowance per year, tuition (amount dependent on type of scholarship awarded), fees and other required expenses except room and board. The university and the State of Wyoming offer additional room and board funding to Air Force ROTC cadets (who have or have not been awarded an Air Force ROTC scholarship) and reside in university housing. High School seniors seeking a four-year scholarship should contact their high school counselors or the Recruiting Flight Commander, AFROTC Detachment 940, Dept. 3005, 1000 E. University Avenue, Laramie, WY 82071; telephone (307)766-3710; email at airforce.rotc@uwo.edu, early in the fall of their senior year. Sophomore or transfer students interested in competing for a scholarship should contact the Recruiting Flight Commander before the fall semester prior to junior standing.

Military Obligation

Students enrolling in the first two years of the AFROTC Program (the General Military Course) are not obligated to military service of any kind, unless on an Air Force scholarship their sophomore year. Cadets accepting an AFROTC scholarship and those entering the Professional Officer Course become members of the inactive reserve of the United States Air Force. Upon being commissioned a Second Lieutenant in the Air Force, graduates in non-flying career fields agree to serve four years on active duty; pilot candidates agree to serve on active duty for 10 years after completion of flight training; RPA, navigator, and air battle manager candidates agree to serve on active duty for six years after completion of their respective training.

Extracurricular Activities

To familiarize students with Air Force life and social customs, the AFROTC Program offers on a voluntary basis a wide range of extracurricular activities. Civil Air Patrol gives cadets an opportunity to experience flying first hand with a trained instructor pilot. The Arnold Air Society, a national professional honorary society, is a service organization active on campus. The color guard supports various university and local activities. Visits to Air Force bases across the nation provide insight into the function of Air Force opera-

tional units. Throughout the year, AFROTC teams participate in the university intramural sports program, while cadet-sponsored social events build the spirit of comradeship inherent in military life.

Aerospace Studies Minor

Air Force ROTC offers an Aerospace Studies minor. For the Aerospace Studies minor, the student must complete the core AFROTC program plus: 1) 3 credit hours in any Management (MGT) course in the current UW catalog and 3 credit hours in one Political Science (POLS) course listed below, or 2) 6 credit hours of Political Science courses listed below.

POLS 1200, 2200, 2290, 2300, 2310, 3220, 3270, 3300, 4220, 4230, 4255, 4300, 4340, 4360, 4870

The 24 credit hours required to accomplish the Aerospace Studies minor will effectively compliment many majors, provide a sound basis for future professional development, and increase the career opportunities of a UW graduate.

Air Force (AIR)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

1000. Leadership Laboratory. 0. The concept of leadership laboratory is to provide leadership training experiences which will improve a cadet's ability to perform as a USAF officer. Leadership laboratory is largely cadet planned and directed. All cadets must enroll in leadership laboratory. *Prerequisites:* none.

1010. Heritage and Values of the Air Force I. 1-1/2. A survey course designed to introduce students to the United States Air Force and provides an overview of the basic characteristics, missions, and organization of the Air Force.

1020. Heritage and Values of the Air Force II. 1-1/2. Continues AIR 1010. *Prerequisite:* AIR 1010 or consent of instructor.

2010. Team and Leadership Fundamentals I. 1-1/2. Focuses on laying the foundation for teams and leadership. The topics include skills that will allow cadets to improve their leadership on a personal level and within a team. The courses will prepare cadets for their field training experience where they will be able to put the concepts learned into practice. The purpose is to instill a leadership mindset and to motivate sophomore students to transition from AFROTC cadet to AFROTC officer candidate. *Prerequisites:* AIR 1010 and AIR 1020 or consent of instructor.

2020. Team and Leadership Fundamentals II. 1-1/2. Continues AIR 2010. *Prerequisites:* AIR 1010, AIR 1020, and AIR 2010 or consent of instructor.

3010 [4010]. Leading People/Effective Communication I. 3. Teaches cadets advanced skills and knowledge in management and leadership. Special emphasis is placed on enhancing leadership skills and communication. Cadets have an opportunity to try out these leadership and management techniques in a supervised environment as juniors and seniors. *Prerequisite:* AIR 1010, 1020, 2010, and 2020 or consent of instructor.

3020 [4020]. Leading People/Effective Communication II. 3. [CS♦(none)] Continues AIR 3010. *Prerequisite:* AIR 1010, 1020, 2010, 2020, 3010 or consent of instructor.

4010 [4050]. National Security Affairs/Preparation for Active Duty I. 3. [G♦(none)] Designed for college seniors and gives them the foundation to understand their role as military officers in American society. It is an overview of the complex social and political issues facing the military profession and requires a measure of sophistication commensurate with the senior college level. The final semester provides information that will prepare the cadets for Active Duty. *Prerequisite:* AIR 1010, 1020, 2010, 2020, 3010, 3020, or consent of instructor.

4020 [4060]. National Security Affairs/Preparation for Active Duty II. 3. Continues AIR 4010. *Prerequisite:* AIR 1010, 1020, 2010, 2020, 3010, 3020, 4010 or consent of instructor.

Bachelor of Applied Science

160 Agriculture Building

Awarded by the College of Agriculture and Natural Resources

Phone: (307)766-4034 Fax: (307)766-4030; Web site: www.uwyo.edu/basa/

Organizations need leaders at all levels who can effectively understand the environment and society in which they operate; analyze situations and solve problems; supervise and manage, interact and communicate appropriately within and outside the organization; anticipate changes; and plan for the future. The Bachelor of Applied Science degree (B.A.S.) is designed for individuals with a completed Associate of Applied Science, Associate of Science, Associate of Business or an Associate of Arts degree at a Wyoming Community College (or an equivalent degree at another accredited institution) and who need or desire the additional breadth in skills, knowledge and professional expertise to enhance their capabilities in their own careers and in the organizations in which they work.

The fundamental philosophy of the B.A.S. degree is that the student must complete the general education (University Studies Program - USP) requirements expected of all UW bachelor's degrees and must engage in upper-division coursework sufficient to provide focus and depth of learning. Following this philosophy, the B.A.S. has four basic components. These components are university studies, career specialty, professional concentration, and electives. The fundamental elements of the baccalaureate degree are provided by the general education core (USP) and the upper division professional concentration. At the end of the program, students are expected to meet the following Student Learning Outcomes:

- 1) to develop proficiency in accessing, evaluating and utilizing information, ideas, and data;
- 2) to develop proficiency in communicating information and ideas effectively and responsibly;
- 3) to gain an appreciation for leadership development as a tool for individual, organization and community problem solving;
- 4) to demonstrate an understanding of organizational design, behavior, ethical practices, and effective managerial and supervisory practices;
- 5) to gain an understanding of social, cultural, economic and environmental contexts essential for effective leadership and the management of change.

The University Studies Program (USP 2015) consists of a minimum of 27 credit hours as adopted by the UW faculty, and the Articulation Agreement between UW and the Wyoming Community Colleges. Students with an Associate of Applied Science degree from a Wyoming community college will normally matriculate with 15-20 hours of credit that count toward this component. The remainder may be required as part of a UW student's coursework, including the Professional Concentration or Electives coursework.

The Career Specialty Component is fulfilled with the Associate of Applied Science, the Associate of Science, or Associate of Arts degrees. This component will consist of a minimum of 40 credit hours in the major.

The Professional Concentration Component is the advanced component of the program and the courses are selected by the student and the advisor. All students are required to take a range of courses from the prescribed set of areas of concentration within this component in order to provide them with the breadth and depth of learning necessary for a baccalaureate degree. This component will consist of 36-40 upper division or articulated equivalent credit hours. Note: Within the Professional Concentration, students have a choice between two Organizational Leadership areas. Option A focuses on Community Leadership; Option B focuses on Business Leadership.

The Elective Component will consist of the number of credit hours needed (after completing the other three components) to complete the degree components. A minimum of 120 hours is required for the B.A.S.

All University of Wyoming Students must earn a total of 42 upper division hours (at least 30 hours taken from UW), to earn their degree. Students in the B.A.S. program must earn a "C" in all courses on the B.A.S. checklist. Failure to do so will require repeating the course. Per university regulations, students may only attempt a course three times; an "F" or "W" count as attempts.

Application Process

All students must apply to the Bachelor of Applied Science program, including those who would like to change their major to the B.A.S. in Organizational Leadership. Students cannot just fill out a change of major form and have Admissions change their status.

These are the steps for application:

1. Apply to the University of Wyoming through Admissions, declaring the Bachelor of Applied Science in Organizational Leadership.
2. Have official transcripts from all institutions attended sent to Admissions.
3. Email BAS@uwyo.edu when you have received your acceptance to UW. Include your W# in the message. We can then track your files to evaluate them for the BAS program.
4. Students will receive a letter telling the application decision. If a student is denied admission to the BAS, an explanation for the denial will be provided. If accepted, the student will be given information for how to work with the program advisor, Rosalind Grenfell (rgrenfel@uwyo.edu), to enroll in classes.

Organizational Leadership Major

This program is available by distance delivery only. Entry into the program requires an application process. Students must apply for admission to UW first. Official transcripts from all institutions attended must be submitted to UW Admissions. Entry into this program requires an existing associate's degree. Transcripts will not be analyzed prior to application.

All students pursuing a bachelor's of applied science degree in Organizational Leadership are required to complete: a) University Studies Program (USP) requirements and b) courses within the program checklist. While students may move through the program at a pace that works for them, the checklist will illustrate a path for those who wish to complete the degree in two years. Students must complete coursework from Option A or Option B as part of their degree requirements.

The University Studies Program (USP) ensures that each student's program includes the elements essential to a lifetime of personal and professional growth: habits of mind, practices of active citizenship, and development of intellectual skills. The USP program requires students to develop skills that include the ability to express oneself in speech and writing; to locate, evaluate and effectively use information; and to examine problems from quanti-

tative, qualitative, and scientific perspectives. The USP requirements will be approximately 30 credit hours of your overall degree program.

All courses within the Bachelor of Applied Science must be completed with a grade of C or better. If you do not pass the course with a grade of C or better after three attempts you will be dismissed from your organizational leadership major.

The requirements for your program are listed in this check sheet. It is important to understand course sequencing (when courses are offered) and prerequisites (other courses that must be taken first). Each student has an assigned advisor, Rosalind Grenfell (rgrenfel@uwo.edu). You will be advised each semester. It is important that you work closely with your advisor to plan your course schedule.

University Requirement – All degrees at the University of Wyoming require 42 upper-division credit hours (3000+).

Residency Requirement – All degrees must include a minimum of 30 credit hours from UW.

I. Major Requirements

JUNIOR YEAR: Fall	Hrs.
AGRI 3000	3
FCSC 3110 or AGRI 4350.....	3
Upper division elective	3
*one course from Option A or Option B	3
Elective or remaining USP course	3
Total	15

JUNIOR YEAR: Spring	Hrs.
*one course from Option A or Option B	3
Contemporary Society course	3
Approved Career Elective.....	3
COJO 3010 or COJO 3190	3
Elective or remaining USP course	3
Total	15

SENIOR YEAR: Fall	Hrs.
AGRI 4600.....	3
*one course from Option A or Option B	3
Elective or remaining USP course	3
Approved Career Elective.....	3
Upper division elective	3
Total	15

SENIOR YEAR: Spring	Hrs.
*one course from Option A or Option B	3
Elective	3
AGRI 4960 or 3 credits of approved career electives	6
Contemporary Society course	3
Total Hrs.	15
Total Credit Hours	60

II. University Studies Program

Core Components	Hrs.
Critical and Creative Thinking (FYS)	3
Communication I (COM1).....	3
Quantitative Reasoning (Q)	3
Science (PN)	6
Human Culture (H)	6
U.S. and Wyoming Constitutions (V).....	3

Embeddable Components	Hrs.
Communication 2 and 3 (COM2 and COM3)	6
Total USP Hrs.	30
Total hours for degree:	120

Degrees Offered

The Haub School offers undergraduate degrees, several campus-wide concurrent academic programs, and a graduate degree in partnership with the College of Law:

Bachelor of Science in Environmental Systems Science (for baccalaureate students)

Bachelor of Science in Environment & Natural Resources (for baccalaureate students, required second major)

Environment & Natural Resources concurrent major (for baccalaureate or master's students earning a degree from UW)

Bachelor of Science in Outdoor Recreation and Tourism Management (for baccalaureate students)

Environment & Natural Resources minor (for baccalaureate, master's, and doctoral students)

Sustainability minor (for baccalaureate students)

Outdoor Leadership minor (for baccalaureate students)

Master of Arts in Environment & Natural Resources (J.D./M.A. for law students only)

Collaborative Practice minor (for master's and doctoral students)

Program Admission

Undergraduate students will apply for admission to the University of Wyoming, and then declare a major or minor within the Haub School at any point during their course of study. To declare a major or minor, students must meet with a Haub School academic advisor.

Graduate students interested in the concurrent major or minor in Environment & Natural Resources (ENR) will apply for admission to a primary degree program at the University of Wyoming. Once accepted to their primary graduate program, students must complete an additional online process to confirm their enrollment in the ENR major or minor. During the Haub School admission process, students will select a Haub School faculty mentor and submit a one-page Statement of Purpose. Current application requirements available online.

Applicants to the J.D./M.A. in ENR must apply to both the College of Law and the Haub School. Admission to the joint degree program

is contingent on acceptance to the College of Law. Current application requirements are available online.

More information, including complete curricula for each academic offering, is available from the Haub School. Students enrolled in multiple Haub School programs must earn 12 credits unique to each program.

Students must earn a C or better in all courses fulfilling program requirements - including Haub School U.S. Diversity and Global Awareness courses, and degree, major, and/or minor courses.

Haub School Requirements (for undergraduate students earning their primary degree from the Haub School)

Undergraduate students earning a B.S. in Environmental Systems Science, a B.S. in Outdoor Recreation and Tourism Management, and/or a B.S. in Environment and Natural Resources (plus a concurrent major in another field) must fulfill two courses (totaling 6 credit hours) of Haub School Requirements. An undergraduate degree from the Haub School of Environment and Natural Resources indicates that students are liberally educated, with the foundational skills and knowledge to approach local and global contexts from multiple perspectives. The approved courses for the following requirements are searchable within WyoRecords under the Browse Classes feature. Students must earn a C or better in all core curricula courses.

1. U.S. Diversity (ASD). This requirement allows students to explore the complexity of cultural identities in the U.S. and interdependence of the cultures. Students will gain an understanding of the influences of categories such as race, class, ethnicity, gender, disability, sexual orientation, religion, and age on American behaviors, institutions, values, and beliefs.
2. Global Awareness (ASG). Because citizens ever more frequently encounter behaviors and practices based on beliefs, conditions, and assumptions different from their own, they need to understand the nature and function of culture. Our students should have an awareness of the multiple links that affect the living conditions and range of action of peoples of the world, including international systems of

commerce, art, science, sustainability, technology, politics, communication, belief, and justice, among others.

Bachelor of Science in Environmental Systems Science

Environmental Systems Science (ESS) is an interdisciplinary undergraduate degree in environmental science, focusing on the interactions between the various components of Earth and environmental systems, including the biosphere, lithosphere, atmosphere, and anthroposphere.

Students earning a B.S. in Environmental Systems Science will

1. demonstrate a knowledge of interdisciplinary perspective and integrative thinking,
 - a. understand physical and biological components of environmental systems, including the human component;
2. design, conduct, and interpret scientific investigations,
 - a. understand the ethics of scientific investigation,
 - b. demonstrate proficiency in data collection, statistical analysis, and use of information technology tools and modeling;
3. apply systems concepts to problems concerning environmental systems and their components, and construct conceptual and quantitative systems models;
4. examine spatial, temporal, and spatial-temporal patterns in environmental systems, and use information technology tools to depict, project, and communicate such patterns.

ESS Program Requirements

Students earning a B.S. degree in ESS complete coursework including:

23+ credit hours of Foundations courses:

1. Intro to Systems Science: ESS 1000
2. Foundation of Biological Sciences (choose one course): AECL 1000, ENR 1200, or LIFE 1010
3. Foundation of Earth Sciences (choose one course): ENR/GEOL 1500, GEOG 1010, or GEOL 1100
4. Foundation of Physical Sciences (complete all courses): CHEM 1020, PHYS 1110, and ESS/GEOL 2000

18+ credit hours of Spheres courses:

1. Anthrosphere (choose one course): ENR/AMST 4030, ENR/ANTH 4310, ENR/GEOG 4040, ENR/HIST 4412, ENR/SOC 3950, GEOG/NAIS 3400, GEOG 3550, or GEOL 3650
2. Atmosphere (choose one course): ATSC 2100, ATSC 2200, ERS 3010, ENR/GEOG/GEOL 3450, or GEOG/GEOL 4442
3. Biosphere (choose one course): ENR 4010, 4011, and 4012 (must complete all three courses), ENR/ZOO 2450, GEOG 4460, LIFE 2022, LIFE 2023, LIFE 3400, REWM 2000, REWM 4200, or REWM 4400
4. Lithosphere – Environmental Change (choose one course): ENR/SOIL 3130, ENR/CE 4430, ESS/GEOG/GEOL 3480, or GEOL 3500
5. Lithosphere – Hydrology & Surface Processes (choose one course): ENR/REWM 4285, GEOG 3010, GEOL 3400, REWM 4700, or REWM 4710

15+ credit hours of Skills & Tools courses:

1. Statistics (choose one course): STAT 2050 or STAT 2070
2. Data Analysis (choose one course): ENR/GEOL 4525, GEOL 3250, STAT 3050, or ZOO 4400
3. GIS/Remote Sensing (choose one course): GIST 1100, GIST 2100, GIST 2150, GIST 2160, GIST 3111, or GIST/RNEW 4130
4. Applied Experience (1 credit): ESS 4970
5. Capstone: ESS 4950

18+ credit hours in an approved minor* or concurrent major as an area of specialization: Agroecology, Anthropology, Astronomy, Biology, Botany, Chemistry, Environment & Natural Resources, Geography, Geology, Insect Biology, Land Surveying, Paleoenvironmental Studies, Physics, Rangeland Ecology & Watershed Management, Reclamation & Restoration Ecology, Soil Science, Statistics, Sustainability, Wildlife & Fisheries Biology & Management, or Zoology

6+ credit hours of Haub School Requirements courses: U.S. Diversity (choose one) and Global Awareness (choose one)

**other options available; subject to advisor approval*

Bachelor of Science in Environment & Natural Resources or Undergraduate Major in ENR

The primary goal of ENR studies is to gain depth and breadth of understanding in interdisciplinary studies that address complex ENR issues and to integrate that understanding with the student’s other fields of study.

Students can choose to pursue:

- a concurrent major in ENR, earned alongside an approved baccalaureate degree in any other discipline, or
- B.S. in ENR, earned alongside an additional major in any other discipline.

The ENR curriculum is designed to prepare students to demonstrate learning in six key areas:

1. Specialization & Integration – Students will complement their disciplinary depth with broad exposure to ENR-related disciplines and approaches.
2. Spatial & Temporal Perspectives – Students will understand the temporal and spatial characteristics of ENR challenges.
3. Policy – Students will recognize the content and implications of past and current ENR policies.
4. Cultures & Values – Students will appreciate the diversity of ENR perspectives and experiences, including the role of personal and collective value systems and structural inequalities in shaping those systems.
5. Complexity, Risk, & Uncertainty – Students will understand that ENR problems inherently involve complexity, risk, and uncertainty.
6. Professional & Academic Skills – Students will acquire specific skills necessary to succeed in a range of ENR professions and/or graduate and professional school, especially proficiency in written and oral communication, applied problem solving, and collaboration.

All undergraduate students in ENR complete their coursework in conjunction with another major in any discipline. Students must complete 35+ hours of coursework in ENR, including:

15+ credit hours of ENR Core courses:

1. Foundations of Environmental Science (choose one course): ENR 1200, ENR/GEOL 1500

2. Environment & Society: ENR 2000
3. Approaches to Problem Solving: ENR 3000
4. Environmental Assessment: ENR 4900
5. Applied Experience (2 credits): ENR 4970

21+ credit hours of ENR Disciplines courses:

1. Cultures & Values (choose one course): ENR/AMST 3050, ENR/AMST 4030, ENR/ANTH 4310, ENR/HIST 4412, ENR/HIST 4475, ENR/PHIL 2330, ENR/POLS 3620, ENR/SOC 3950, GEOG/NAIS 3400, GEOG 4570, HLED 4020, ORTM 4901, or WMST 4450
2. Economics (choose one course): AGECE 4720, ECON 2400, ENR/AGECE 3750, ERS 3400, or GEOG 3050
3. Environmental Management (choose one course): ENR/AMST 4800, ENR/CE 4430, ENR/ZOO 2450, ERS 3010, ENR/GEOG 4040, GEOG 4080, GEOL 3400, GEOL 3650, REWM 2000, or REWM 4700
4. Data Analysis (choose one course): ENR/AGECE 4550, ENR/GEOL 4525, GIST 2100, GIST 2150, GIST 2160, GIST 3111, GIST/RNEW 4130 or STAT 3050
5. Physical & Natural Science (choose one course): ATSC 2100, ATSC 2200, ENR 4010, 4011, and 4012 (must complete all three courses), ENR/REWM 3100, ENR/REWM 4285, ENR/SOIL 3130, GEOG 4460, ENR/GEOG/GEOL 3450, ESS/GEOG/GEOL 3480, GEOG/GEOL 4442, LIFE 3400, or REWM 4440
6. Policy (choose one course): ENR 3300, ENR 4750, ENR/GEOG/POLS 4051, ENR/GEOG/POLS 4052, INST/POLS 4455, or POLS 4475/INST 4990
7. ENR Electives (choose one course; three credits required): ENR 1300, ENR 2800, ENR 3900, ENR 4450, ENR 4600, ENR 4890, or ENR 4960

An approved major in any discipline

Note: students earning a B.S. in ENR with their degree awarded from the Haub School must additionally complete 6 credit hours of Haub School Requirements (U.S. Diversity and Global Awareness).

Bachelor of Science in Outdoor Recreation and Tourism Management

A B.S. in Outdoor Recreation and Tourism Management (ORTM) emphasizes stewardship and conservation of natural resources, tourism and outdoor recreation theories and best practices, entrepreneurial and business management strategies, creating outstanding visitor experiences, and broad understanding of cultural and natural resources. Students choose one of five different concentrations.

Students earning a degree in ORTM will be expected to demonstrate learning in six key areas:

1. Leadership
 - a. competency in leading and building diverse, collaborative teams;
 - b. application and evaluation of ethical, resourceful leadership principles to challenges and solutions within the ORTM industry.
2. Professional Practice
 - a. ability to apply and critically evaluate practical, creative, ethical, and theoretical frameworks in diverse and complex professional circumstances.
3. Communication
 - a. ability to manage dynamic relationships and demonstrate best practices in communication.
4. Nimble and Creative Thinking
 - a. ability to strategically design, implement, and evaluate sustainable and emergent services, experiences, and opportunities.
5. Trans-disciplinarity
 - a. synthesis and application of ecological and human communities, with the capacity to provide wise stewardship and conservation of natural resources;
 - b. tourism and outdoor recreation theories and best practices;
 - c. entrepreneurial and business management strategies.
6. Place-based and Global Understanding
 - a. skills to implement solutions appropriate for local environments that demonstrate fluency in global contexts and diverse cultures.

To fulfill the requirements, students must complete the following, earning 75+ credit hours in specified categories:

18 credit hours of ORTM Core courses:

1. Recreation & Tourism: ORTM 1000
2. Natural & Cultural Resources: ORTM 1050

3. Customer Service & Hospitality: ORTM 2000
4. Program Planning, Design, & Delivery: ORTM 2050
5. Tourism Theory & Practice: ORTM 3000
6. Operations, Management & Env. Stewardship: ORTM 3050

20+ credit hours in ORTM Foundations courses:

1. Statistics: STAT 2050 or STAT 2070
2. Business Fundamentals (complete one course from each area):
 - Economics (choose one course): ECON 1010, ECON 1020, or ECON 1200
 - Accounting: ACCT 2010
 - Marketing: MKT 3210
3. Environment & Natural Resources
 - Environmental Science (choose one course): ENR 1200, ENR/GEOL 1500, GEOG 1010, or GEOL 1100
 - Conservation & Sustainability (choose one course): ENR 1300, GEOL 1600, GEOG 4040, or RNEW 1000
4. People & Culture
 - Social Science (choose one course): GEOG 1000, GEOG 1020, PSYC 1000, or SOC 1000
 - Culture/Diversity (choose one course): AMST 2110, ENR/POLS 3620, ENR 2000, GEOG/NAIS 3400, NAIS 1001, NAIS 1030, NAIS 1350, or NAIS 2290

13+ credit hours in Synthesis & Applied Experience:

1. Professional Semester (complete all courses in the same semester): ORTM 4900, ORTM 4901, ORTM 4902, and ORTM 4903
2. Applied Experience (one credit minimum): ORTM 4970*
*students must complete a 400-hour internship experience prior to enrolling in ORTM 4970

19+ credit-hour Concentration (choose one):

- **Business & Hospitality Management**
 1. Legal Environment of Business: MGT 1040
 2. Management & Organization: MGT 3210
 3. Corporate Finance: FIN 3210
 4. Management (choose one course): MGT 3410, MGT 3420, or MKT 4590
 5. Sales & Marketing (choose one course): MKT 4230, MKT 4240, or MKT 4520

6. Business Analytics or Entrepreneurship (choose one course): ENTR 2700, ENTR 3700, FIN 4560, MGT 4500, MGT 4510, or MGT 4560
- **Management of Recreation Resources**
 1. Environmental or Biological Science (choose one course): ENR 1200 or LIFE 1010
 2. Resource Management (choose one course): ENR/ZOO 2450, ENR/GEOG 4040, GEOG 4080, GEOL 3650, REWM 2000, or REWM 4700
 3. Human Dimensions (choose one course): ENR 4960, ENR/AGEC 4450, ENR/AMST 3050, ENR/ANTH 4310, ENR/HIST 4412, ENR/HIST 4475, ENR/POLS 3620, ENR/SOC 3950, or MKT 4240
 4. Law & Policy: ENR/GEOG/POLS 4051, ENR/GEOG/POLS 4052, or ENR 4750
 5. Planning (choose one course): ERS 3400, ECON 2400, AGECE 4660, AGECE 4720, or ENR/AGECE 3750
 6. Geographic Information Systems or Analytics (choose one course): ENR/AGECE 4550, ENR/GEOL 4525, GIST 2100, GIST 2150, GIST 2160, GIST 3111, GIST/RNEW 4130, or STAT 3050
- **Cultural & International Tourism**
 1. Global Tourism: ORTM 4050
 2. International Experience: students must complete a faculty-led, semester-, or year-long study abroad course
 3. Cultural Resources (choose one course): ENR/SOC 3950, GEOG/NAIS 3400, GEOG 4570, INST 3000, INST 3200, INST 4060, INST 3450, or POLS 4475
 4. The American West (choose one course): GEOG 4500, GEOG 4502, HIST 2389, HIST 4020, HIST/NAIS 2290, HIST/NAIS 3000, HIST/NAIS 4000, or NAIS 3200
 5. Language (complete two consecutive language or ASL courses): LANG 1010 and LANG 1020
 6. Cultural/International Museum Studies: ANTH 2200, ANTH 2600, ANTH 3210, ANTH/AMST 2700, INST 2230, INST 2240, INST 2250, INST 2280, INST 2350, or POLS 2200

• Outdoor Recreation Leadership

1. Outdoor Leadership: ENR 2800
2. Management & Organization: MGT 3210
3. Wilderness First Responder and CPR certifications*: ENR 3900 or provide proof of certification to advisor
4. Leadership (choose one course): AGRI 3000, AGRI 4700, ENR 4950, CNSL 2200, CNSL 3010, FCSC 4117, or WMST 1900
5. Business (choose one course): ENTR 2700, ENTR 3700, FIN 3250, MGT 1040, MGT 3110, MKT 4590, or MGT 4500
6. Law & Policy: ENR/GEOG/POLS 4051, ENR/GEOG/POLS 4052, or ENR 4750
7. Human Dimensions (choose one course): ENR 4960, ENR/AGEC 4450, ENR/AMST 3050, ENR/ANTH 4310, ENR/HIST 4412, ENR/HIST 4475, ENR/POLS 3620, ENR/SOC 3950, or MKT 4240
8. Natural History: BOT 3100, BOT 4280, ENR 4010, 4011, and 4012 (must complete all three courses), ENR/AMST 3050, ENR/GEOG/GEOL 3450, GEOG 4460, GEOG/NAIS 3400, or GEOG 4000

• Creative Studies in Recreation & Tourism: self-designed program of study approved; requires approval from advisor

6+ credit hours of Haub School Requirements courses:

- U.S. Diversity (choose one) and Global Awareness (choose one)

**certifications must be current at time of graduation.*

Undergraduate Minor in ENR

An ENR minor may accompany any primary field of study. The ENR core, plus one elective course, fulfills the 18 credit hour requirement for the minor:

15+ credit hours of ENR Core courses:

1. Foundations of Environmental Science (choose one course): ENR 1200, ENR/GEOL 1500
2. Environment & Society: ENR 2000
3. Approaches to Problem Solving: ENR 3000
4. Environmental Assessment: ENR 4900
5. Applied Experience (2 credits): ENR 4970

3+ credit hours of ENR Electives

(choose one; three credits required): ENR 1300, ENR 2800, ENR 3900, ENR 4450, ENR 4600, ENR 4890, or ENR 4960

Undergraduate Minor in Sustainability

The sustainability minor is available to any undergraduate student at the University of Wyoming. The minor prioritizes systems thinking, civic engagement, and personal development rooted in sustainability for everyday challenges.

Students completing the sustainability minor will be expected to:

1. demonstrate a theoretical and historical understanding of sustainability;
2. develop a model of sustainability informed by personal values and integrated into student's worldview;
3. think holistically about consequences of actions and intellectually respond to perspectives of sustainability outside their own, as well as explore and evaluate the implications of sustainability values;
4. develop and implement sustainability solutions in their community and have the ability to apply sustainability principles to a range of disciplines and professional settings.

To fulfill the requirements for the minor, students must earn 18 credits hours:

9 credit hours of Sustainability Core courses:

1. Foundations of Sustainability: ENR 1300
2. Ethics & Justice (choose one): ENR/PHIL 2330, ENR/POLS 3650, HLED 4020, NAIS 1030, PHIL 3250, or WMST 4450
3. Campus Sustainability: ENR 4600

9+ credit hours of Sustainability

Electives courses (choose three courses from any of the following categories):

1. Culture & Society: AMST 4800, GEOG 4310, AMST 4030, ENR/ANTH 4310, ENR/SOC 3950, GEOG/NAIS 3400, GEOG 4310, GEOG 3550, or GEOL 3650
2. Economics & Policy: AGECE/ENR 3750, AGECE 4720, ENR 4750, ENR/GEOG/POLS 4051, ERS 3400, or INST/POLS 4455
3. Energy & Environment: ATSC 2100, ARE 2410, ENR 4010, 4011, and 4012 (must complete all three courses), ENR/CE 4430, ENR/

- GEOG/GEOL 3450, ENR/REWM 3100, ERS 3010, ERS 4050, ESS/GEOG/GEOL 3480, GEOG 4440, GEOL 1600, GEOL 3600, ME 4470, REWM 4200, or SOIL 3130
4. Food Systems: AECL 1000, AGECE 3860, ANTH 4260, BOT 3100, FCSC 3147, HLED 4020, PLNT 4020, or PLNT 4120

Undergraduate Minor in Outdoor Leadership

The outdoor leadership minor is available to any undergraduate student at the University of Wyoming. Students earning the minor will study leadership, ethics, field ecology, outdoor recreation, and wilderness medicine.

Students earning a minor in outdoor leadership will:

1. develop an understanding of leadership theories, including leadership movements, qualities, styles, and models;
2. identify and evaluate the cultural and environmental dimensions of outdoor leadership, including moral and ethical responsibilities, the fundamentals of ecological systems, and the human impact on the natural world;
3. demonstrate and apply outdoor leadership competency in a practical leadership role;
4. plan, implement, supervise, and analyze a high-quality, safe outdoor adventure and/or educational program;
5. earn and maintain a professional certification of Wilderness First Responder.

To fulfill the requirements, students must complete the following, earning 17+ credits in specified categories:

6+ credit hours of Outdoor Leadership Foundations courses:

1. Intro to Outdoor Leadership: ENR 2800
2. Environmental Science (choose one): ENR 1200, ENR/GEOL 1500, ENR/GEOG 4040, AECL 1000, GEOG 1010, GEOL 1100, or LIFE 3400

9+ credit hours of Concepts courses:

1. Field Ecology (choose one): ENR 1200, ENR 4010, 4011, and 4012 (must complete all three courses), or ENR 4960
2. Leadership (choose one): AGRI 3000, AGRI 4700, ENR 4950, CNSL 2200, CNSL 3010, FCSC 4117, or WMST 1900

3. Ethics & Culture (choose one): ENR/AMST 3050, ENR/ANTH 4310, ENR/PHIL 2330, ENR/POLS 3620, ENR/SOC 3950, GEOG/NAIS 3400, ORTM 1050, or ORTM 4901

3+ credit hours of Applied Experience

(choose one; three credits required): ENR 3700, ENR 4960, or ENR 4970

- Wilderness First Responder and CPR certifications*: ENR 3900 or provide proof of certification to advisor

**certification must be current at time of graduation*

Graduate Major in ENR

The ENR major is completed in tandem with any UW graduate degree. Students earning the ENR graduate major will take classes and conduct research in such fields as cultural studies, ecology, economics, law and politics, and management to:

- be conversant across a range of field of environmental significance, spanning science and technology to human dimensions of natural resources;
- understand and evaluate the relationship of your primary discipline to other relevant ENR fields; and
- produce discourse, scholarship, and practical solutions that address the complexity of ENR challenges.

In addition to degree requirements of the student's home department, students must complete 15 credit hours:

6 credit hours in ENR Core courses:

1. Approaches to Problem Solving: ENR 5000
2. Environmental Assessment: ENR 5900

9+ credit hours in ENR Electives courses (choose three+ courses from any of the following categories):

1. Human Dimensions: AGEC 4720, AGEC 5660, AMST 5030, ANTH 5260, ECON 5410, ENGL 4075, ENR 5450, ENR 5600, ENR/ANTH 4310, ENR/GEOG 4040, GEOG 4340, GEOG 5310, GEOG 5570, GEOG 5590, NASC 5650, REWM 5103, or WMST 5450
2. Law & Policy: ENR 5750, ENR/GEOG/POLS 5051, ENR/GEOG/POLS 4052, INST/POLS 5455, LAW 6660, LAW 6700, LAW 6800, LAW 6860, LAW 6865, or POLS 5475
3. Natural & Physical Sciences: BOT 5280, BOT 5700, BOT 5775, ENR 4010, 4011, and 4012 (must complete all three courses), ENR/REWM

- 5285, ENR/PATB 5240, GEOG 5450, GEOG/GEOL 5440, PLNT 5120, REWM 5000, REWM 5580, REWM 5710, REWM 5750, REWM 5400, RNEW 5500, or SOIL 5150
4. Quantitative & Qualitative Methods: BOT 5550, ENR/AGEC 5550, ENR/GEOL 5525, GIST 5050, GIST 5100, GIST 5150, GIST/RNEW 5130, or STAT 5050

Additional Program Requirements:

1. Statement of Purpose: Prior to or concurrent with declaring an Environment and Natural Resources (ENR) graduate major or minor, students must submit a 1-page Statement of Purpose describing how the Haub School's program aligns with their academic and professional goals.
2. Cumulative Learning Analysis: Immediately prior to graduation, students must submit a 1-2 page Cumulative Learning Analysis, analyzing their learning as a whole throughout their graduate work, informed by their coursework, research and co-curricular activities.
3. Program Completion Letter: Upon completion of ENR coursework, students will arrange a meeting with their advisor to ensure all requirements have been met. Once this step is complete, their advisor will submit a signed Program Completion Letter to the registrar, indicating the student should receive the ENR concurrent degree.

Graduate Minor in ENR

The ENR graduate minor is designed for doctoral students in any discipline who want to broaden their perspectives, experiences, and critical thinking skills to complex environmental problems. The minor is also available to master's students.

In addition to degree requirements of the student's home department, students must complete 12 credit hours:

6 credit hours in ENR Core courses:

1. Approaches to Problem Solving: ENR 5000
2. Environmental Assessment: ENR 5900

6+ credit hours in ENR Electives

courses (choose three+ courses from any of the following categories):

1. Human Dimensions: AGEC 4720, AGEC 5660, AMST 5030, ANTH 5260, ECON 5410, ENGL 4075, ENR 5450, ENR 5600, ENR/ANTH 4310, ENR/GEOG 4040, GEOG 4340, GEOG 5310, GEOG 5570, GEOG 5590, NASC 5650, REWM 5103, or WMST 5450
2. Law & Policy: ENR 5750, ENR/GEOG/POLS 5051, ENR/GEOG/POLS 4052, INST/POLS 5455, LAW 6660, LAW 6700, LAW 6800, LAW 6860, LAW 6865, or POLS 5475
3. Natural & Physical Sciences: BOT 5280, BOT 5700, BOT 5775, ENR 4010, 4011, and 4012 (must complete all three courses), ENR/REWM 5285, ENR/PATB 5240, GEOG 5450, GEOG/GEOL 5440, PLNT 5120, REWM 5000, REWM 5580, REWM 5710, REWM 5750, REWM 5400, RNEW 5500, or SOIL 5150
4. Quantitative & Qualitative Methods: BOT 5550, ENR/AGEC 5550, ENR/GEOL 5525, GIST 5050, GIST 5100, GIST 5150, GIST/RNEW 5130, or STAT 5050

Additional Program Requirements:

4. Statement of Purpose: Prior to or concurrent with declaring an Environment and Natural Resources (ENR) graduate major or minor, students must submit a 1-page Statement of Purpose describing how the Haub School's program aligns with their academic and professional goals.
5. Cumulative Learning Analysis: Immediately prior to graduation, students must submit a 1-2 page Cumulative Learning Analysis, analyzing their learning as a whole throughout their graduate work, informed by their coursework, research and co-curricular activities.
6. Program Completion Letter: Upon completion of ENR coursework, students will arrange a meeting with their advisor to ensure all requirements have been met. Once this step is complete, their advisor will submit a signed Program Completion Letter to the registrar, indicating the student should receive the ENR concurrent degree.

Juris Doctor/Master of Arts in ENR

Students working toward the J.D./M.A. in ENR consult a Haub School advisor to design a program of study tailored to meet their educational goals. Students must earn a minimum of 30 credits for the master's degree:

9 credit hours in ENR Core courses:

1. Approaches to Problem Solving: ENR 5000
2. Environmental Assessment: ENR 5900

Second- or third-year students take 6 credits of foundational coursework designed to introduce alternative approaches to problem solving and environmental assessment practices.

3. Plan B Writing Seminar (1 credit): ENR 5890

Typically completed in the first semester of the third year.

4. Plan B Thesis: JD/MA (2 credits): ENR 5961

9 credit hours in ENR Electives courses

(choose three+ courses in consultation with Haub School advisor):

1. Humanities: AMST 5030, ANTH 5620, ENGL 4075, ENR 5600, ENR 5960, ENR/GEOG 4040, GEOG 5310, NASC 5650, or WMST 5450
2. Environmental Science: BOT 5700, BOT 5280, BOT 5775, ENR 4010, 4011, and 4012 (must complete all three courses), ENR/ZOO 5240, ENR/REWM 5285, GEOG 5440, GEOG 5450, GEOG 5880, PLNT 5120, REWM 5580, REWM 5710, RNEW 5400, RNEW 5500, or SOIL 5150
3. Social Science: AGECE 4720, AGECE 5660, ECON 5410, ENR 5750, ENR/AGECE 5450, ENR/AGECE 5550, ENR/GEOG 5050, ENR/GEOL 5525, ENR/POLS 5051, GEOG 5325, GIST/RNEW 5130, GIST 5211, INST/POLS 5445, INST/POLS 5455, INST/POLS 5475, POLS 5710, REWM 5000, REWM 5103, or STAT 5050

Second-, third-, or fourth-year students must take a minimum of 9 credits outside the College of Law. Courses familiarize students with non-law ENR perspectives and approaches. Students work with a Haub School advisor to select courses from an approved list.

12 credit hours in Environmental and Natural Resources Law Specialization courses: LAW 6510, LAW 6660, LAW 6700, LAW 6790, LAW 6800, LAW 6860, LAW 6890, LAW 6910, LAW 6991, LAW 6992, LAW 6915, LAW 6915, or LAW 6500

Students will take 12 credits to gain depth in ENR law. Special approval may be granted for special topics courses.

Plan B Project research:

1. Students must complete a cumulative work of scholarship known as the Plan B project. The Plan B offers more flexibility than a traditional thesis in content and format. Students will be required to choose a UW faculty advisor and at least two additional committee members. Committee composition is subject to approval by the director of academics. A public oral defense of the project is required. All members of the student's committee must be present at the defense.

Graduate Minor in Collaborative Practice

The Collaborative Practice minor is designed to provide students with skills in designing, organizing, facilitating, and evaluating collaborative decision-making processes. Students pursuing the Collaborative Practice minor will:

- build process competencies in collaborative decision making and problem solving, and
- deepen their knowledge in the application of collaborative processes in specific contexts (natural resources, health, education, business, etc.).

Collaborative Practice minor students who are currently working towards an ENR graduate major may not count ENR 5290 or ENR 5291 towards their ENR major. ENR 5450 (Negotiation) and one elective (approved for both the Collaborative Practice minor and the ENR major) may count for both. In addition to degree requirements of the student's home department, students must complete 12 credit hours:

9 credit hours in Collaborative Practice Core courses:

1. Negotiation: ENR 5450
2. Principles & Methods in Collaborative Practice: ENR 5920
3. Collaborative Practicum: ENR 5921

3 credit hours in Collaborative Practice Electives (choose one course from any of the following categories):

1. Collaborative Process: COJO 5250, COJO 5230, COJO 5620, ENR 5550, POLS 5080, POLS 5540, or POLS 5685
2. Natural Resources: ENR 5000, LAW 6660, LAW 6800, or REWM 5250
3. Education: EDAD 5650, or EDAD 5720

Environment and Natural Resources (ENR)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB↔Q]).

1000. Energy and Society. 3. [O↔PN]

Introduces humans' past, present, and future sources of energy and their advantages and limitations. Discusses society's current, non-sustainable pattern of energy use from a supply and environmental perspective. Investigates the technical, environmental, political, and societal problems associated with the eventual conversion to renewable energy resources. Cross listed with ERS 1000.

1100. Environment and Natural Resource Problems and Policies. 2. [I,L↔(none)]

Survey of environmental and natural resources issues and policies at local/regional, national, and global scales. Students are challenged to think critically as they dissect the causes, complexities, and solutions of contemporary, interdisciplinary environmental and natural resource challenges.

1101. First-Year Seminar. 3. [(none)↔FYS]

1200. Environment. 4. [SB↔PN].

Introductory environmental science course appropriate for science and nonscience majors. Uses cases studies and applied laboratories to explore core biological principles such as nutrient flow and cycling, population and community ecology, and ecosystem structure and function, as well as the non-science dimensions of ENR issues. Early-semester, weekend field trips/labs required.

1300. Foundations of Sustainability. 3.

Examine the basic concepts, theories, and practice of sustainability as a foundation for future learning in the field. Explore principles of sustainability in our community and personal lives through various lenses and systems.

1400. Biodiversity: Science and Society. 3.

[I, L↔(none)] Biodiversity lays the foundation for nature's ability to properly function. In turn humans depend on a healthy-functioning

natural system. Adequate biodiversity provides us with many things including new genetic material for agriculture, medical discoveries, recreational opportunities and good mental health. This course will examine key themes in our understanding of biodiversity. Students enrolled in this course will have a better understanding of issues, challenges and potential solutions to our current biodiversity crisis. Course meetings will largely consist of group discussions of assigned readings. Discussions will focus on critically evaluating and analyzing information, hypotheses and knowledge that arise from the readings. Writing assignments will emphasize succinct but thorough interpretation of information, policy, conservation and societal impacts of biodiversity.

1500. Water, Dirt, and Earth's Environment. 4. [SE◀PN]. Introductory environmental geology course focusing on water and soil both as hazards and as life-sustaining resources. Explores surface processes and climate change over geological and human timescales. Case studies illustrate the environmental tradeoffs of resource use. Cross listed with GEOL 1500.

2000. Environment and Society. 3. [G◀COM2] Develops understanding of the nature and dimensions of environmental and natural resource issues. Explores ways in which elements of society approach, evaluate, and develop positions relative to environmental issues. Uses case studies to illustrate the contemporary and historical role of individuals and societies in identifying and addressing environmental issues at scales ranging from local to global.

2030. History and Environmental Science. 3. [(none)◀H] This course is designed as an introduction to both the historical work of environmental historians and the scientific work of environmental scientists. No previous background in either history or science is required. Cross listed with HIST 2030.

2100 [BOT 2100]. Forest Management. 3. Principles of forest management. Topics include the laws affecting forest management, methods of harvesting wood from forests, fire and insect management, the effects of disturbances on stream flow and nutrient cycling, and the challenges of developing management plans for forests. Cross listed with RNEW 2100. *Prerequisite:* LIFE 1001 or 1010.

2330. Environmental Ethics. 3. [CH◀(none)] Introduces students to ethical theory in environmental problem cases, and to philosophical issues in environmental philosophy. Ethical theories include natural law, utilitarianism, deontological and rights-based

theories, relativism. Topics may include: conservation/preservation, resource management, pollution, overpopulation, factory farming, Leopold's land ethic, deep ecology, holism, eco-feminism. Cross listed with PHIL 2330.

2345. Natural Resource Ethics. 3. [CH,D◀(none)] Introduces students to ethics in context of natural resource extraction, use, conservation, preservation, and distribution. Ethical frameworks include teleological and deontological theories primarily applied to human needs and wants. Concepts and applications of environmental justice are addressed, including private property, sustainability, and obligations to future generations. Cross listed with PHIL/RNEW 2345.

2450. Fish and Wildlife Management in the Anthropocene. 4. [(none)◀COM2] Course examines fundamental principles in management of natural resources, especially fish and wildlife populations. Students explore historical to contemporary context of management, population biology, management tools and their application, career opportunities, with specific emphasis on human dimensions, law, and policy. Students will develop oral and written communication skills. Cross listed with ZOO 2450. *Prerequisites:* LIFE 1010, LIFE 2022, and COM1.

2800. Introduction to Outdoor Leadership. 3. Designed to increase knowledge and competencies related to leading others in the outdoors. Significant focus is on self-awareness, judgment, and decision-making. The specific skills and theories students learn throughout provide a foundation for other leadership endeavors. *Prerequisite:* consent of instructor.

3000 [4000]. Approaches to ENR Problem Solving. 3. [CS,WB◀H] Provides an introduction to environmental and natural resources problem solving and decision making. Students learn how scholars and practitioners define and structure ENR problems for management and policy decision making. Additionally, students learn approaches, processes and techniques that address problems analytically and in a values-oriented context. *Prerequisite:* ENR 2000.

3050. Cultures of Nature in the United States. 3. Uses artistic, philosophical, historical and literary material to investigate how ideas about and representations of nature have changed over time in the U.S. Culminates in an examination of a wide range of contemporary environmental ideas within this broad historical and cultural context. Cross listed with AMST/WMST 3050. *Prerequisite:* 2000-level course in one of the following departments:

AMST, American history, American literature, or a 2000-level course approved for the ENR program.

3100. Principles of Wildland Water Quality. 3. Basic principles of aquatic chemistry and water quality as they relate to watershed management practices including livestock production, agronomic production, mineral and natural gas extraction and other land uses. Cross listed with REWM 3100. *Prerequisite:* CHEM 1000. (Normally offered fall semester)

3130. Environmental Quality. 3. Introduction to environmental quality issues and events. Course emphasizes impacts to soil, water, atmospheric, and vegetative ecosystems due to different nutrients and contaminants, including nitrogen, phosphorus, sulfur, trace elements, and organic chemicals. Current information pertaining to environmental quality is discussed and a field trip to the Union Pacific Tie Plant. Cross listed with SOIL 3130. *Prerequisite:* complete at least 1 University Studies Science course SB, SP or SE. (Offered fall semester)

3300. Environmental Policy, Conservation and Development in India. 3. [(none)◀COM2] This course will focus on India's environmental policies pertaining to conservation and development. Case studies will be used to understand how these policies were developed, put in place, and their intended and actual outcomes. Students are required to select a suitable topic and conduct research and submit a research report. *Prerequisite:* WA/COM1 course.

3450 [G&R 3450]. Weather and Climate. 3. Systematically examines elements and controls of weather and climate with application to regions. Cross listed with GEOG 3450. *Prerequisite:* GEOG 1000, 1010 or 1020. (Normally offered fall semester)

3620. Environmental Justice. 3. Examines core philosophical understandings of justice and applies them to the environment through a variety of case studies, analytical essays and monographs. Cross listed with POLS 3620. *Prerequisite:* POLS 1000, POLS 2460, or POLS 3600, or permission of instructor.

3700. Wyoming Conservation Corps Practicum. 1-2. Required for students entering the WCC. Students will be required to make weekly journal entries and write a paper on a topic germane to their WCC experience. Additionally, necessary training for the Wyoming Conservation Corps program will be included in the course content. *Prerequisites:* Acceptance into the Wyoming Conservation Corps program.

3750 [4750]. Natural Resource Planning and Economics. 3. Economic concepts and rudimentary analytical tools are applied to federal, state and local natural resource planning and management programs. The value of economic input into natural resource policy is examined. Evaluating tradeoffs and resolving conflicts play a particularly important role in the course content. Cross listed with AGECE 3750. *Prerequisites:* QA, WA and junior standing. (Offered spring semester of odd-numbered years)

3900. Seminar in Environment and Natural Resources. 1-3 (Max. 3). Examines research and policy perspectives by a variety of authorities on selected environment and natural resource problems and issues. *Prerequisite:* ENR 3000.

3950. Environmental Sociology. 3. Explores how ecology, technology, politics, economics, and culture intersect. By analyzing key contemporary environmental debates, students will develop an understanding of sociological analyses, and the impact of social life on our environment, as well as the effect of the environment on social life. Topics covered include: the environmental movement; sustainable development; developing nations and their environment; capitalism and technology; and environmental justice. Cross listed with SOC 3950. *Prerequisite:* SOC 1000.

4010. Winter Ecology: Skills of the Winter Naturalist. 1. Emphasizes field naturalist skills, the effects of winter abiotic conditions on organisms and subsequent adaptations to these conditions, animal tracking, introduction to snow dynamics and winter safety. *Prerequisite:* 6 hours of ENR or science courses.

4011. Winter Ecology: Snowpack Science and Dynamics. 1. Emphasizes snow science and avalanche safety through lectures and inquiry-based field laboratories. *Prerequisite:* 6 hours of ENR or science courses.

4012. Winter Ecology: Wildlife and Plant Adaptations. 1. Emphasizes animal and plant adaptations to cope with the stresses of winter, as well as the predicted impacts of climate change, through lectures and inquiry-based field laboratories. Students also conduct field research in a winter environment. *Prerequisite:* 6 hours of ENR or science courses.

4030. Ecology of Knowledge. 3. Examines the development of “disciplines” and explores definitions, theories, methods and practices of interdisciplinary work. Cross listed with AMST 4030. Dual listed with ENR 5030. *Prerequisite:* 3 hours in any interdisciplinary program.

4040 [G&R 4040]. Conservation of Natural Resources. 3. [CS◀(none)] Geographically analyzes conservation of natural and human resources, as well as political, social and ethical ramifications of our environmental policy. Cross listed with BOT/GEOG 4040. *Prerequisite:* 6 hours of geography or ENR.

4051. Environmental Politics. 3. Analyzes environmentalism as a political phenomenon. Provides students with a basic understanding of how to analyze political issues by: (1) examining the historical and contemporary issues that produce controversy over environmental matters; and (2) surveying the impacts of these issues on the formulation and implementation of laws, policies, and regulations. Cross listed with AMST, POLS, GEOG and REWM 4051. *Prerequisite:* POLS 1000.

4052. Federal Land Politics. 3. Examines the political forces that have shaped and continue to shape federal land policy and management. Explores the interactions between democratic decision making and science in the management of federal lands. Surveys the sources of controversy over federal land management and methods for harmonizing public demands with technical expertise. Cross listed with POLS/AMST/GEOG/REWM 4052. *Prerequisite:* POLS 1000.

4240. Disease Ecology. 3. Introduction to 1) how interactions among species, ecosystems, human systems, and abiotic components of the environment affect patterns and processes of disease, and 2) considerations for coevolution of hosts and pathogens, conservation biology, models used to understand disease dynamics, and approaches to manage and control disease in animals, plants, and humans. Dual listed with ENR 5240. Cross listed with PATB 4240. *Prerequisites:* LIFE 2022 or 2023 and STAT 2050 or 2070.

4285. Wildland Hydrology. 3. Teaches essential and unique characteristics of hydrologic cycle as occurs on range and forest lands, concentrating on quantification of these processes and storages. Cross listed with REWM 4285. Dual listed with ENR 5285. *Prerequisite:* graduate standing and University Studies QA.

4310. Environmental Anthropology. 3. Addresses how human societies interact with their surroundings, emphasizing cultural understandings of the environment. Introduces variety of theoretical and methodological approaches to topics ranging from problems of the American West to global environmental change. Cross listed with ANTH 4310. Dual listed with ENR 5310. *Prerequisite:* ANTH 1200. (Normally offered every third semester)

4412. Global Environment History. 3. [(none)<>H] This course is designed to introduce undergraduate and graduate students to the new field of global environmental history. The Global Environment History course will provide a new way of looking at humans, animals, and the lives they’ve built in the environment and the costs of their decisions to the environment. Cross listed with HIST 4412. *Prerequisite:* 9 hours of HIST or ENR.

4420. Conservation Biology. 3. Addresses the broadest environmental issues facing society (habitat loss, invasion, overexploitation) and the mechanisms driving them, with particular attention to the Intermountain West. Through computer exercises, students also learn how to evaluate conservation efforts and make management recommendations. Cross listed with BOT/ZOO 4420. *Prerequisites:* LIFE 3400 and one of the following: ENR 3500, STAT 2050, or STAT 2070.

4430. Green Chemistry and Global Environmental Problems. 3. Focus includes study of the chemistry of air, water, and soil as well as the effects of anthropogenic activities on natural processes. Emphasis is also placed on sustainability and green chemistry practices and technologies. Cross listed with CE/CHE 4430. *Prerequisite:* CHEM 1020.

4450. Negotiation. 3. Examines how to use negotiation to resolve conflict and get agreement. Describes conflict; outlines ways to address conflict; examines different negotiation strategies and the impact of cognitive bias, power, ethics, and individual and cultural differences; and explores mediation practices. Students complete negotiations, role-plays, and questionnaires. Cross listed with AGECE 4450. Dual listed with ENR 5450. *Prerequisite:* completion of USP O requirement; junior standing.

4500. Risk Analysis. 4. [QB◀(none)] Introduces basic concepts of risk analysis, including risk perception, identification, assessment, communication, management, and policy. Provides quantitative treatment of risk assessment procedures, fundamental mathematical models, and the concepts of variability and uncertainty; and practical experience in risk analyses conducted by teams of students. Emphasizes environment and natural resource examples. Laboratory. Dual listed with ENR 5500. *Prerequisites:* MATH 1000 or 1400, introductory statistics and familiarity with Excel spreadsheets.

4525. Environmental Data Analysis. 4. Explores fundamentals of environmental data analysis including the display and description of data, uncertainty propagation, statistical

significance and power, t-tests, ANOVA, time series, serial correlation, multiple regression, and sample collection strategies. Students must enroll in a computer-based lab session and complete a term project involving real-world problems in data analysis. Dual listed with ENR 5525. Cross listed with GEOL 4525/5525. *Prerequisites:* A grade of C or better in STAT 2050 or STAT 2070 or MATH 2200, junior standing or higher, and completion of at least one upper-division course in the natural sciences or a related field.

4550 [4700]. Negotiation Analysis. 3. Focuses on using an analytical perspective for maximizing joint gains between negotiators. Students learn analytical techniques to prepare for negotiation, evaluate options and proposals during a negotiation, and evaluate negotiated outcomes with respect to maximization of joint gains and fairness criteria. Dual listed with ENR 5550; Cross listed with AGECE 4550. *Prerequisite:* QA.

4600. Campus Sustainability. 3. Uses campus as a setting to explore long-term environmental, economic, and social sustainability theory and practice. Students design and implement a semester-long project to improve sustainability of the UW campus. This interdisciplinary course is appropriate for students of all disciplines. Dual listed with ENR 5600; cross listed with MKT 4600. *Prerequisites:* junior or senior standing.

4700. Media, Science, and Society. 3. This course discusses why scientific, health, and environmental issues are covered in particular ways in media. We will also examine how these messages impact people's attitudes, opinion, knowledge, and emotions about science, health, and the environment. Dual listed with ENR 5700; cross listed with COJO 4700. *Prerequisites:* COJO 1000 or ENR 1200 or ENR 1500 or ENR 2000.

4750. ENR Law and Policy. 3. Explores the policy underpinnings of environmental and natural resource issues and the legal responses to these problems. Students will gain a basic understanding of: (1) the causes of environmental problems, including energy, water, wildlife, and other western land use issues; (2) the range of policy and instrument choices; and (3) the approaches actually taken in current laws. Students also will apply the law in an interdisciplinary, problem-based learning context. Dual listed with ENR 5750. *Prerequisites:* ENR 2000 and upper division standing or permission of instructor.

4800. Historic Preservation. 3. Review of the roots of historic preservation in Western culture with an emphasis on the historical and

legal context of architectural conservation in America. Current issues in preservation are examined through case studies and guest presentations. Cross listed with AMST 4800. Dual listed with ENR 5800. *Prerequisite:* ARE 3020 or AMST 5400.

4890 [4990]. Topics in Environment and Natural Resources. 1-6.0 (Max. 12). Special topics in environment and natural resources are offered under this number. The specific subject matter varies each year because the course is normally taught by faculty who wish to present a specialized topic of interest to ENR and other students. Check class schedule for specific topics offered each year. Dual listed with ENR 5890. *Prerequisites:* ENR 3000 or permission of the instructor.

4900. ENR Policy in Practice. 3. [WC◀COM3] Encompasses student resolution in multidisciplinary teams of environmental and natural resource problems and issues; practice in formulating policy alternatives; case studies; planning, performing and coordinating multidisciplinary research. Dual listed with ENR 5900. *Prerequisite:* ENR 3000.

4950. Leadership in Natural Resources Management. 2. Provides Crew Leaders in the Wyoming Conservation Corps with an understanding of the complex dynamics of natural resources management while also equipping students with the tools to confidently lead groups of students on conservation-oriented service-learning projects on Wyoming's public lands during the summer months. Dual listed with ENR 5950; cross listed with ERS 4950. *Prerequisites:* ENR 3700 and consent of instructor.

4960. Field Studies in: 1-6. Field-based courses in Environment and Natural Resources are taught under this number. The specific subject matter varies depending upon the location and content of each courses. Students frequently need to apply in advance. *Prerequisite:* 6 credits of ENR coursework.

4970. ENR Internship. 1-6 (Max. 6). Provides practical experience in environmental and natural resource policy, management and decision processes, as well as interaction with professionals in the field. Offered S/U only. *Prerequisite:* ENR 3000.

4975. Independent Study. 1-6 (Max. 6). Offers students the opportunity to independently complete special academic studies under direction of a faculty member. Readings, papers, and projects are completed as directed. Dual listed with ENR 5975. *Prerequisite:* 6 credits in ENR.

5000. Approaches to Environment and Natural Resources Problem-Solving. 3. Explores important environmental policy, collaborative and adaptive decision-making and the integration of diverse disciplines in the study and resolution of complex ENR challenges. This is the first course in the ENR Capstone series (along with ENR 4900) and the students should take both capstone courses in the same academic year. Dual listed with ENR 4000. *Prerequisite:* USP WA course.

5030. Ecology of Knowledge. 3. Examines the development of "disciplines" and explores definitions, theories, methods and practices of interdisciplinary work. Cross listed with AMST 5030. Dual listed with ENR 4030. *Prerequisite:* graduate status.

5050. Techniques in Environmental Data Management. 4. Centers on the role of information technology in support of scientific research. Through integration of multiple software packages (e.g. Relational databases, ProgramR and ArcGIS), proven database designs, and SQL scripting, increased efficiency and utility will occur during data analyses. These information science principles are demonstrated using project-based examples. Cross listed with ECOL/GEOG 5050. *Prerequisite:* graduate standing.

5150. Environmental Science: Perspectives and Methods. 3. This course will use complex, real-world environmental challenges to explore fundamental scientific principles. Students will learn how scientists tackle environmental issues by formulating objectives, collecting and analyzing scientific data, as well as to critically evaluate information sources and limitations to scientific approaches due to constraints associated with each study. *Prerequisite:* graduate standing.

5240. Disease Ecology. 3. Introduction to 1) how interactions among species, ecosystems, human systems, and abiotic components of the environment affect patterns and processes of disease, and 2) considerations for coevolution of hosts and pathogens, conservation biology, models used to understand disease dynamics, and approaches to manage and control disease in animals, plants, and humans. Dual listed with ENR 4240. Cross listed with PATB 5240.

5270. Writing and Reviewing Science. 4. This course will help students prepare a scientific manuscript for submission to a peer-reviewed journal; in so doing, students will become more effective, efficient, and confident writers. Students will learn principles of effective writing, how to prepare a manuscript for publication, navigate the peer-review process, and write a constructive review. Cross listed

with ZOO 5270. *Prerequisite:* Students must have graduate standing and an analyzed dataset on which the manuscript will be based. Students must have approval from their advisors and key collaborators before embarking on this journey. Students are also encouraged to maintain this approval throughout the semester.

5285. Wildland Hydrology. 3. Teaches essential and unique characteristics of hydrologic cycle as occurs on range and forest lands, concentrating on quantification of these processes and storages. Cross listed with REWM 5285. Dual listed with ENR 4285. *Prerequisite:* graduate standing and University Studies QA.

5310. Environmental Anthropology. 3. Addresses how human societies interact with their surroundings, emphasizing cultural understandings of the environment. Introduces variety of theoretical and methodological approaches to topics ranging from problems of the American West to global environmental change. Cross listed with ANTH 5310. Dual listed with ENR 4310. *Prerequisite:* ANTH 1200.

5450. Negotiation. 3. Examines how to use negotiation to resolve conflict and get agreement. Describes conflict; outlines ways to address conflict; examines different negotiation strategies and the impact of cognitive bias, power, ethics, and individual and cultural differences; and explores mediation practices. Students complete negotiations, role-plays, and questionnaires. Cross listed with AGECE 5450. Dual listed with ENR 4450. *Prerequisite:* completion of USP O requirement; junior standing.

5500. Risk Analysis. 4. Introduces basic concepts of risk analysis, including risk perception, identification, assessment, communication, management, and policy. Provides quantitative treatment of risk assessment procedures, fundamental mathematical models, and the concepts of variability and uncertainty; and practical experience in risk analyses conducted by teams of students. Emphasizes environment and natural resource examples. Laboratory. Dual listed with ENR 4500. *Prerequisites:* MATH 1000 or 1400, introductory statistics and familiarity with Excel spreadsheets.

5525. Environmental Data Analysis. 4. Explores fundamentals of environmental data analysis including the display and description of data, uncertainty propagation, statistical significance and power, t-tests, ANOVA, time series, serial correlation, multiple regression, and sample collection strategies. Students must enroll in a computer-based lab session and complete a term project involving real-

world problems in data analysis. Dual listed with ENR 5525. Cross listed with GEOL 4525/5525.

5550 [5700]. Negotiation Analysis. 3. Focuses on using an analytical perspective for maximizing joint gains between negotiators. Students learn analytical techniques to prepare for negotiation, evaluate options and proposals during a negotiation, and evaluate negotiated outcomes with respect to maximization of joint gains and fairness criteria. Dual listed with ENR 4550; Cross listed with AGECE 5550. *Prerequisite:* QA.

5600. Campus Sustainability. 3. Uses campus as a setting to explore long-term environmental, economic, and social sustainability theory and practice. Students design and implement a semester-long project to improve sustainability of the UW campus. This is an interdisciplinary course and is appropriate for students of all disciplines. Dual listed with ENR 4600; cross listed with MKT 5600. *Prerequisite:* USP WB course.

5700. Media, Science, and Society. 3. This course discusses why scientific, health, and environmental issues are covered in particular ways in media. We will also examine how these messages impact people's attitudes, opinion, knowledge, and emotions about science, health, and the environment. Dual listed with ENR 4700; cross listed with COJO 5700. *Prerequisite:* graduate standing.

5750. ENR Law and Policy. 3. Explores the policy underpinnings of environmental and natural resource issues and the legal responses to these problems. Students will gain a basic understanding of: (1) the causes of environmental problems, including energy, water, wildlife, and other western land use issues; (2) the range of policy and instrument choices; and (3) the approaches actually taken in current laws. Students also will apply the law in an interdisciplinary, problem-based learning context. Dual listed with ENR 4750. *Prerequisites:* ENR 2000 and upper division standing or permission of instructor.

5800. Historic Preservation. 3. Review of the roots of historic preservation in Western culture with an emphasis on the historical and legal context of architectural conservation in America. Current issues in preservation are examined through case studies and guest presentations. Cross listed with AMST 5800. Dual listed with ENR 4800. *Prerequisite:* ARE 3020 or AMST 5400.

5870. Graduate Seminar. 1 (Max. 6). Faculty-student discussion, reading, and study focused on a selected topic and interest. *Prerequisite:* graduate standing.

5890. Topics in Environment and Natural Resources. 1-6 (Max. 12). Special topics in environment and natural resources are offered under this number. The specific subject matter varies each year because the course is normally taught by faculty who wish to present a specialized topic of interest to ENR and other students. Check class schedule for specific topics offered each year. Dual listed with ENR 4890. *Prerequisite:* ENR 5000 or consent of instructor.

5900. ENR Policy in Practice. 3. Encompasses student resolution in multidisciplinary teams of environmental and natural resource problems and issues; practice in formulating policy alternatives; case studies; planning, performing and coordinating multidisciplinary research. Dual listed with ENR 4900. *Prerequisites:* graduate standing and ENR 5000.

5920. Collaborative Practice Methods. 3. This course introduces students to the principles, concepts, and methods of collaborative decision making as it is practiced in a variety of settings. Students acquire collaborative skills and competencies in collaborative processes such as working in teams and facilitating groups, negotiating and managing conflict, conducting situation assessments and issue analyses, and developing methods and standards for integrating technical information in collaborative decision making. The course will involve extensive use of cases, role-plays, and related participative activities. *Prerequisite:* Admission by consent of instructor.

5921. Collaborative Practicum. 1 (Max. 3). Under the guidance and instruction of ENR faculty, students will have the opportunity to apply the skills and information gained in ENR 5920 to real-world situations. Students will gain practical experience in collaboration, facilitative leadership, and conflict resolution and to develop and refine skills in one or more of the learning objectives and expected competencies. *Prerequisite:* ENR 5920.

5950. Leadership in Natural Resources Management. 2. Provides Crew Leaders in the Wyoming Conservation Corps with an understanding of the complex dynamics of natural resources management while also equipping students with the tools to confidently lead groups of students on conservation-oriented service-learning projects on Wyoming's public lands during the summer months. Dual listed with ENR 4950; cross listed with ERS 5950. *Prerequisites:* ENR 3700 and consent of instructor.

5961. Plan B Projects. 2 (Max. 6). Limited to students enrolled in a Plan B graduate program. Students will be involved in non-course scholarly activities in support of the Plan B project. Restricted to ENR graduate students.

5975. Independent Study. 1-6 (Max. 6). Offers students the opportunity to independently complete special academic studies under direction of a faculty member. Readings, papers, and projects are completed as directed. Dual listed with ENR 4975. *Prerequisite:* 6 credits in ENR.

Environmental Systems Science (ESS)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1000. Wyoming in the Earth System. 3. [I,L▶(none)] Introduces the study of environmental systems science by investigating Earth's atmosphere, atmosphere, biosphere, and lithosphere. Studying Wyoming's unique environments and current issues, students will access, analyze, and interpret data to understand how natural and human-caused changes influence larger Earth and environmental systems.

2000. Geochemical Cycles and the Earth System. 4. [SE▶(none)] Introduces the Earth system, including the solid Earth, hydrosphere, biosphere and atmosphere. Emphasizes the evolution of the Earth, rock associations and geochemical cycles. Cross listed with GEOL 2000. *Prerequisites:* a 1000-level GEOL course with a lab and concurrent enrollment in CHEM 1020. (Normally offered fall semester)

3480. Environmental Change. 3. [G,WB▶(none)] Examines changes in the bio-physical environments and landscapes of Earth during its habitation by humans. Emphasizes integrated approaches to understanding environmental changes based on climatological, ecological, geological, archeological, and historical evidence. Explores how humans have modified Earth's environments and how societies have responded to natural and anthropogenic environmental change. Cross listed with GEOG 3480. *Prerequisites:* GEOG 1010 or any USP PN course and USP COM1.

4001. Modeling the Earth System. 4. Takes a modeling approach to demonstrate how the Earth is integrated into an interconnected system through exchanges of energy and matter, and how Earth system functioning is susceptible to human alteration. Unifying concepts focus on quantitative interactions between the Earth and the Sun, and between the Earth's

lithosphere, hydrosphere, biosphere and atmosphere. Cross listed with ATSC/BOT/GEOL 4001. *Prerequisites:* MATH 2205 or equivalent and [ESS 2000 or GEOL 2000].

4780. Biogeochemistry. 3. A comprehensive treatment of biogeochemistry with emphasis on biogenic elements and biological processes. Reviews occurrence of elements, their behavior in the biosphere, and how their cycles are affected by humans. Dual listed with ESS 5780. Cross listed with BOT 4780. *Prerequisite:* Consent of instructor.

4950. Exploring the Earth System. 3. [WC▶COM3] Conduct critical and interdisciplinary assessments on complex topics addressing physical, biological, and human components of the Earth System. Through multiple written, oral, and digital communication products, students will work independently and collaboratively to critically review existing literature, define knowledge gaps, analyze evidence, and synthesize results for multiple audiences. *Prerequisites:* ESS 1000 and either ESS 3480 or ENR 3450.

4970. Internship in Earth System Science. 1-6 (Max. 6). Offers students an individualized opportunity to connect their academic training, professional experiences, and future goals. Students must first consult with their Haub School advisor and have completed and appropriate internship, professional and/or applied experience that provides exposure to complex environmental systems, scientific practices, and relevant interactions in the professional world. *Prerequisite:* ESS 1000.

5780. Biogeochemistry. 3. A comprehensive treatment of biogeochemistry with emphasis on biogenic elements and biological processes. Reviews occurrence of elements, their behavior in the biosphere, and how their cycles are affected by humans. Dual listed with ESS 4780. Cross listed with BOT 5780. *Prerequisite:* Consent of instructor.

Outdoor Recreation and Tourism Management (ORTM)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB▶Q]).

1000. Foundations of Recreation and Tourism. 3. Introduces the conceptual foundations, array of services, and management with recreation and tourism. Primary focal points for this course include historical and psychological underpinnings, market trends, types of resources and services, cultural, economic,

political, and legal considerations, and career opportunities. Emphasizes the relationship to resource stewardship.

1050. Natural and Cultural Resources of the West. 3. The American West is an attraction for visitors, largely due to its unique sense of place, blend of people and culture, history and natural resources. Within the context of outdoor recreation and cultural/historical tourist attractions, students will examine diverse natural and cultural resources.

2000. Foundations of Customer Service and Hospitality. 3. Customer service and hospitality are fundamental to providing high-quality services. This course examines critical elements of excellent customer service in the tourism industry, including transportation, accommodation, food and beverage, and attractions. Students will develop communication skills relating to customer service, self-presentation, and interpersonal interactions, including international and cultural communications.

2050. Program Planning, Design and Delivery. [(none)▶COM2] Design, delivery, and marketing of programs to diverse and inclusive audiences. Students will utilize tools, analytics, and techniques in both the direct supply and facilitation of a planned experience. Students will design and implement a program to a non-peer group. *Prerequisite:* ORTM 1000.

3000. Tourism Theory and Practice. 3. Tourism is a dynamic system of global interconnection that impacts human and natural environments in myriad ways. This course examines the behavioral, social, economic, political, and environmental issues implicated in and affected by tourism and its industries. Students will develop a critical understanding of the implications on the practice of tourism today. *Prerequisite:* junior standing.

3050. Operations, Management and Environmental Stewardship. 3. Operations and management are critical aspects of the successful delivery of quality recreation and tourism experiences. Students will evaluate environmental stewardship challenges and potential solutions with the integration of operations and management. Students will develop an understanding of functions that are critical to operational leadership, such as revenue management (budgeting, cost controls, profit centers), and human capital management. *Prerequisites:* ORTM and junior standing.

4900. Outdoor Recreation and Tourism Management Business Strategies. 3. Application of the successful delivery of hospitality, tourism, and outdoor recreation enterprises. Business activities covered include tourism-

specific marketing, market-based research and analytics, regional challenges and opportunities, business plan components, financial risk analysis, and law and policy. Restricted to ORTM majors only. *Prerequisites:* Senior standing, ORTM 3050.

4901. Human Dimensions of Outdoor Recreation and Tourism Management. 3. This course synthesizes social, environmental, and economic aspects of outdoor recreation and tourism by examining social science methods and research conducted within these spheres. This course will be an applied experience in learning how to answer the question “Why do recreationists and tourists do what they do?” Restricted to ORTM majors only. *Prerequisites:* Senior standing, ORTM 3050.

4902 Recreation Venue Operations. 3. Applied best practices of resource and facility management in conjunction with recreation use and infrastructure development and maintenance. Students will examine the importance and challenges of matching user expectations with quality amenities of both private business and resource management agencies. Students will evaluate real-world problems and opportunities. Restricted to ORTM majors only. *Prerequisites:* Senior standing, ORTM 3050.

4903. Capstone. 3. [(none)◀▶COM3] Integrates theory and practice to create solutions for real-world problems and opportunities in outdoor recreation and tourism. Industry or government sponsors will mentor projects; students will research and execute a project and share a product with direct value to the sponsor and community. Restricted to ORTM majors only. *Prerequisites:* Senior standing, ORTM 3050.

4975. Independent Study. 1-6 (Max. 6). Supervised study and investigation in topics related to students’ research. *Prerequisite:* junior standing.

4970. Internship. 1-6 (Max. 6). Provides students the potential to succeed as professional at management or higher levels in park, recreation, tourism, or related organizations. Internships are required to be at least 400 clock hours, and no fewer than 10 weeks. Please discuss the criteria and requirements of employers/sponsors and students with your advisor. restricted to ORTM majors only. *Prerequisites:* Any ORTM class and junior standing.

Geospatial Information Science and Technology

Wyoming Geographic Information Science Center
337 Agriculture C Building

Kenneth Driese, Program Director
(307)766-2532
Web site: www.uwyo.edu/WyGISC

In fall 2019, the Wyoming Geographic Information Science Center (WyGISC) began offering undergraduate and graduate courses in geospatial information science and technology under the GIST prefix. These courses provide fundamental geospatial science education to undergraduate and graduate students from across disciplines at UW and will contribute to a proposed multidisciplinary program in GIST that is being developed. Some GIST courses will eventually replace courses that have been taught under the GEOG prefix. These courses are appropriate for both science and non-science majors. They cover core geospatial concepts including Geographic Information Systems (GIS), remote sensing, spatial data analysis, spatial visualization, spatial databases, cartography, and programming.

Associate Professor:

CHEN XU, B.S. Sichuan University, China 1999; M.S. Sam Houston State University 2005; Ph.D. Texas A&M University 2010; Associate Professor of Geospatial Information Science and Technology 2019.

Academic Professionals:

SHANNON E. ALBEKE, B.A. University of Colorado, Boulder 1997; Ph.D. University of Georgia 2010. Associate Research Scientist 2019, 2010.

KENNETH L. DRIESE, B.S. University of Virginia 1981; M.S. University of Wyoming 1992; Ph.D. 2004; Senior Lecturer in Geospatial Information Science and Technology 2019, 2002.

JEFFREY D. HAMERLINCK, B.S. University of North Dakota 1988; M.P. University of Wyoming 1992; Ph.D. University of Colorado - Boulder 2011; Senior Research Scientist 2004.

PADDINGTON HODZA, BSC, University of Zimbabwe, 1994; MSC, University of Zimbabwe, 1998; Ph.D. West Virginia University, 2007; Associate Research Scientist 2016, 2013.

RAMESH SIVANPILLAI, B.Sc. Bharathiar University 1987; M.Sc. Cochin University of Science and Technology 1990; M.Phil. Bharathiar University 1992; M.S. University of Wisconsin, Green Bay 1995; Ph.D. Texas A&M University 2002; Senior Research Scientist 2012.

Proposed Geographic Information Science and Technology Degrees and Certificates

Pending program approval, GIST courses will contribute to a set of proposed undergraduate and graduate academic credentials that are described here for student information. These include a Bachelor of Science Degree in GIST, two undergraduate certificates in GIST and remote sensing, each of which contribute to the B.S. degree, a traditional Master's degree with thesis, an online professional Master's Degree without thesis, and three online graduate certificates in GIST, remote sensing, and UAS (drones).

Although program approval is pending, some GIST courses can contribute retroactively to the proposed degrees and certificates.

Drawing on domain expertise from geography, computer science, mathematics, statistics, psychology, design, and others, geospatial information science refers to the multidisciplinary research enterprise that addresses the nature of geospatial information and the application of geospatial technologies to basic scientific questions. Geospatial information technology is a specialized set of information and communication technologies that support the acquisition, management, analysis, and visualization of geo-referenced data. Examples include: geographic information systems; global navigation satellite systems; and satellite, airborne, shipboard and ground-based remote sensing and image processing systems.

Successful students in Geospatial Information Science and Technology (GIST) combine proficiency in spatial thinking and geospatial data science analysis with fluency in geographic information systems, remote sensing, data analytics, and visualization. As professionals, graduates apply their knowledge and skills in a wide range of fields, from environmental management and public health, to civil engineering and urban planning, to economic analysis and marketing.

Courses listed in degree plans that are not described in the GIST course list are under development and will be added in future catalogs as they are approved.

Geospatial Information Science and Technology (GIST) Bachelor of Science (Proposed)

The proposed Bachelor of Science degree in GIS&T will provide students with a strong education in a broad range of skills necessary for success in this growing field. This proposed degree will also require that students earn a minor in a second discipline. Evidence suggests that students with GIST skills combined with knowledge of another field enjoy increased job opportunities.

FRESHMAN YEAR: Fall		Hrs.
First-Year Seminar (FYS).....		3
GIST 1001.....		1
GIST 1100*.....		3
MATH 1400 (or MATH 1450).....		3
ENGL 1010 (COM1).....		3
Total Hours		13

FRESHMAN YEAR: Spring		Hrs.
U.S. & WY Constitutions (V).....		3
GIST 2100*.....		4
MATH 1405 (or MATH 1450).....		3
STAT 2050 or 2070.....		4
Minor Core Course.....		3
Total Hours		17

SOPHOMORE YEAR: Fall		Hrs.
Human Culture (H).....		3
GIST 2200*.....		3
GIST 2150*.....		3
Minor Core Course.....		3
Elective.....		3
Total Hours		15

SOPHOMORE YEAR: Spring		Hrs.
Human Culture (H).....		3
GIST 2250 (COM2).....		3
Minor Core Course.....		3
GIST Electives.....		6
Total Hours		15

JUNIOR YEAR: Fall		Hrs.
GIST 3111**.....		3
GIST Electives.....		6
Minor Electives.....		6
Total Hours		15

JUNIOR YEAR: Spring		Hrs.
GIST 3050.....		3
GIST Upper Division Electives.....		6
Upper Division Electives.....		3
Minor Electives.....		3
Total Hours		15

SENIOR YEAR: Fall	Hrs.
GIST 4990.....	6
GIST Upper Division Electives.....	6
Minor Electives (Upper Division).....	3
Total Hours	15
SENIOR YEAR: Spring	Hrs.
GIST Upper Division Electives.....	6
Upper Division Electives.....	6
GIST 4780 (COM3).....	3
Total Hours	15
Total Credit Hours	120

*Courses contributing to undergraduate certificate in GIST

**Course contributing to undergraduate certificate in Remote Sensing (with 6 credits of remote sensing electives)

Geospatial Information Science Master of Science with Thesis (Proposed)

The proposed Master of Science degree with thesis will be delivered mainly on the UW campus. Students will be paired with a graduate advisor who will guide their thesis research and chair their graduate committee. This degree will require a combination of core and elective courses that typically will follow the sequence outlined below for completion in 2 years.

Semester 1

- GIST 5100 Foundations of GIS&T (3)
- GIST 5150 Advanced Programming in the Spatial Sciences (3)
- GIST 5200 Geographic Visualization (3)

Semester 2

- GIST 5050 Database Design and Management (3)
- GIST 5220 Spatial Modeling and Data Analysis (3)
- GIST Elective (3)

Semester 3

- GIST Electives (9)

Semester 4

- GIST 5002 Geospatial Forum (1)
- GIST 5960 Thesis Research (4-12)

Master of Science without Thesis (Proposed)

The proposed non-thesis Master of Science Degree is a professional degree that will be delivered primarily online. It provides a pathway for both traditional students and professionals to earn a graduate credential in 2 years as outlined below.

Course sequence for Master's degree without thesis

Semester 1

- GIST 5100 Foundations of GIS&T (3) (on campus and online)
- GIST 5150 Advanced Programming in the Spatial Sciences (3) (on campus and online)
- GIST 5200 Geographic Visualization (3) (on campus and online)
- GIST 5280 Professionalism in GIS&T (1) (online)

Semester 2

- GIST 5050 Database Design and Management (3) (on campus and online)
- GIST 5220 Spatial Modeling and Data Analysis (3) (on campus and online)
- GIST Elective (3) (on campus and online)

Semester 3

- GIST 5350 Enterprise Systems (3) (online)
- GIST 5300 Web Services/Internet GIS (3) (online)
- GIST 5002 Geospatial Forum (1) (on campus and online)
- GIST Electives (3) (on campus and online)

Semester 4

- GIST 5780 Capstone (3)

Graduate Certificates (Proposed)

Graduate certificates provide a means for students and professionals to earn marketable credentials over the course of 1-2 semesters. These certificates require a combination of core and elective courses as outlined below, and will be delivered primarily online.

Graduate Certificate in Geospatial Information Science and Technology (15 credits)

Core (6 credits)

- GIST 5100 Foundations of GIS&T (3)
- GIST 5220 Spatial Modeling and Data Analysis (3)

Electives (9 credits)

Choose from other GIST courses (see M.S. courses) or interdisciplinary courses

Graduate Certificate in Remote Sensing (15 credits)

Core (6 credits)

- BOT/GIST 5111 Introduction to Remote Sensing of the Environment (3)
- GIST 5120 Integrating Remote Sensing and GIS (3)

Electives (9 credits)

Choose from other remote sensing and UAS courses or interdisciplinary RS courses

Graduate Certificate in Unmanned Aerial Systems (8-11 credits)

Core (8 credits)

- GIST 5410 UAS Sensors and Platforms (1)
- GIST 5420 UAS Mission Planning (1)
- GIST 5430 UAS Regulations and Safety (1)
- *GIST 5440 Ground and UAS Operations (2)
- *GIST 5450 UAS Photogrammetry and Digital Image Processing (3)

Electives (3 credits) (may be optional for some graduate students, depending on their program of study)

Choose from remote sensing courses or interdisciplinary UAS applications courses

Geospatial Information Science and Technology (GIST)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB↔Q]).

1001. GIST Orientation and Portfolio. 1.

Introduces students to the GIST degree, the resources necessary to be successful in the program, and the broader geospatial field and its impact on society. Topics include a survey of domain applications, the ethical, legal and social implications of using geospatial data, and geospatial certifications and credentialing.

1100. Geospatial Foundations. 3.

Provides fundamental knowledge of geospatial information and place-based science across disciplines, including spatial representation, scale, resolution, map projections, and coordinate systems. Students learn how to discover and access spatial data and read and analyze maps. Supports understanding of geospatial reasoning and cognition.

2100. Introduction to Geospatial Information Science and Technology. 3.

Introductory course covering fundamental principles

of geographic information systems (GIS). Students will be introduced to both the theory and application of GIS, including GIS components, the nature of geospatial data, methods for data acquisition, database models, and GIS operations. Includes hands-on laboratory exercises using widely-used software.

2150. Introduction to Programming in Geospatial Information Science and Technology. 3. Introductory geospatial programming course covering the basic concepts and features of the Python scripting language, including data structures and functions, and the development of basic GIS scripting skills. Students implement spatial data collection, processing, and presentation methods for automating geospatial analyses.

2160. Survey of Remote Sensing Applications. 3. [(none)◆PN] This course introduces remote sensing by surveying applications across disciplines. It includes a brief overview of fundamentals followed by exploration of types of remote sensing including aerial photography, multispectral and hyperspectral satellite remote sensing, active remote sensing, and thermal remote sensing. The course also introduces remote sensing applications for global change. *Prerequisite:* USP Q; sophomore or junior class standing.

2200. Spatial Data Visualization. 3. Covers fundamental principles, concepts, and applications of spatial data visualization. Students will learn to find, understand, and act on spatial patterns, associations and trends, and to use and critique powerful graphical representations of spatial data including 3D maps, web maps, interactive graphics, and animations.

3111 [BOT 4111; GEOG 4111]. Introduction to Remote Sensing. 3. This is a combined lecture and computer lab course designed to present the physical principles of remote sensing, the application of airborne and satellite imagery to the study of the earth's surface with an emphasis on vegetation, and the hands-on application or remote sensing principles using digital image processing. *Prerequisite:* USP Q.

4130 [BOT 4130]. Applied Remote Sensing for Agricultural Management. 3. Covers remote sensing concepts and applications related to croplands, rangelands, forests, and water. Students learn techniques for monitoring plant growth and vigor, monitoring rangelands, distinguishing invasive species, categorizing forest fires, and mapping water bodies. Students integrate remotely sensed data with other geospatial data. Dual listed with GIST 5130; cross listed with RNEW 4130 and AECL 4130. *Prerequisites:* QA/Q course and 9 credit hours in student's major field and junior/senior standing.

4211 [BOT 4211; GEOG 4211]. Advanced Remote Sensing. 3. On-campus and online course including lecture and digital image processing lab. Explores advanced remote sensing techniques including high spatial and spectral resolution data analysis, active remote sensing (radar and lidar), and advanced image classification. Other advanced topics may be discussed as needed. Dual listed with GIST 5211. *Prerequisite:* GIST 3111 or GIST 4130.

4410. UAS Sensors and Platforms. 1. This 1-credit online course taught over 8 weeks provides a detailed overview of the types of drones used for modern remote sensing and of the sensors that can be used with these different drone platforms to collect data, including RGB and multi-spectral cameras, thermal sensors, and lidar. Dual listed with GIST 5410.

4420. UAS Mission Planning. 1. This 1-credit online course taught over 8 weeks provides a detailed overview of mission planning for UAS (drone) data collection. Students learn to evaluate mission requirements for a variety of UAS applications, to choose appropriate hardware to accomplish these requirements, and to use mission planning software to translate requirements into flight plans and data collection strategies. Dual listed with GIST 5420.

4430. UAS Regulations and Safety. 1. This 1-credit online course taught over 8 weeks provides students with a detailed overview of federal, state, and local regulations pertaining to UAS flights and data collection. Students also learn about how to operate drones safely in both personal and professional applications. Course content helps prepare students for FAA remote pilot certification. Dual listed with GIST 5430.

4440. UAS Ground School and Operations. 2. This field course provides students with the practical experience to operate UAS (drones) safely, legally, and effectively for collecting data to be used in a variety of applications. Students learn about pertinent safety and regulations, and then spend much of the course time flying drones in the field and collecting data. Dual listed with GIST 5440.

4450. UAS Photogrammetry and Image Process. 3. This 3-credit online course provides overviews of the photogrammetric principles related to imagery acquired by unmanned aerial vehicles or drones, and the image processing techniques used for extracting information from the drone images. Students will gain experience in processing drone imagery collected with RGB cameras and multi-spectral sensors. Dual listed with GIST 5450. *Prerequisite:* Junior/Senior standing or approval from the instructor.

4790. Special Topics in Geospatial Information Science and Technology. 3. Advanced and specialized topics in GIS&T are addressed through guided student discussions of current literature and possible hands-on analyses. Dual listed with GIST 5790.

4870. Internship in Geospatial Information Science and Technology. 1-12 (Max. 12). Provide undergraduates with the opportunity to receive credit for practical experience in geospatial information science and technology. Internship opportunities must be approved by faculty and work supervisors. Satisfactory/Unsatisfactory only.

4950. Undergraduate Research in Geospatial Information Science and Technology. 1-6 (Max. 6). Undergraduate research in Geospatial Information Science and Technology (GIST) under the mentorship of UW faculty. Students are encouraged to present their research at professional meetings and to publish their work. GIST is multidisciplinary, so research problems span a wide range of topics.

5002. Geospatial Forum. 1. Students attend a geospatial sciences speaker series and contribute by presenting their proposed or completed research to faculty and other students in a professional manner analogous to presenting scientific research at professional meetings. Satisfactory/Unsatisfactory only.

5100. Foundations of Geospatial Information Science and Technology. 3. This online and on-campus graduate-level course provides an introduction to key concepts in geospatial information science and technology (GIST) including spatial data structures, coordinate systems, cartographic principles, spatial analysis, modeling, spatial cognition, and applications of GIS in a multidisciplinary context. Lecture and project-based (poster).

5111 [BOT 5111; GEOG 5111]. Introduction to Remote Sensing. 3. Combined online lecture and laboratory course introduces students to fundamental principles and techniques of remote sensing and the application of digital satellite and aerial imagery to the study of the earth's surface. Includes hands-on application of digital imaging processing techniques discussed in lecture.

5120. Integration of RS and GIS Data. 3. Many geospatial analyses involve combining remotely sensed (RS) data and products with other geospatial data stored in GIS. This 3-credit online course will overview the topics pertaining to the integration of RS data in raster format with GIS data stored in vector format. *Prerequisite:* graduate standing.

5130 [BOT 5130; RNEW 5130] Applied Remote Sensing for Agricultural Management. 3. Covers remote sensing concepts and applications related to croplands, rangelands, forests, and water. Students learn techniques for monitoring plant growth and vigor, monitoring rangelands, distinguishing invasive species, categorizing forest fires, and mapping water bodies. Students integrate remotely sensed data with other geospatial data. Dual listed with GIST 4130.

5150. Advanced Programming in Spatial Sciences. 3. Introduces GIS programming to motivated students with little or no prior experience in programming; students develop programming skills used to understand geospatial data and to model geographical changes. Programming skills for handling emerging data types are emphasized.

5200. Geographic Visualization. 3. This online lecture and lab course emphasizes advanced theory and hands-on practice for creating applying interactive, dynamic, and multidimensional graphical representations of geographic data. Students will be introduced to web programming to allow them to develop mobile and online visualization tools.

5211 [BOT 5211; GEOG 5211]. Advanced Remote Sensing. 3. On-campus and online course including lecture and digital image processing lab. Explores advanced remote sensing techniques including high spatial and spectral resolution data analysis, active remote sensing (radar and lidar), and advanced image classification. Other advanced topics may be discussed as needed. Dual listed with GIST 4211. *Prerequisite:* GIST 5111 or GIST 5130.

5410. UAS Sensors and Platforms. 1. This 1-credit online course taught over 8 weeks provides a detailed overview of the types of drones used for modern remote sensing and of the sensors that can be used with these different drone platforms to collect data, including RGB and multi-spectral cameras, thermal sensors, and lidar. Dual listed with GIST 4410.

5420. UAS Mission Planning. 1. This 1-credit online course provides a detailed overview of mission planning for UAS (drone) data collection. Students learn to evaluate mission requirements for a variety of UAS applications, to choose appropriate hardware to accomplish these requirements, and to use mission planning software to translate requirements into flight plans and data collection strategies. Dual listed with GIST 4420.

5430. UAS Regulations and Safety. 1. This 1-credit online course taught over 8 weeks provides students with a detailed overview of federal, state, and local regulations pertaining to UAS flights and data collection. Students also learn about how to operate drones safely in both personal and professional applications. Course content helps prepare students for FAA remote pilot certification. Dual listed with GIST 4430.

5440. UAS Ground School and Operations. 2. This field course provides students with the practical experience to operate UAS (drones) safely, legally, and effectively for collecting data to be used in a variety of applications. Students learn about pertinent safety and regulations, and then spend much of the course time flying drones in the field and collecting data. Dual listed with GIST 4440.

5450. UAS Photogrammetry and Imagery Process. 3. This 3-credit online course provides overviews of the photogrammetric principles related to imagery data acquired by unmanned aerial vehicles or drones, and the image processing techniques used for extracting information from the drone images. Students will gain experience in processing drone imagery collected with RGB cameras and multi-spectral sensors. Dual listed with GIST 4450. *Prerequisite:* graduate standing or approval from the instructor.

5790. Special Topics in Geospatial Information Science and Technology. 3. Advanced and specialized topics in GIS&T are addressed through guided student discussions of current literature and possible hands-on analyses. Dual listed with GIST 4790.

Information Literacy

Coe Library 304

Phone: (307)766-2070

The University Libraries offer research assistance and information literacy instruction to students and faculty. Librarians provide customized class orientations to information sources in various disciplines, as well as individual research consultations. Students needing research help may call, email, instant message, or visit any library branch.

The University of Wyoming addresses information competencies utilizing the [Framework for Information Literacy for Higher Education](#) as approved by the Association of College & Research Libraries (ACRL) and endorsed by the American Association for Higher Education. Librarians collaborate with teaching faculty in addressing these information competencies in course assignments or lectures. Information literacy is the ability to recognize and define the need for information, then locate, evaluate, and use that information effectively and ethically.

Information literacy learning outcomes are included in University Studies First Year Seminar (FYS) and communication courses.

The Libraries also offer credit courses to help students improve research skills and to meet the communications 2 requirement of the University Studies Program.

Learning Outcomes

We expect that students completing LBRY courses will become knowledgeable consumers of information through learning how to:

1. Recognize and define the need for information;
2. Efficiently locate information in the library or on the Internet;
3. Evaluate the quality of information;
4. Utilize information effectively, ethically, and legally.

Librarian

TAMSEN EMERSON HERT, B.A. Colorado State University 1979; M.L.S. Emporia State University 1984; M.A. 1988; Librarian, 2014, 1986.

DAVID D. KRUGER, B.S. South Dakota State University 1991; B.S.Ed. Minot State University 1994; M.A. Kansas State University 1996; M.L.S. University of Missouri at Columbia 1998; Librarian 2016, 1998.

Associate Librarians

KAIJSA J. CALKINS, B.A. University of Washington, Bothell 2001, M.L.I.S. University of Washington, Seattle 2004; Associate Librarian 2012, 2006.

LAWRENCE O. SCHMIDT, B.S. Montana State University 1987; M.S. 1995; M.L.S. Emporia State University 2002; Associate Librarian 2008, 2002.

YOLANDA HOOD, B.A. Elon College 1993; M.A. North Carolina Central 1996; M.L.S. North Carolina Central 2004; Ph.D. University of Missouri 2000; Associate Librarian 2019.

Assistant Librarian

KRISTINA A. CLEMENT, B.A. University of Kansas 2007; M.A. University of Notre Dame 2010; M.S.I.S. University of Tennessee 2018; Assistant Librarian 2018.

MICHELLE P. GREEN, B.S. Oral Roberts University 2008; M.A. 2011; M.L.I.S. University of Oklahoma 2016; Assistant Librarian 2018.

JUDITH E. PASEK, B.S. University of Michigan Ann Arbor 1977; M.S. University of Missouri 1980; Ph.D. University of Nebraska 1987; M.L.I.S. Wayne State University 2013; Assistant Librarian 2013.

SAMANTHA PETER, B.A. University of Wyoming 2016; M.S.I.S. University of Texas at Austin 2018; Assistant Librarian 2018.

Information Literacy (LBRY)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

3010. Research from a Distance. 1. [L♦(none)] Students locate, evaluate, and synthesize free and fee-based information resources used in academic and work environments, with a special focus on accessing information remotely. Course assignments are customized to student's academic major and career goals. Students discuss ethical and legal issues surrounding information use. *Prerequisites:* ENGL 1010 or equivalent, junior standing.

3020. Research as Social Capital. 3. [L♦COM2] Prepares students to be critical thinkers and interdisciplinary researchers. Skills and habits of mind taught will enable students to locate, interact with, and present information in a service-learning framework and around the class theme of social capital, preparing them for university-level research and life after graduation. *Prerequisite:* Successful completion of a COM1 course or equivalent.

5600. Research Data Management. 3. A general approach to research data management for graduate students and researchers. Topics include: the case for data management, data management planning, meeting grant requirements, formatting and organizing, storing and transferring, legal and ethical issues, strategies for research teams, sharing data, and publishing, citing, and rights to research data. Cross listed with ES/GRAD 5600. *Prerequisite:* graduate standing.

Intercollegiate Athletics

Fieldhouse North

Thomas K. Burman, Director

Phone: (307)766-2292 FAX: (307)766-5414

Web site: wyomingathletics.com

BRYAN BERRYHILL, B.S. Colorado State University 2001; Head Track and Field/Cross Country Coach 2012.

CRAIG P. BOHL, B.S. University of Nebraska-Lincoln 1982; Head Football Coach 2014.

MATTHEW ERIC BOYER, O.D., B.S. Missouri Southern State College 1994; O.D. Oklahoma State University College of Osteopathic Medicine 1998; Sports Medicine Fellowship via College of Osteopathic Medicine Virginia Polytechnic Institute and State University 2010; Team Physician 2015.

THOMAS K. BURMAN, B.S. University of Wyoming 1988; M.B.A. Robert Morris University 1991; Director of Intercollegiate Athletics 2006.

MARK P. BRANCH, B.S. Oklahoma State University 1997; Masters in Athletic Administration 1999; Head Wrestling Coach 2008.

CHAD CALLIHAN, B.S. Radford University 2001; Head Women's Volleyball Coach 2013.

EDGAR DEAN CLOWER, B.A. Lamar University 2005; Head Women's Tennis Coach 2012.

DANIELLE COLE, A.A. S. Laramie County Community College 2013; Director of Spirit Programs and Community Outreach 2019.

MICHAEL COTTERMAN, B.S. Ohio University 1996; M.Ed. 1998; Director of Sports Performance - Olympic Sports 2015.

PETER CUADRADO, B.A. Texas Christian University 2000; M.L.A. Valparaiso University 2002; Head Women's Soccer Coach 2012.

DAVE DENNISTON, B.A. Auburn University 2002; Head Swimming and Diving Coach 2017.

TYSON DREW, B.A. University of Idaho 2004; M.S. 2007; Associate Athletic Director for Facilities and Event Management 2013.

ALLEN EDWARDS, B.A. University of Kentucky 1998; Head Men's Basketball Coach 2016.

TIMOTHY J. HARKINS, B.S. University of Kansas 1984; M.S. University of Tulsa 1992; Associate Athletic Director Media/Public Relations 2007, 1991.

BEN IANNACCHIONE, B.A. Boise State University 2008; M.S. Louisiana State University 2012; Director of Sports Performance - Football 2018.

FLOYD JOSEPH JENSEN, B.S. University of Wyoming 1998; Head Men's Golf Coach 2002.

CHINA JUDE, B.A. Alabama State University 1994; M.S. United States Sports Academy 1996; Ed.D. Northcentral University 2017; Senior Associate Athletics Director for Administration/Senior Woman Administrator (SWA) 2018.

SCOTT KNERR, B.S. Ball State University 1995; M.S. University of Utah 1995; Director of Sports Medicine 2019.

KEVIN McKINNEY, B.S. University of Wyoming 1971; Senior Associate Athletic Director for External Operations 1972.

GERALD MATTINSON, B.S. Weber State University 1981; M.S. United States Sports Academy 1988; Head Women's Basketball Coach 2019.

LONNIE PENNER, B.S. Kansas State University 2015; M.S. Liberty University 2017; Assistant Athletic Director for Marketing and Branding 2018.

BRAD POE, B.S. University of Idaho 2003; General Manager Wyoming Sport Properties 2013.

PETER PRIGGE, B.A. Marquette University 2009; J.D. 2012; Assistant Athletic Director for Compliance 2012.

ALBERT REISER, B.A. Lawrence University 2001; M.S. Indiana University 2006; M.S. 2008; Assistant Athletic Director/Academic Services 2014.

DEREK SHOOK, B.A. Appalachian State University 2012; M.S. University of Northern Colorado 2015; Associate Athletic Director for Development 2019.

BILL SPARKS, B.S. Marshall University 1979; M.S. University of Georgia 1993; Sr. Associate Athletic Director for Business Operations 1998.

JOSEY STENDER, B.S. University of Memphis 2001; M.S. 2004; Head Women's Golf Coach 2005.

TAYLOR STUEMKY, B.S. University of Northern Colorado 2010; M.S. Kansas State University 2013; Assistant Athletic Director for Student-Athlete Success 2018.

JOE VERSCHUEREN, B.A. Hope College 2004; M.S. Valparaiso University 2006; Associate Athletic Director for Ticketing and Sales 2017.

RANDY WELNIAK, B.S. University of Wyoming 1988; M.B.A. 1989; Senior Associate Athletic Director for Development and Revenue Enhancement 2011.

MATTHEW J. WHISENANT, B.S. East Tennessee State University 1996; M.A. 1999; Deputy Director of Athletics 2002.

PHILLIP WILLE, B.A. Valparaiso University 2002; J.D. 2005; Senior Associate Athletic Director for Internal Operations 2012.

Mission Statement

The University of Wyoming Department of Intercollegiate Athletics is committed to the development of tomorrow's leaders by creating an environment that promotes personal growth, academic and athletic excellence in a progressive, inclusive, and transparent manner. The Department of Intercollegiate Athletics will support the overall University of Wyoming mission, provide an outstanding fan experience, encourage community engagement, and serve as a source of pride for alumni, supporters, and the state of Wyoming.

Guiding Principles

- **Dedication to Student-Athletes:** We will promote the well-being of student-athletes and provide opportunities for academic, athletic, and personal success. We will foster academic excellence, graduate student-athletes, support their development as citizens, and prepare them to be leaders.
- **Integrity:** We will demonstrate integrity in all areas. We are dedicated to financial stability, rules compliance, diversity, and personal accountability.
- **Respect:** We will celebrate a climate of mutual respect, inclusiveness, loyalty, and sportsmanship by recognizing contributions to our teams, our department, and the university.
- **Competitive Success:** We will endeavor to be the very best when representing the University of Wyoming and our state. We are committed to providing the resources and personnel for our teams to achieve success.
- **Tradition:** The legacy of the University of Wyoming athletics is proud and strong. We will honor our outstanding tradition.
- **Excellence:** We believe in a spirit of comprehensive excellence. We will strive for excellence in all we do.

General Information

The University of Wyoming Department of Intercollegiate Athletics (DIA) consists of 17 teams competing at the NCAA Division I level: men's and women's basketball, men's and women's cross country, football (FBS), men's and women's golf, women's soccer, men's and women's swimming, women's tennis, women's volleyball, men's and women's indoor track, men's and women's outdoor track and wrestling. All sports are fully-funded up to the NCAA maximum for grant-in-aids (i.e., scholarships).

The University of Wyoming competes in the Mountain West Conference (MWC), the Western Athletic Conference (WAC), and the Big 12 Conference. In addition to the University of Wyoming the MWC consists of the U.S. Air Force Academy, Boise State University, Colorado State University, University of Nevada-Las Vegas, University of New Mexico, and San Diego State University.

The DIA is managed by the Director of Intercollegiate Athletics who reports directly to the President of the University. The Director of Intercollegiate Athletics ensures the department operates in a manner consistent with the rules and regulations of the University, the MWC and the NCAA.

*For additional information please visit the University's official athletic website at: www.gowyo.com

National Outdoor Leadership School

Administered by the Haub School of Environment and Natural Resources

Bim Kendall House

Haub School Advising Center

Phone: (307)766-5080 FAX: (307)766-5099; Web site: www.uwyo.edu/haub

The University of Wyoming (UW) and National Outdoor Leadership School (NOLS) Articulation Agreement provides the opportunity for UW students to receive UW academic credit for NOLS courses.

When NOLS students step into the world's wild places, they bring not only their backpacks, but also more than 40 years of experience in expeditioning. NOLS founder Paul Petzoldt's idea was simple: take people into the wilderness for an extended period of time, teach them the right things, feed them well and when they walk out of the mountains, they will be skilled leaders. The core of his idea was the extended expedition, one of sufficient length that a person could learn and practice the skills over and over again. That is the backbone of every NOLS course and today the school is widely recognized as the world's leader in the extended expedition, from two weeks to twelve.

This articulation agreement covers domestic and international NOLS courses. This agreement also covers some individual short-term courses (14 days or less; including mountaineering, rock climbing, sailing, kayaking, skiing, snowboarding, and backpacking) and the Wilderness First Responder (WFR) course.

Application/Eligibility

Current UW students, or students who have been fully or conditionally admitted to UW may receive articulated NOLS credit. Students who have already taken a NOLS course cannot receive credit retroactively (i.e. if a student embarked on a NOLS course and requested to get credit after the course was completed).

Credit and Credit Transfer

UW credit hours will be awarded in the approved courses, which require prior approval. Upon completion of the NOLS courses, provided a grade equivalent to a UW grade of C or better was obtained at NOLS. These UW course grades will be included in your UW GPA. Students who withdraw or are expelled from a NOLS course may receive an incomplete or an F for all enrolled UW credit.

Students should be aware that for internship credits to be awarded, additional academic work requirements determined by the intern-

ship course will need to be met. Those additional requirements vary between academic programs and amount of credit desired, but may include a satisfactory evaluation from NOLS, a weekly journal, a substantial written report, and an oral presentation. Internship requirements are established prior to your participating in the NOLS course.

Academic Advising

Prior to participating in a NOLS course for UW credit, students must make an appointment with the Haub School by emailing haub.school@uwyo.edu or calling (307) 766-5080. If your academic program is outside of the Haub School, students should also meet with their assigned academic advisor to determine if these courses will count towards their major. The Haub School will approve the student's schedule, provide the appropriate course numbers, and liaise with the NOLS Registrar.

Financial Arrangements

Each UW student will pay to NOLS:

- The NOLS tuition and related fees (any changes to be advised in writing by NOLS at least three months in advance of the change coming into effect), related fees would include equipment deposit;
- Complete medical and evacuation health insurance;
- Other fees (e.g. tuition protection program, local transportation, and gear purchases), air transportation and additional living expenses will be paid directly by the student to the provider of the service.

Each UW student will pay to UW:

- The published per credit registration fees to register UW credits earned at NOLS

Financial Aid

Students enrolled in the NOLS program may apply their financial aid to the cost of the program if they are enrolled as a full-time degree seeking student at the University of Wyoming. To do so, please work with the UW Scholarships and Student Financial Aid Office, Christy Nordmann, Financial Aid Specialist, (307) 766-3674.

Rules, Law, and Regulations

UW students studying at NOLS will be bound by all rules, regulations and by-laws in operation at NOLS. In addition, since UW students remain enrolled as degree candidates at UW, they must also adhere to UW standards of conduct, rules and regulations. UW and NOLS both abide by the Federal Right to Privacy Act (FERPA).

Steps to Follow

1. Determine the NOLS course that best fits your needs/interests and/or goals online at: www.nols.edu/courses
2. Make an appointment with an advisor from the Haub School to determine the UW academic credit that best suits your degree program by e-mailing haub.school@uwyo.edu or by calling (307) 766-5080.
3. Meet with your academic advisor (if your academic program is not in the Haub School).
4. Apply and be admitted into NOLS.
5. Prior to leaving for your NOLS course, enroll in the credit offered for the course.
6. Secure your financial aid (if any) with the UW Student Financial Aid Office, Christy Nordmann, Financial Aid Specialist, (307) 766-3674.
7. Attend and successfully complete the course (grade C or better).
8. Grades will be posted the semester of completion of your course.

UW Credit Options

UW recognizes the following credit options for taking a NOLS course:

	Hrs.
Short Courses (<14 days).....	2
**ENR 4960 (2 credits)	
Quarter length courses (14-65 days)	≤9
**ENR 2800 (3 credits)	
**ENR 4960 (3 credits)	
**ENR 4890 (3 credits)	
**ENR 4970 (3 credits)	

Semester & year-long
courses* (>65 days)12-24
**ENR 2800 (3 credits)
**ENR 4960 (6 credits)
**ENR 4970 (3-6 credits)
**ENR 4890 (3 credits)
***ENR 3900 (2 credits)
*For year-long courses, independent study
credits are also available.
**There are additional course requirements
for 4000-level NOLS credit. Syllabi and course
expectations will be shared upon enrollment.
***For courses with a Wilderness First Re-
sponder component only.

School of Energy Resources

301 Energy Innovation Center

Phone: (307)766-6879 FAX (307)766-6701

Holly Krutka, Executive Director

Web site: www.uwyo.edu/ser

The School of Energy Resources facilitates interdisciplinary academic and research programs in engineering and science, economics, and environment and natural resources policy to address critical energy-related issues faced by our society.

Our mission is to leverage and add to the already significant energy-related talent and resources in the University of Wyoming colleges to develop human resources, know-how, and technical solutions to ensure a secure and sustainable energy future for the state, region, and nation.

Professors:

TIMOTHY J. CONSIDINE, B.A. Loyola University 1975; M.S. Purdue University 1977; Ph.D. Cornell University 1981; SER Professor of Energy Economics 2008.

CRAIG C. DOUGLAS, A.B. Chicago University 1977; M.S. Yale University 1978; M.Phil. 1980; Ph.D. 1982; SER Professor of Mathematics 2008.

MAOHONG FAN, B.S. Wuhan University of Science and Engineering, 1984; M.S. Beijing University of Science and Technology, 1992; Ph.D. Chinese Academy of Sciences, 1997; Ph.D. Iowa State University, 2000; Ph.D. Osaka University 2003; SER Professor of Chemical Engineering 2015, 2008.

JOHN P. KASZUBA, B.S. Beloit College, 1982; M.S. Virginia Polytechnic Institute & State University 1986; Ph.D. Colorado School of Mines, 1997; SER Professor Geology & Geophysics, 2019, 2008.

SUBHASHIS MALLICK, B.Sc. Indian Institute of Technology 1976; M.Sc. 1978; Ph.D. University of Hawaii 1987; SER Professor of Geology & Geophysics 2008.

BRUCE A. PARKINSON, B.S. Iowa State University 1972; Ph.D. California Institute of Technology 1977; SER Professor of Chemistry 2008.

MOHAMMAD PIRI, B.Sc. Azad University, Arak 1995; M.Sc. Azad University, Tehran 1998; M.Sc. Imperial College, London 2000; Ph.D. 2004; SER Professor of Petroleum Engineering 2011, 2005.

Associate Professors:

PO CHEN, B.S. Beijing University 2000; Ph.D. University of Southern California 2005; SER Associate Professor of Geology and Geophysics 2014, 2008.

DARIO GRANA, B.S. University of Pavia, 2003; M.S. 2005; M.S. University of Milano Bicocca, 2006; Ph.D. Stanford University, 2013; SER Associate Professor of Geology and Geophysics 2019, 2013.

TARA RIGHETTI, B.A. University of Colorado Boulder 2005; J.D. 2007; SER Associate Professor of Law 2017, 2014.

Academic Professional:

KRISTOPHER KOSKI, B.S. Colorado School of Mines, 2005; J.D. University of Wyoming, 2008; Associate Lecturer 2017.

Energy Resource Management and Development Bachelor of Science

One of the most important challenges of the 21st century will be to develop and manage energy resources in a sustainable manner. Projections show energy consumption worldwide will increase nearly 50 percent by 2035. And half of the leadership in the energy industries is expected to retire in the next five to ten years.

The future of energy will be characterized by increasing knowledge, relentless change, and technological innovation. As global energy industry increases in complexity, demand will dramatically grow for professionals with a multidisciplinary, entrepreneurial skill set. Future leaders must understand complex technology within the context of business, legal, social and public policy in order to create comprehensive and sustainable solutions.

The Energy Resource Management and Development (ERM&D) B.S. program is designed to fill this need through a combination of rigorous courses, real-world internships, and undergraduate research experiences. The curriculum balances depth of learning with breadth of understanding to train graduates for sustained competitive success in the energy workforce at the frontiers of knowledge and for self-directed, life-long learning. Students learn to focus on continuous improvement, constant assessment and the importance of a sense of urgency and consideration of profit motive in the energy industry

Our program emphasizes career planning and provides constant one-on-one guidance and assistance to ensure optimal workforce placement. Students are strongly encouraged to complete an industry internship (minimum GPA requirement is typically 3.000). Opportunities are also available for undergraduate re-

search, a study abroad experience or a summer field trip. Multiple events during the year connect students to energy industry professionals.

Student Learning Outcomes

The Energy Resource Management and Development Program is designed to meet the demands of the energy workforce and enhance social literacy related to complex energy issues. Competency-based learning that integrates problem solving, critical analysis of uncertain and complex issues, and constant improvement in performance are overarching components of our undergraduate program.

1. Gain appreciation and understanding of fundamental concepts of energy systems.
2. Acquire a foundational understanding of business fundamentals relative to energy companies, including organizational structure, management, entrepreneurship and international commerce.
3. Understand the legal, cultural, scientific, and technological dimensions of energy resources.
4. Demonstrate the business and professional skills necessary to engage in meaningful conversation and dialogue across written, oral and digital platforms.
5. Exhibit critical thinking and problem solving related to earth, energy, and environmental problems.
6. Appreciate the demands and responsibilities of engaged citizenship and decision making.
7. Prepare for a lifetime of ethical service to the profession.
8. Apply concepts and skills to real world problems to gain practical understanding and experience.

Professional Land Management Concentration

Develop a complex and nuanced understanding of the U.S. legal system relative to energy development, including administrative law, legislation and regulation, and the common law of property and contracts.

Required Academic Performance

The student must earn a letter grade of C or better in each course and a cumulative GPA of 2.000 or better.

Concentrations

The Energy Resource Management and Development program offers two concentrations and students must declare at least one concentration. They are professional land management and energy land and water management. The suggested course sequences are shown below.

Energy Land and Water Management Concentration**Suggested Course Sequence**

Freshman Year: Fall	Hours
First-Year Seminar (FYS).....	3
ENGL 1010 (C1).....	3
ERS 1000	3
ECON 1300 (H).....	3
MATH 2200 (Q).....	4
Total Hours	16

Freshman Year: Spring	Hours
US & Wyoming Constitution (V).....	3
Communication 2 Elective (C2) ¹	3
ECON 1020 (H).....	3
LIFE 1010 (PN).....	4
General Elective ²	3
Total Hours	16

Sophomore Year: Fall	Hours
LIFE 2023	4
REWM 2000	3
Chemistry Elective ³	4
ACCT 2010	3
Total Hours	14

Sophomore Year: Spring	Hours
SOIL 2010	4
LIFE 3400	3
GIST 1100	3
STAT 2050	4
Total Hours	14

Junior Year: Fall	Hours
REWM 2400	4
REWM 3100	3
GIST 2100	4
ERS 4120	3
Total Hours	14

Junior Year: Spring	Hours
Economics Elective ⁴	3
DSCI 4260	3
FIN 3250	3
ERS 3010	3
General Elective ²	3
Total Hours	15

Senior Year: Fall	Hours
AGEC/ENR 4550.....	3
REWM 4200	3
Data Analysis Elective ⁵	3
ENR 4750	3
General Elective ²	3
Total Hours	15

Senior Year: Spring	Hours
Communication 3 Elective ⁶	3
AGEC/ENR 4450.....	3
REWM 4710	3
REWM 4580	3
Technical Elective ⁷	3
General Elective ²	1
Total Hours	16
Total Credit Hours	120

¹Select one: COJO 2010, ECON 2400, ENGL 2005, ENR 2000, ENR 3300, ERS 2500, HP 2020, UWYO 1600

²Select four: ERS 1650, 4960, 4965, 4970, 4975, 4985, 4990; ENR 1200, 1300, 3450, 3700, 3900, 4040, 4600, 4890, 4960, 4970; GEOG 3450, 3480, 3550, 4040, 4111, 4210, 4211; LIFE 3410; GIST 2160; MGT 3410, 3420; MKT 4600; PLNT 1150; PHIL 2420; POLS 4051, 4052; REWM 4285, 4330, 4530, 4700, 4850; SOIL 4100, 4105, 4120, 4130, 4140, 4150, 4160

³Select one: CHEM 1000 Fall only, CHEM 1020 Fall, Spring or Summer

⁴Select one: ECON/ERS 3400 (preferred); AGECE 3750, 4600, 4700, 4720; ECON 4420

⁵Select one: ES 1060; ENR 4525; GEOL 4525; STAT 3050

⁶Select one: ENR concurrent majors take ENR 4900; all other students select from ENGL 4010, 4025, 4075

⁷Select one: Any 3000/4000 ENR, GEOG, SOIL, REWM, or RNEW class except ENR 4750

Professional Land Management Concentration**Suggested Course Sequence**

Freshman Year: Fall	Hours
First-Year Seminar (FYS).....	3
ECON 1300 (H).....	3
ENR 1000 (PN).....	3
MATH 2350 (Q).....	4
ENGL 1010 (C1).....	3
Total Hours	16

Freshman Year: Spring	Hours
ECON 1020 (H).....	3
US & Wyoming Constitution (V).....	3
Communication 2 Elective (C2) ¹	3
MATH 2355	4
MGT 1040	3
Total Hours	16

Sophomore Year: Fall	Hours
ACCT 2010	3
GEOL 1100 (PN).....	4
Ethics Elective ²	3
MGT 3210	3
General Elective ³	3
Total Hours	16

Sophomore Year: Spring	Hours
ACCT 2020	3
ERS 2010	2
GIST 1100	3

STAT 2050	4
General Elective ³	3
Total Hours	15

Junior Year: Fall	Hours
FIN 3250	3
GIST 2100	4
General Elective ³	6
Total Hours	13

Junior Year: Spring	Hours
ERS 4010	3
ERS 4110	3
DSCI 4260	3
Economics Elective ⁴	3
Data Analysis Elective ⁵	3
Total Hours	15

Senior Year: Fall	Hours
ENR 4750	3
ERS 4100	3
ERS 4120	3
ERS 4130	3
AGEC 4550	3
Total Hours	15

Senior Year: Spring	Hours
ERS 4105	3
ERS 4135 (C3).....	3
ERS 4985	2
AGEC 4450	3
ERS 4990	3
Total Hours	14
Total Credit Hours	120

¹Select one: COJO 2010; ECON 2400; ENGL 2005; ENR 2000; ENR 3300; ERS 2500; HP 2020; UWYO 1600

²Select one: ERS 2000; MGT 3110; PHIL/ENR 2330

³Select four: ERS 1650, 4960, 4965, 4970, 4975, 4990; ECON 1010; ENR 1200, 1300, 3450, 3700, 3900, 4040, 4600, 4890, 4960, 4970; FIN 3310, 3520; GEOG 3480, 3550, 4040, 4111, 4210, 4211; GEOL 1600, 1650, 3600, 3605; GIST 2160; LS 2100; MGT 3410, 3420, 4340, 4350, 4360; MKT 3210, 4600; PHIL 2420, POLS 4051, 4052

⁴Select one: ECON/ERS 3400 (preferred); AGECE 3750, 4600, 4700, 4720; ECON 4420

⁵Select one: ES 1060; STAT 3050

Concurrent Major in Environment and Natural Resources

A student majoring in Energy Resource Management and Development (ERM&D) program may earn a double major by completing the courses required for the Environment and Natural Resources (ENR) program in addition to the ERM&D requirements. Visit www.uwyo.edu/haub for the ENR requirements.

Minors

Students looking to create a focus for their coursework can add minors to the ERM&D program. Courses applying towards the minor must be completed with a grade of “C” or better. Visit the college or department web sites for a description of the minors.

College of Agriculture and Natural Resources

Natural Resource Economics
Rangeland Ecology and
Watershed Management
Reclamation and Restoration Ecology
Soil Science

College of Arts and Sciences

Foreign Language
International Studies
Professional Writing
Public Relations

College of Business

Accounting
Banking and Financial Services
Decision Science
Economics
Entrepreneurship
Finance
Information Management
International Business
Management
Marketing
Marketing Communication
Sustainable Business Practices

Haub School

Environment and Natural Resources
Outdoor Leadership
Sustainability

School of Energy Resources (ERS)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦PN]).

1000. Energy and Society. 3. [O♦PN] Introduces humans’ past, present, and future sources of energy and their advantages and limitations. Discusses society’s current, non-sustainable pattern of energy use from a supply and environmental perspective. Investigates the technical, environmental, political, and societal problems associated with the eventual conversion to renewable energy resources. Cross listed with ENR 1000.

1101. First-Year Seminar. 3. [(none)♦FYS]
1300. Oil: Business, Culture, and Power. 3. [CS,G♦H] A multi-disciplinary approach to understanding how oil affects the international relations and commerce. The

relationships between oil technology, social and political institutions, the unique cultures in oil-producing regions will be investigated in case studies. Cross listed with ECON 1300.
1650. The Water-Energy-Climate Nexus. 3. [(none)♦PN] Among the grand challenges facing humanity, arguably the most significant are water, energy, and climate. These issues are, however not isolated but intimately connected, i.e. water-energy-climate (WEC) nexus. Using critical thinking and problem-solving skills, the significance of the WEC nexus to humanity will be explored from STEM and non-STEM perspectives. Cross listed with GEOL 1650.

2000. Ethics & Leadership. 3. This course provides an examination of the principles and practice of (1) personal, group and organizational leadership; and (2) ethics and morals as they relate to conduct in the leadership context. *Prerequisite:* USP WA/COM1.

2010. Introduction to Land Management. 2. Provides an introduction to land management in the petroleum industry. Covers the knowledge and skills needed by land professionals including survey systems, land descriptions, mineral ownership, title examination, leases, surface use agreements, and contracts frequently used in the industry. *Prerequisites:* WA/COM1 and QA/Q.

2500. Communication Across Topics in Energy. 3. [(none)♦COM2] Students will develop interdisciplinary communication skills from an Energy Resources perspective. Communication will include oral, digital, and written forms. Audiences for communication projects will often be live, and from a variety of backgrounds. *Prerequisites:* WA/COM1.

3010. Air Quality Management. 3. Provides an overview of air quality management approaches. In this course an interdisciplinary approach is adopted that includes diverse information from physical, natural and socioeconomic systems. With consideration of global and local issues this class focuses upon the energy sector. *Prerequisites:* CHEM 1000 or CHEM 1020 and WA or COM1.

3400. Energy Markets & Policy. 3. This course provides an economic analysis of recent developments in energy markets and policies. Cross listed with ECON 3400. *Prerequisite:* ECON 1000, ECON 1010, ECON 1020, ECON 1200, ECON 1300, ECON 1400, or ERS 1300.

4010. Petroleum Exploration and Production. 3. The purpose of this course is to provide students with information and skills necessary to understand the oil and gas modeling process from exploration to production.

Topics will include geophysical exploration, seismic acquisition, geophysical modeling, reservoir characterization, reservoir production, well planning and decision making. Cross listed with GEOL 4010. *Prerequisites:* GEOL 1100; MATH 2200 or MATH 2350.

4050. Solar Energy Conversion. 3. Provides an overview of the science behind current and future solar thermal and photovoltaic technologies. Environmental aspects, legal issues and cost associated with solar energy will also be included. Cross listed with CHEM 4050. *Prerequisites:* CHEM 1030 or CHEM 1060 and PHYS 1210 or PHYS 1310 and MATH 2200. (Offered spring semester)

4100. Property I. 3. Property I addresses the nature of property ownership and the rights associated with property as well as the acquisition and transfer of ownership rights in property and the sharing of ownership rights over time, including estates, future interest, and concurrent estates. *Prerequisites:* ERS 2500 or WB/COM2.

4105. Property II. 3. Property II covers rights inherent to the ownership of property and public limitations on those rights. *Prerequisite:* ERS 4100.

4110. Law of Contracts. 3. The Law of Contracts addresses the formation of a contract and the meaning of agreements and the justification of non-performance and breach. *Prerequisites:* MGT 1040 and WB/COM2.

4120. Federal Public Land Law. 3. Federal Public Land Law addresses public interest as the central principal of public land natural resource management. The course examines the acquisition and disposition of the public domain, federal and state regulatory authority, and the management of hard rock, energy, and range resources. *Prerequisite:* ENR 4750 or concurrent enrollment or MGT 1040 and WB/COM2 or REWM 3200 or GEOL 3005.

4130. Oil and Gas Law. 3. Focuses on the basis legal rules and principles governing the ownership and development of oil and gas, derived from a combination of property, contract, administrative, tort, and constitutional law. *Prerequisites:* ERS 2010 or PETE 3200 and WB/COM2.

4135. Advanced Oil and Gas Law. 3. [(none)♦COM3] Covers oil and gas financing arrangements including farmout, JOA, and production sharing agreements, conservation and oil/gas commission practice, drilling/service agreements, downstream marketing and purchase agreements, purchase/sale of petroleum properties, and oil/gas development on federal/indian lands. Includes basic

introduction to taxation of mineral interests including depreciation, intangible drilling costs, and depletion. *Prerequisite:* ERS 4130.

4960. Energy Field Studies. 1 (Max. 2). Various facets of energy resource management and development are covered by visits to oil and gas wells, coal mines, power plants, wind farms, and other energy production and research sites. A trip is normally planned for 5 to 6 days. *Prerequisites:* WB; ERS/ENR 1000 or ECON/ERS 1300.

ERS 4965. Undergraduate Research. 1-3 (Max. 6). Research activities on an energy-related project of limited scope or as part of a laboratory project of greater scope under the advisement of a faculty member. Students will work 4 to 10 hours per week. Students will submit a written report summarizing the results of the research. *Prerequisite:* WA; SP or SE.

4970. Internship. 1-3 (Max. 3). A formalized internship designed to provide students with relevant practical experience in the energy sector allowing synthesis and application of principles in energy science to energy asset management. *Prerequisites:* ERS/ENR 1000 or ECON/ERS 1300; QB; SP or SE.

4975. Global Experience in Energy. 2-4 (Max. 4). A 1-3 month integrative energy experience in China or Australia. Students will participate, in collaboration with partnering energy professionals, in outcomes focused education and research programs designed to address globally relevant challenges. Students will gain a global perspective within the cultural context of the partner institution. *Prerequisites:* ERS/ENR 1000 or ECON/ERS 1300; QB; SP or SE.

4985. Seminar. 1-3 (Max. 3). Energy professionals, including accredited professional landmen, practicing attorneys, and other energy professionals will present a colloquium styled course to bridge conceptual content with realistic workforce focused applications. *Prerequisites:* ERS/ENR 1000 or ECON/ERS 1300 and WA and QB.

4990. Topics in Energy Resource Development and Management. 1-6 (Max. 6). Special topics in contemporary energy development and management will be offered in response to changing industry and academic demands. The specific subject matter is based on faculty requirements and workforce innovation. *Prerequisites:* QA and one of the following: SB, SP or SE course.

The Honors College provides academically ambitious students with a series of curricular and co-curricular opportunities. Through these opportunities, students gain the breadth of knowledge needed by citizens, professionals, and family members to be effective in a lifetime of stimulating and enriching pursuits. Honors students learn to write cogently for a variety of audiences in their academic disciplines and beyond. They learn to locate and use reliable information and trustworthy opinion. Through appropriate coursework, they learn how to become engaged citizens and to understand the ethnic and cultural diversity of America and the world. They learn the purposes and values of the arts, humanities, sciences and social sciences. The Capstone Project is a sustained research or creative activity through which students demonstrate what they have learned: to formulate a project independently, to develop the intellectual and creative means to complete it, and to write and speak effectively about their work. The Capstone Project is frequently used as evidence of critical thinking in graduate and career applications.

Learning Outcomes

Students graduating from the Honors College will be able to: (1) engage in problem-solving, research, and creative pursuits that utilize an interdisciplinary approach (2) articulate the value of international and diversity-focused perspectives (3) develop their own styles of leadership and service and identify meaningful opportunities for engagement in these areas and (4) create intentional pathways through career development, including utilizing internship opportunities.

Admission

Students are invited to join the college prior to their first year. First year applicants must meet at least one of the following criteria: a composite ACT score of 27, OR a combined verbal and quantitative SAT score of 1270, OR a high school GPA of 3.700.

Students who transfer to UW or join Honors as continuing UW students or as a first year spring admit to UW and who have not completed a COM1 will begin their Honors curriculum in the fall semester with Colloquium I.

The college also welcomes transfer students and current UW students with at least four semesters remaining prior to graduation. To join, these students need an overall college GPA of 3.250.

Interested high school seniors and transfer students are encouraged to come by the Honors College or to write to the Dean, The Honors College, Dept. 3413, 1000 University Ave, Laramie, WY 82071. The email address is honors@uwyo.edu.

Scholarships

The Honors College supports UW in financial aid packages for students. In keeping with the vision of Honors to facilitate an international experience, Honors provides scholarships to assist with study abroad. To be scholarship eligible, students must have a minimum cumulative 3.250 GPA. Fellowships for supporting research or creative projects for the senior thesis may also be available.

Program Requirements

To earn a minor in Honors, Honors students must complete a total of five courses in Honors and a Capstone Project. They must also graduate with a 3.250 UW GPA. Students who transfer to UW or join Honors as continuing UW students may have some of their required Honors courses waived.

The Honors curriculum immerses students in multi-disciplinary inquiry. We begin with the First Year Colloquium, a two-semester course sequence that takes a complex topic – for example, *Dreams and Reality* – and explores it with readings based in the humanities, arts, sciences, and social sciences. We enrich the course with visits to the theatre, the Art Museum, and other UW resources, building community while learning about UW. Thereafter, students enroll in three additional courses: an Honors Non-Western Perspectives course and six hours of upper division coursework in Honors that emphasize interdisciplinarity. On average, students take one honors course per year.

The Honors Experience concludes with a Capstone Project, either a paper or project, done under faculty mentorship and presented publicly. This requirement ensures that students gain creative or research experience in an area of their interest. These projects often lead to graduate studies or a special career path.

Honors College Minor Curriculum

Required Courses	Hrs.
First Year Honors Colloquium I	3
HP 1020 (COM1)	
Colloquium II	3
HP 2020 (COM2)	
Honors Non-Western Perspectives¹	3
Upper Division Interdisciplinary	
Honors Electives¹	6
Any two upper division Honors courses excluding HP 4976	

¹Must be three unique courses to meet these requirements; a single course cannot count as both the Non-Western and an Upper Division Interdisciplinary Honors Elective.

Capstone Project (creative or research-based)

Students are not required to register for a specific course to complete the Capstone Project. There is no specific Capstone Project course; students complete the project independently in coordination with a faculty mentor.

- Honors does offer an optional independent study course if desired. Up to 6 hours of credit in the optional HP 4976: Independent Study are allowed.
- HP 4976 does not meet any specific Honors coursework requirements or USP requirements.
- Students may be pursuing a major that requires a senior or capstone project, and a major specific project may also meet the requirement for the Honors College Capstone Project. Please contact the Capstone Project Coordinator for details.

Additional Requirements

Students must also graduate with a 3.250 cumulative UW GPA.

Successful completion of the program is indicated on transcripts and diplomas, and seniors are recognized at graduation ceremonies.

Preference for enrollment in Honors courses is given to Honors College students, although non-Honors students with a 3.250 GPA are encouraged to enroll if space is available. Requests for admittance must be approved by the Honors College Office.

Advising

The Honors College offers supplemental advising that supports the work that students do with their primary major advisors. Honors Advising instructs students on Honors cur-

riculum requirements and helps students select their Honors courses. Students work with their primary major advisor to plan their courses each semester and to monitor progress towards degree completion. Students cannot register for Fall or Spring classes without meeting with their primary major advisor.

Honors College (HP)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦♦Q]).

1000. Intellectual Communities. 1. [I♦♦(none)] Queries the nature, functions, and benefits of intellectual communities from the ancient world to present. *Prerequisite:* Concurrent enrollment in HP 1020, HP 1151 or HP 1161.

1020. Freshman Honors Colloquium I. 3. [WA,L♦♦COM1] Composition course. Provides innovative writing instruction to honors students while introducing works and history of Western culture. Particularly emphasizes analytical reading and writing. *Prerequisite:* participation in UW Honors College. (Offered fall semester)

1101. First-Year Seminar. 3. [(none)♦♦FYS] 1151 [1150]. Freshman Honors Colloquium I. 3. [CH,L♦♦H] Studies significant works in the history of Western civilization to the Renaissance, both in their historical context and in relation to one another. For entering freshmen who have already fulfilled the WA or COM1 requirement. *Prerequisite:* participation in the UW Honors College. (Offered fall semester)

1200. People and Policy. 3. [V♦♦(none)] This course focuses on reading American and Wyoming political documents in an historical and interdisciplinary context, and extends the discussion into the present day, situating what we know about America as a political nation, Wyoming as a political state, and ourselves as people and citizens within both our founding political documents and the history of interpretations and extensions of those documents. *Prerequisite:* participation in UW Honors College.

2020 [1160,1161]. Colloquium II. 3. [WB,O♦♦COM2] Continues study of significant works in Western and Eastern literary, scientific and philosophical traditions begun in Colloquium I. Assignments focus on using critical discourse, historical research, and textual analysis to produce effective written compositions and oral presentations. *Prerequisite:* WA.

2151, 2152, 2153 [2150]. Honors Non-Western Perspectives. 3 (2151/Max. 6, 2152/Max. 6, 2153/Max. 6). Explores issues central to human experience from perspectives of non-western peoples. Topics vary from year to year. Required of UW Honors College students. *Prerequisites:* sophomore standing and participation in UW Honors College.

3151, 3152, 3153 [3150]. Modes of Understanding. 3 (3151/Max. 6, 3152/Max. 6, 3153/Max. 6). Introduces study of nature and grounds of knowledge, its limits and validity. Examines epistemological basis of selected areas of academic thought. Topics vary from year to year. Required of UW Honors Program students. *Prerequisites:* junior standing and participation in UW Honors Program.

4151, 4152, 4153 [4150]. Senior Honor Seminar. 3 (4151/Max. 6, 4152/Max. 6, 4153/Max. 6). Asks students to confront a complex social issue, examine it from several perspectives and take a stance on some aspect of the issue. Topics vary from year to year. Required of UW Honors Program students. *Prerequisites:* senior standing and participation in UW Honors Program.

4154. Senior Honors Seminar. 3. Asks students to confront a complex social issue, examine it from several perspectives and take a stance on some aspect of the issue. Topics vary from year to year. Required of UW Honors Program students. *Prerequisites:* senior standing and participation in the UW Honors Program.

4975. Independent Study. 1-3 (Max. 6). [WC♦♦(none)] Supervised study and investigation in topics related to students' research.

4976. Independent Study. 1-3 (Max. 6). Supervised study and investigation in topics related to student's research.

4990. Topics:____. 1-3 (Max. 6). Accommodates a senior seminar series or a course offering by visiting faculty whose subject matter is not included in other course offerings. (Offered based on sufficient demand and resources)

UWYO courses are designed to help students acculturate to college life and coursework and learn key academic skills. Course content is combined with training in critical reading, academic writing, research, formal presentation, and many other emphases. UWYO courses have low student-teacher ratios in an effort to help students experience richer connection with the instructor and students in the course. Most UWYO courses imbed intellectual self-awareness within the course goals. Several UWYO courses are part of UW learning communities and provide additional opportunities for students to engage with and work together in their cohort.

UWYO (UWYO)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

1000. IC for Undeclared Students. 2. [I,L♦(none)] An introduction to the intellectual community of the University of Wyoming, information literacy, and higher education in general, and is specifically intended for students who have not yet made a decision about their college major. Students will begin to develop the critical thinking skills that are necessary in higher education and to explore the primary intellectual activities of various disciplines. Cross listed with A&S 1000.

1050. Student-Athlete Academic Success. 1. Introduces first-year student athletes to U.W. Includes an introduction to campus resources, time management and study skill techniques, exploration of learning styles, diversity topics, and strategic goal setting to be a successful student and athlete. S/U only.

1060. College Athletics and Society. 3. This course will examine the unique relationship between intercollegiate athletics and higher education, as well as intersections that occur with gender, politics, and race.

1101. First-Year Seminar. 3. [(none)♦FYS]

1105. Academic Success Skills. 1-2 (Max. 2). Designed to provide students the necessary skill set to succeed at the University and beyond. Skills covered include time management, learning styles, note taking, self-motivation and more. The 2-credit UWYO 1105 option is graded A-F; the 1 credit UWYO 1105 option is graded Satisfactory/Unsatisfactory.

1205. Student Success Services First Year Seminar. 1. [I,L♦(none)] First year students enrolled in the Student Success Services project will learn how to utilize campus resources and understand her/his interests and values and develop the ability to establish and work toward short-term and long-term career goals, apply personalized study strategies and interpret university, college, and departmental rules and regulations. *Prerequisite:* Freshman only (exclusively for students who are part of the SSS project).

1450. Critical Reflection in Intellectual Communities. 3. [I,L♦(none)] Intellectual Community course for the Synergy learning community. Supports WA reading, research, and writing activities. Provides opportunities for students to read critically, conduct primary and secondary research, investigate diversity issues, develop computer literacy, and learn about the intellectual expectations of college life. Unaffiliated with a major department.

1600. Veterans Transition Course. 1. [I,L♦COM2] Provides returning veterans skills for successful transition to college and civilian life. Reviews tools for academic success, resources available to the veteran, information on veteran related challenges, and career planning resources. Students will develop skills in written, oral, and digital communication. *Prerequisite:* Students must be a U.S. military veteran or an active duty military member. (Normally offered fall semester)

3000. Student Leadership in Supplemental Instruction. 2. Focuses on theoretical perspectives of group tutoring and peer leadership, best practices in supplemental instruction, and student reflection. Will strengthen leadership knowledge and skills and introduce effective methods for group facilitation and SI curriculum. *Prerequisite:* closed to general enrollment.

3010. Student-Athlete Leadership Skills. 1. Designed for students to gain and apply leadership skills among other topics such as healthy relationships, nutrition, budgeting, and preparing for internships. This course builds on UWYO 1050 Student-Athlete Academic Success, and prepares the student for UWYO 3050 Student-Athlete Career Preparation. Satisfactory/Unsatisfactory only. *Prerequisite:* COM1.

3050. Student-Athlete Career Prep. 1. Works with junior and senior student-athletes as they prepare to leave college and embark on their career search. Includes topics such as: resume writing, cover letter writing, practice interviews, professional attire, interview etiquette, and mental health after college athletics. Satisfactory/Unsatisfactory only. *Prerequisite:* COM2.

3600. Veterans: Campus-To-Career. 3. [(none)♦COM3] Provides veterans with skills for successful transition from campus to the global workforce. Reviews tools for career success, resources available to veterans, information on veteran related challenges, and career planning resources. Students will develop skills in written, oral, and digital communication. Students will explore web based job search platforms and attend job fairs. Course intended for U.S. military veterans or an active duty military member. *Prerequisite:* COM2.

4101. BGS Capstone Design. 3. [(none)♦COM3] The capstone course has two major focuses: encouraging you to reflect on and integrate the learning you've done on your way to this degree and offering you the chance to apply that learning towards an interesting, important problem that makes good use of your growing expertise. The course also provides you the chance to refine your career-advancement materials and to develop a stronger understanding of the norms and values of fields that interest you. *Prerequisite:* COM2.

4965. Directed Studies/Research Problems. 1-3 (Max. 12). Interdisciplinary international undergraduate research or short-term study abroad project under the supervision of a visiting faculty member. Topics and themes will vary based on the international research and study abroad opportunities available. *Prerequisites:* Completion of COM1 and consent of instructor. Undergraduate status in good academic standing. Additional prerequisites will be determined by instructor of record.

Advising Career Exploratory Studies

222 Knight Hall

Jo Chytka, Director

Phone: (307) 766-2398 FAX: (307)766-2089

Web site: www.uwyo.edu/aces/index.html

Advising Career Exploratory Studies (ACES)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB♦Q]).

1105. Academic Success Skills. 1-2. Designed to provide students the necessary skills to succeed at the University and beyond. Skills covered include time management, learning styles, note taking, self-motivation, and more. The 2-credit ACES 1105 option is graded A-F; the 1 credit ACED 1105 option is graded satisfactory/unsatisfactory only. Students must obtain instructor approval to register.

3000. Peer Advising. 3. This course is designed to help you develop the skills, understanding, competencies, and dispositions needed to be an effective peer advisor at UW. Course content will cover student development theory, interpersonal skills, UW policies/procedures, UW academic requirements, and advising approaches. *Prerequisites:* Sophomore standing, COM2, and 2.750 UW GPA.

3100. Peer Advising Internship. 1-6 (Max. 6). Designed to help you apply the skills, competencies, and dispositions that were developed in ACES 3000. The course will allow you to apply and reflect upon student development theory, interpersonal skills, UW policies/procedures, UW academic requirements, and advising approaches. Each internship credit will require a minimum of 3 hours of work per week in the ACES office. Students and the peer advising supervisor will consult in establishing individual student hours. *Prerequisites:* ACES 3000 and application to ACES Internship.

Success and Engagement Programs

105 Coe Library

April Heaney, Director

Phone: (307) 766-3448

Web site: www.uwyo.edu/learn

STEP

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB▶Q]).

1060. College Athletics and Society. 3. This course will examine the unique relationship between intercollegiate athletics and higher education, as well as intersections that occur with gender, politics, and race.

1101. First-Year Seminar. 3. [none]◁FYS

1102. Step Into College. 1. Helps students interact with UW campus resources, staff, and faculty; learn about resources for academic support and wellness; and explore academic and co-curricular opportunities for students' professional and personal interests. Restricted to new full-time, first-year freshmen. *Prerequisite:* Freshman or sophomore class standing.

1105. Academic Success Skills. 1-2. Designed to provide students the necessary skill set to succeed at the University and beyond. Skills covered include time management, learning styles, note taking, self-motivation and more. The 2-credit STEP 1105 option is graded A-F; the 1 credit STEP 1105 option is graded Satisfactory/Unsatisfactory.

3000. Student Leadership in Supplemental Instruction. 2. Focuses on theoretical perspectives of group tutoring and peer leadership, best practices in supplemental instruction, and student reflection. Will strengthen leadership knowledge and skills and introduce effective methods for group facilitation and SI curriculum. *Prerequisite:* closed to general enrollment.

English Language Center

Cheney International Center 28

Frederica Suess, Director

Phone: (307) 766-3630

Web site: www.uwyo.edu/geo/elc

Our Mission

The English Language Center serves the University of Wyoming and surrounding community by preparing non-native speakers of English linguistically, culturally, and academically to meet the requirements for success in U.S. higher education environments and to fully engage in campus life.

Our Program

The Intensive ESL Program is a full-time English language study program. Students are in class 20 hours every week for one whole semester of 15 weeks. To study in the Intensive ESL Program, students must have an F-1 Student Visa. All instructors are experienced ESL professionals and qualified with a Masters Degree or higher in TESL or a relevant field of study.

Courses

Students take three classes daily, Monday through Thursday:

- Reading & Vocabulary: College vocabulary skills, reading strategies, and study skills.
- Listening & Speaking: Pronunciation/conversation, lecture listening, note-taking skills, and academic presentations.
- Integrated Skills: Grammar-focused reading, writing, and speaking class using topics from academic content areas.

IEP Conditional Admission: Conditional admission is available for undergraduate applicants who are academically eligible but have low language proficiency scores. Students need to do 2 applications; one for IEP and one for a degree program for consideration. *Only one application fee is needed. Contact us directly if you are interested in this option: elc@uwyo.edu.

Academic English Program

English as a Second Language (ESL)

USP Codes are listed in brackets by the 2003 USP code followed by the 2015 USP code (e.g. [QB◀▶Q]).

1110 [AS 1110]. Introduction to Academic Writing Skills. 3. Designed to introduce non-native speakers of English, who do not demonstrate the required competency in writing to enter ESL 1210, to academic writing skills. Includes instruction in grammar and sentence structure, paragraph and essay writing. *Prerequisites:* TOEFL of 18 or lower; IELTS of 5 or lower.

1210 [AS 1210; ENGL 1210]. English Composition for International Students. 3. [WA◀▶COM1]. The objective is to equip international students with procedural knowledge - a set of routines that can be applied in various academic writing patterns, such as description, process analysis, argumentation and the research essay. *Prerequisites:* TOEFL Writing sub-score of 18 or higher, IELTS Writing sub-score of 5 or higher, or instructor's consent.

1310. Academic Listening for International Students. 3. This course equips non-native speakers with focused listening strategies and note-taking skills that can be applied across a variety of academic content areas and familiarizes students with discipline specific discourse patterns. *Prerequisite:* TOEFL Listening sub-score of 18 or lower IELTS subscore 5.0 or lower; or instructor's consent.

1410. Academic Reading for International Students. 3. This course equips non-native speakers with focused academic reading strategies across a variety of academic content areas, introduces the Academic Core Vocabulary lists, and familiarizes students with discipline specific discourse patterns. *Prerequisite:* TOEFL Reading subscore of 18 or lower, IELTS Reading subscore of 5.0 or lower, or instructor's consent.

2110 [AS 2110; ENGL 2110]. English Oral Skills. 3. Instruction for Novice to advanced Low speakers in refining English pronunciation, stress and intonation, listening comprehension, oral grammar practice and building vocabulary. Satisfactory/Unsatisfactory only. *Prerequisite:* consent of instructor.

3050. Advanced Academic Writing for International Students. 3. [WB◀▶COM2]. Through ESL learner targeted instruction, practices, and feedback, the course will emphasize and progressively develop transferrable skills for students' academic work and future professions. It will continue to build on writing skills and emphasize foundational oral and digital communication skills. *Prerequisite:* WA/COM1.

4010. Technical Writing for International Students. 3. [WC◀▶COM3]. Prepares students from a culturally diverse background for the communication demands of the 21st century. Students conduct rhetorical analysis of various audiences and purposes in order to design, develop, revise and edit disciplinary and interdisciplinary technical communications, such as reports, proposals, job applications, research related documents and oral presentations. *Prerequisites:* WA/COM1, WA/COM2, and junior standing.

5910. International TA Preparation. 4. Prepares international teaching assistants for the challenges language, culture, and instruction in the American classroom impose on them: training includes pronunciation/intonation, presentation skills, basics of methodology, understanding of cultural differences, and mock-lessons. One Oral Skills Lab hour per week is included. *Prerequisite:* graduate standing.

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- HARKIN, MICHAEL E., Anthropology
- HARMON, JENNIFER, Family and Consumer Sciences
- HARNISH, BRIAN, WySAC
- HART, ANN MARIE, Nursing
- HARTSKY, ESTHER, Communication Disorders
- HARTUNG, CYNTHIA M., Psychology
- HAVIG, KIRSTEN, Social Work
- HAYDON, MARGARET, Art
- HE, GUANGLONG, Pharmacy
- HEANEY, APRIL, English, Creative Writing, LeARN
- HEINZ, PETRA, English Language Center
- HEINZ, STEFAN, Mathematics and Statistics
- HEISE, TAMMY, Philosophy and Religious Studies
- HEITHOLT, JIM J., Plant Sciences
- HELFGOTT, ISADORA, History and American Studies
- HENKEL, SCOTT, English
- HERDT, JASCHA, School of Culture, Gender, and Social Justice
- HERT, TAMSEN L., University Libraries
- HESS, BRET W., Animal Science
- HEWLETT, JOHN, Agricultural and Applied Economics
- HICKMAN, BARBARA, School of Counseling, Leadership, Advocacy & Design
- HIDECKER, MARY JO C., Communications Disorders
- HILAIRE, MICHELLE L., Pharmacy
- HILGERT, CHRIS, Plant Sciences
- HILL, CALEB, Chemistry
- HIME, SHAWN, WySAC
- HITCHCOCK, JOHN M., Computer Science
- HIX, HARVEY, Philosophy and Religious Studies, Creative Writing
- HOBERG, JOHN O., Chemistry
- HODZA, PADDINGTON, WyGISC, Geospatial Information Science and Technology
- HOLBROOK, JOSEPH, Haub School and Environment and Natural Resources, Zoology and Physiology
- HOLLAND, JEANNE E., English
- HOLLES, JOSEPH, Chemical Engineering
- HOLMES, MALCOLM D., Sociology
- HORNECKER, JAMIE R., Pharmacy
- HOUSEAL, ANA, School of Teacher Education, Science and Mathematics Teaching Center
- HOVHANNISYAN, VARDGES, Agricultural and Applied Economics
- HOYT, LINDSAY, Law
- HSU, SANDY, Communication and Journalism
- HUFFORD, KRISTINA, Ecosystem Science and Management
- HUGHES, CYNTHIA D., University Libraries
- HULLEY, ELLIOTT, Chemistry
- HUMPHREY, NEIL F., Geology and Geophysics
- HUNT, TIFFANY, School of Counseling, Leadership, Advocacy & Design
- HUNTER, MELISSA, Pharmacy
- HUTCHENS, CHAD, University Libraries
- HUTCHISON, LINDA, School of Teacher Education
- HUYNH, XAUN-XABIER, Modern and Classical Languages
- IAMS, HELEN, Family Practice
- INGWERTSON, JENNIFER, Animal Science
- INNES, PAMELA J., Anthropology
- INOUYE, MARTHA, Science and Mathematics Teaching Center
- IRICK, ERIN, Family and Consumer Sciences
- ISAACS, BRANDON, Family Practice
- ISLAM, M. ANOWARUL, Plant Sciences
- JABBOUR, RANDA, Plant Sciences
- JACKSON, DARRELL D., Law
- JACOBS, FRANCOIS, Construction Management
- JACOBS, LANDEE, Theatre and Dance
- JAFARI, FARHAD, Mathematics and Statistics
- JAIME, ANGELA, School of Culture, Gender, and Social Justice
- JAIN, PAWAN, Accounting and Finance
- JANG-CONDELL, HANNAH, Physics and Astronomy
- JANUS, THORSTEN M., Economics
- JARMAN, MICHELLE, Wyoming Institute for Disabilities (WIND)
- JARVIS, DONALD L., Molecular Biology
- JENKINS, JAYNE M., Kinesiology and Health
- JIN, SONG, Civil and Architectural Engineering
- JOHN, BARBARA E., Geology and Geophysics
- JOHNSON, ERIC N., Accounting and Finance
- JOHNSON, EVAN C., Kinesiology and Health
- JOHNSON, JAMES A., Anthropology
- JOHNSON, PATRICK, Chemical Engineering
- JOHNSON, RAYMOND B., Family Practice
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- JONES, DAVID, Art and Art History
- JONES, DAVID L., Communication Disorders
- JONES-RITTEN, CHIAN, Agricultural and Applied Economics
- KALEN, SAM, Law
- KAMBUTU, JOHN, School of Teacher Education
- KASZUBA, JOHN P., Geology and Geophysics, School of Energy Resources
- KATO, MUNEYUKI, WySAC
- KATZMANN, JASON, School of Teacher Education
- KEITH, JILL, Family and Consumer Sciences
- KELLENNERS, THIJS, Ecosystem Science and Management
- KELLER, MARY, Philosophy and Religious Studies
- KELLEY, JONATHAN P., Zoology and Physiology
- KELLY, ALEXANDRA, History and American Studies, Anthropology
- KELLY, ROBERT L., Anthropology
- KEMPSON, DIANE A., Social Work
- KIHN, PAULA, Nursing
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- KITCHEN, RICHARD, School of Teacher Education
- KLADIANOS, JAMES, Civil and Architectural Engineering

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 KNIEVEL, MICHAEL, English
 KNIGHT, MARSHA F., Theatre and Dance
 KNISS, ANDREW, Plant Sciences
 KNOBLOCH, FRIEDA E., History and American Studies; Creative Writing
 KNOX, CHRISTINA, Mathematics and Statistics
 KOBULNICKY, HENRY A., Physics and Astronomy
 KOCKEN, GREGORY, American Heritage Center
 KONESKO, PATRICK, Theatre and Dance
 KOOIENGA, SARAH, Nursing
 KORFANTA, NICOLE, Haub School of Environment and Natural Resources
 KORNFELD, MARCEL, Anthropology
 KOSKI, KRISTOPHER, School of Energy Resources
 KOTLAREK, KATELYN, Communication Disorders
 KOTTHOFF, LARS, Computer Science
 KREISER, JENNIFER, Accounting and Finance
 KREISER, PATRICK, Management and Marketing
 KRIST, AMY, Zoology and Physiology
 KRSZJZANIEK, ERIC, Management and Marketing
 KRUEGER, BREANNA, Communication Disorders
 KRUEGER, JANELLE L., Pharmacy
 KRUEGER, KEM, Pharmacy
 KRUGER, DAVID D., University Libraries
 KSAIBATI, KHALED, Civil and Architectural Engineering
 KUBELKA, GINKA, Chemistry
 KUBICHEK, ROBERT F., Electrical and Computer Engineering
 KUSEK, ANTHONY, Air Force ROTC
 KUZNETSOVA, MARIA I., Psychology
 KVENILD, CASSANDRA, University Libraries
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 LAEGREID, WILLIAM W., Veterinary Sciences
 LAKE, SCOTT, L., Animal Science
 LAMARTINE, NICOLE C., Music
 LAN, CHAO, Computer Science
 LANDEIRA, JOY, Modern and Classical Languages
 LANDREVILLE, KRISTEN, Communication and Journalism
 LANDSVERK, RICHARD, Air Force ROTC
 LANGER, PAMELA J., Molecular Biology
 LARSON, MARY LOU, Anthropology
 LARSON, MICHELE D., Life Sciences
 LAU, KIMBERLY, Geology & Geophysics
 LAUGHLIN, DANIEL, Botany
 LEACH, MARK, Management and Marketing
 LEAR, JANET, School of Teacher Education
 LEBO, ZACHARY J., Atmospheric Science
 LEDUC, ROBERT, WYSAC
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 LEE, LONG, Mathematics and Statistics
 LEHMAN, AMANDA, University Libraries
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 LEONARD, BRIAN, Chemistry
 LEONARD, JACQUELINE, School of Teacher Education
 LEOTTI, SANDY, Social Work
 LEVY, DANIEL, Molecular Biology
 LI, DONGMEI (KATIE), Chemical Engineering
 LI, LI, Communications and Journalism
 LI, YUN, Zoology and Physiology
 LINDSTROM, GRANT L., Management and Marketing
 LINN, BECKY, Pharmacy
 LIPING, WANG, Civil and Architectural Engineering
 LIU, MATTHEW, Communication and Journalism
 LIU, RONGSONG, Mathematics and Statistics; Zoology and Physiology
 LIU, XIAOHONG, Atmospheric Science
 LIU, YANG, Mechanical Engineering
 LIVINGSTON, GREG, Management and Marketing
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 LUDDEN, PAUL A., Animal Science
 LUTZ, PAULA M., Zoology and Physiology, A&S Dean
 LYFORD, MARK, Botany, ECTL
 LYNCH, ELIZABETH, Anthropology
 LYUKSYUTOVA, ANNA, Molecular Biology
 MACAULAY, DAVID, University Libraries
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 MAHAPATRA, NEELY, Social Work
 MAHVAN, TRACY D., Pharmacy
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 MALLICK, SUBHASHIS, Geology and Geophysics, School of Energy Resources
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 MALMBERG, JENNIFER L., Veterinary Sciences
 MANN, ALLISON, Pharmacy
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 MARKLEY, BENJAMIN, Music
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 MARTINEZ DEL RIO, CARLOS, Zoology and Physiology
 MASON, CHARLES F., Economics
 MAVRIPLIS, DIMITRI J., Mechanical Engineering
 McALLISTER, TYRRELL, Mathematics and Statistics
 McBRIDE, SHAWNA, Physics and Astronomy
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 McDONALD, DAVID B., Zoology and Physiology
 McELROY, BRANDON, Geology and Geophysics
 McELWAIN, ALYSSA, Family and Consumer Sciences
 McGEE, BLAKE, Music
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 McGEE, NANCY, Nursing
 McGINITY, RICHARD C., Management and Marketing
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 McKIBBIN, CHRISTINE L., Psychology
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 McLANE, LAUREN, Criminal Justice, Law
 McLEOD, DON, Agricultural and Applied Economics
 McMANUS, PATRICK, Civil and Architectural Engineering
 MEALOR, BRIAN, Plant Sciences
 MEANS, JEFFREY D., History and American Studies
 MEANS, WARRIE J., Animal Science
 MERCIL, AMBER, Accounting and Finance
 MERKLE, BETHANN, Wyoming Cooperative Unit
 MERKLE, JEROD A., Zoology and Physiology
 MICHALEK, RUDI, Physics and Astronomy
 MILES, NOAH, Modern and Classical Languages
 MILLER, KATE C., Geology and Geophysics
 MILLER, MARCIE, Civil and Architectural Engineering
 MILLER, MICHAEL, Family Practice
 MILLER, MYRNA M., Veterinary Sciences
 MILLER, SCOTT N., Ecosystem Science and Management
 MILLER, STEVEN L., Botany
 MINCKLEY, TOM, Geology and Geophysics
 MINEAR, MEREDITH, Psychology
 MINTON, ELIZABETH, Management and Marketing
 MOLETT, STACEY, Army ROTC
 MONTEITH, KEVIN, Haub School of Environment and Natural Resources, Zoology and Physiology

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Mathematics and Statistics
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of Teacher Education
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of Counseling, Leadership,
Advocacy & Design
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and American Studies
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of Counseling, Leadership,
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Architectural Engineering
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Mechanical Engineering
- MRUK, KAREN, Pharmacy
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Architectural Engineering
- MUKNAHALLIPATNA, SURESH S.,
Electrical and Computer Engineering
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Science and Management
- MURPHY, MELISSA, Anthropology
- MURPHY, SHANE, Atmospheric Science
- MYERS, ADAM, Physics and Astronomy
- MYERS, JAMES D., Geology and Geophysics
- MYRAN, LEENA, Pharmacy
- NAGLER, AMY, Agricultural and
Applied Economics
- NAIR, SREEJAYAN, Pharmacy
- NASCHOLD, FELIX, Economics
- NAUGHTON, JONATHAN W.,
Mechanical Engineering
- NAVRATIL, AMY M., Zoology and Physiology
- NEJADMALAYERI, ALI,
Accounting and Finance
- NELSON, BURRELL, Botany
- NELSON, JESSICA, School of Culture, Gender,
and Social Justice; Anthropology
- NEWBOLD, STEPHEN, Economics
- NG, KAM, Civil and Architectural Engineering
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Teacher Education
- NGUYEN, NGA, Electrical and
Computer Engineering
- NGUYEN, THANH-NGA, Pharmacy
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Leadership, Advocacy & Design
- NICKERSON, GREGORY, Wyoming
Cooperative Unit
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Affairs, and International Studies
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Science and Management
- NIU, ZHUANG, Mathematics and Statistics
- NOBLE, KENT, Management and Marketing
- NOJABAEI, BAHAREH,
Petroleum Engineering
- NORTH, CHRISTOPHER, Life
Sciences, Botany
- NORTHROP, KATE, Creative Writing
- NORTON, JAY, Ecosystem Science
and Management
- NORTON, URSZULA, Plant Sciences
- NOVAK, DOMEN, Electrical and
Computer Engineering
- NOVOGRODSKY, NOAH B., Law
- NUNEZ, NARINA L., Psychology
- OAKEY, JOHN, Chemical Engineering
- O'BRIEN, JOHN F., Electrical and
Computer Engineering
- O'BRIEN, YELENA, Electrical and
Computer Engineering
- O'TOOLE, DONAL T., Veterinary Sciences
- OBERT, JULIA, English
- OGGERO, ELENA, Electrical and
Computer Engineering
- OHARA, NORIAKI, Civil and
Architectural Engineering
- OLER, MITCHELL, Accounting and Finance
- ONETO, STEPHANIE A.,
Management and Marketing
- OUNG, ALVIN, Pharmacy
- PAGE, ERIN, Communication Disorders
- PAGE, JAMES, Family Practice
- PAGNACCO, GUIDO, Electrical and
Computer Engineering
- PAIGE, VIRGINIA B., Ecosystem
Science and Management
- PAISLEY, STEVEN I., Animal Science
- PANTER, KAREN, Plant Sciences
- PARK, EUNSOOK, Molecular Biology
- PARKER, SYLVIA, Science and
Mathematics Teaching Center
- PARKINSON, BRUCE A., Chemistry, SER
- PARKS, DOUGLAS S., Family Practice
- PAROLIN, PETER, English,
Honors College Dean
- PARSEKIAN, ANDREW, Civil Engineering;
Geology and Geophysics
- PASEK, JUDITH E., University Libraries
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of Teacher Education
- PATTON, TRACEY OWENS, Communication
and Journalism, School of Culture,
Gender, and Social Justice
- PEARCE, AMY, Law
- PEARSON, TIMOTHY, WySAC
- PEARSON, ZOE, Geography; School
of Politics, Public Affairs, and
International Studies
- PEPPER, CAROLYN M., Psychology
- PERSON, DEBORA, Law
- PERSON, MARK, Modern and
Classical Languages
- PETERSON, C. MARK, Management
and Marketing
- PETERSON, MARNIE, Pharmacy
- PEXTON, VALERIE, English, Creative Writing
- PICCORELLI, ANNALISA,
Mathematics and Statistics
- PICCORELLI, JUSTIN, School of Politics,
Public Affairs, and International Studies
- PICKETT, BRENT, School of Politics, Public
Affairs, and International Studies
- PIERCE, MICHAEL, Physics and Astronomy
- PIERRE, JOHN W., Electrical and
Computer Engineering
- PIGNATARO, MARGARITA, School of
Culture, Gender, and Social Justice
- PIKAL, JON M., Electrical and
Computer Engineering
- PIRI, MOHAMMAD, School of Energy
Resources, Petroleum Engineering
- PISHKO, MICHAEL, Chemical Engineering
- PLUMB, TAWNIA, Law
- PORTER, CHRISTINE,
Kinesiology and Health
- PRATHER, JONATHAN, Zoology
and Physiology, Director of
Life Sciences Program
- PRATT, KARA, Zoology and Physiology
- PRICE, LINDA, Management and Marketing
- PRICE SCHULTZ, CINDY J.,
Communication and Journalism
- PRIDGEN, MARY D., Law
- PRINCE, NICHOLAS, Management
and Marketing
- PROCTOR, J'LAINE, Nursing
- PRZYGOCKI, JAMES, Music
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- QUAGGIN HARKIN, ALISON, Wyoming
Institute for Disabilities (WIND)
- RAHEL, FRANK J., Zoology and Physiology
- RAMPOLLA, PEDRO, WySAC
- RASHFORD, BENJAMIN, Agricultural
and Applied Economics
- RASKA-MILLER, KIMBERLY, Nursing
- RAULSTON, TOMMY, Accounting and Finance
- READDY, R. TUCKER,
Kinesiology and Health
- REN, JUN, Pharmacy
- RETTLER, BRADLEY, Philosophy
and Religious Studies
- REUTZEL, D. RAY, College of Education Dean
- REYNOLDS, TODD, School of
Teacher Education
- RICE, WILLIAM, Physics and Astronomy
- RICHARD, KAREN, Communication
Disorders
- RICUPERO, BRYAN, University Libraries
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- RIGGIN, GEORGE, Army ROTC
- RIGHETTI, TARA, School of
Energy Resources, Law
- RINER, NICOLE A., Music
- RITCHIE, MARK, Art and Art History
- RITTEN, JOHN, Agricultural and
Applied Economics
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- ROBERTSON, DANA, School
of Teacher Education
- ROBINSON, JIM, Accounting and Finance
- ROBISON, JASON, Law
- ROBISON, RANI, Art and Art History
- ROBISON, TIGER, Music
- ROBITAILLE, BETH, Family Practice
- RODRIGUEZ HICKS, SONIA, Modern
and Classical Languages
- ROMERO, ALAN, Law

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Institute for Disabilities (WIND)
- ROSENBLUM, AARON,
Accounting and Finance
- ROTHFUSS, HEATHER, Zoology
and Physiology
- RUBIO-WALLACE, SHERRIE, Nursing
- RUDD, WILLIAM, Wyoming Cooperative Unit
- RULE, DANIEL C., Animal Science
- RUNYON, SIMONE, Geology & Geophysics
- RUSH, LESLIE, School of Teacher Education
- RUSSEL, BAILEY, Art and Art History
- RUSSELL, CASKEY, English, School of
Culture, Gender, and Social Justice
- RUSSELL, DOUG, Art and Art History
- SAILOR, RACHEL, Art and Art History
- SANDOVAL, CORRI,
Communication Disorders
- SARAJI, SOHEIL, Petroleum Engineering
- SARANGI, DEBALIN, Plant Sciences
- SCASTA, J. DEREK, Ecosystem
Science and Management
- SCHERR, FREDERICK P., Family Practice
- SCHILLINGER, JESSICA, WySAC
- SCHMIDT, LAWRENCE O.,
University Libraries
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Teacher Education
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of Politics, Public Affairs, and
International Studies
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- SCULL, REED, School of Counseling,
Leadership, Advocacy & Design
- SEITZ, THOMAS R., School of Politics, Public
Affairs, and International Studies
- SELTING, LEIGH, Honors
College, Associate Dean
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- SHADER, BRYAN L., Mathematics
and Statistics
- SHADWELL, SHELBY, Art and Art History
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Science and Management
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Heritage Center
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and Religious Studies
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Geology and Geophysics
- SHINSTINE, DEBBIE, Civil and
Architectural Engineering
- SHOEMAKER, LAUREN, Botany
- SHOGREN, JASON F., Economics
- SHUMAN, BRYAN, Geology and Geophysics
- SIEGER, CRYSTAL, Music
- SIMPSON, JANELLE, WySAC
- SIMS, KENNETH, Geology and Geophysics
- SINGH, RESHMI, Pharmacy
- SINIFT, SHERRY, Music
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Geospatial Information
Science and Technology
- SKIBA, ALEXANDRE, Economics
- SKINNER, DONALD C., Honors College
- SKINNER, MEGAN MCGUFFEY,
Family and Consumer Sciences
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of Teacher Education
- SMALL, NANCY, English
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- SMITH, MARCI, Kinesiology and Health
- SMITH, MICHAEL R., Law
- SMITH, RONN, Management and Marketing
- SMITH, SHERRILL J., Nursing
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Environment and Natural Resources,
Agricultural and Applied Economics
- SNYDER, JAMIE, Criminal Justice
- SNIDER, JEFFERSON R., Atmospheric Science
- SOHIER, BÉNÉDICTE, Modern
and Classical Languages
- SONDGEROTH, KERRY, Veterinary Sciences
- SOTO, LILIA, History and American
Studies, School of Culture,
Gender, and Social Justice
- SPARKS, JEREMY, Aerospace Studies
- SPIKER, AMY, School of Teacher Education
- SPRAGUE, ROBERT D., Management
and Marketing
- SPROTT, DAVID, Management and
Marketing, Dean, College of Business
- SPROUT AHRENHOLTZ, TREVA,
Family and Consumer Sciences
- STAHL, PETER D., Ecosystem
Science and Management
- STANESCU, DAN, Mathematics and Statistics
- STEELE, REBECCA, Modern and
Classical Languages
- STEEVE, ROGER, Communication Disorders
- STEINKRAUS, HOLLY, Molecular Biology
- STEINMAN, BERNARD, Family
and Consumer Sciences
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- STEWART, JUSTIN, Communication
and Journalism
- STEWART, MITZI, Communication
and Journalism
- STEWART, WHIT, Animal Science
- STIDOLPH, CANDACE, Nursing
- STOELLINGER, MICHAEL,
Mechanical Engineering
- STOELLINGER, TEMPLE, Haub School of
Environment and Natural Resources, Law
- STOESZ, ERIN, Science and
Mathematics Teaching Center
- STUMP, WILLIAM, Plant Sciences
- SUN, QIAN QUAN, Zoology and Physiology
- SUROVELL, TODD, Anthropology
- SWANSON, DEREK, Civil and
Architectural Engineering
- SWAPP, SUSAN, Geology and Geophysics
- SYNAKOWSKI, EDMUND,
Physics and Astronomy
- TABLER, JENNIFER, Sociology
- TAGGART, GABEL, School of Politics, Public
Affairs, and International Studies
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Petroleum Engineering
- TAN, GANG, Civil and Architectural
Engineering
- TANG, JINKE, Physics and Astronomy
- TANNER, JENNIFER E., Civil and
Architectural Engineering
- TARWATER, COREY E., Zoology
and Physiology
- TAYLOR, MICHAEL, Chemistry
- TAYLOR, ZACHARY, School of Politics,
Public Affairs, and International Studies
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- TEKIELA, DAN, Plant Sciences
- TEMAN, ERIC, School of Counseling,
Leadership, Advocacy & Design
- TEULE, FLORENCE, UW-Casper
- THAKAR, AMIT, Neuroscience
- THAYER, DAVID, Physics and Astronomy
- THIEL, CHASE, Management and Marketing
- THOMA, AUSTIN, Communication
and Journalism
- THOMAS, JENIFER, Nursing
- THOMAS, RACHEL, Nursing
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American Heritage Center
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- THOMPSON, ROD, School of
Teacher Education
- THOMPSON-EBANKS,
VALERIE, Social Work
- THORSNESS, MARY K., Molecular Biology
- THORSNESS, PETER E., Molecular Biology
- THUNSTROM, LINDA, Economics
- THYAGARAJAN, BASKARAN, Pharmacy
- TIAN, JIFA, Physics and Astronomy
- TODD, W.D. (TREY), Zoology and Physiology
- TOELLE, BRIAN, Petroleum Engineering
- TOLO, KHAMA-BASSILI, Modern
and Classical Languages
- TOOHEY, JASON, Anthropology
- TREICK, PHILIP, Accounting and Finance
- TRELEASE-BELL, AMY, Family Practice
- TRENT, ALLEN, School of Teacher Education
- TULL, CANDACE, Nursing
- TURPEN, J. SCOTT, Music
- TURPEN, JENNIFER, Music
- URYNOWICZ, MICHAEL A., Civil
and Architectural Engineering
- VALI, GABOR, Atmospheric Science
- VAN DIEPEN, LINDA, Ecosystem
Science and Management
- VAN 'T VELD, KLAAS T., Economics
- VANDEBORGH, BETH, Music
- VANDIVER, JEREMY W., Pharmacy
- VAUGHAN, KAREN L., Ecosystem
Science and Management
- VIETTI, LAURA, Geology and Geophysics
- WACHOB, DOUG, Haub School of
Environment and Natural Resources
- WADE, CHRISTINE, Family and
Consumer Sciences

- WAGGENER, JOHN, American Heritage Center
- WAGGENER, LESLIE, American Heritage Center
- WAGNER, CATHERINE, Botany
- WALKER, PETER, History and American Studies
- WALL, DANIEL, Molecular Biology
- WALLHEAD, TRISTAN, Kinesiology and Health
- WALRATH, DAVID E., Mechanical Engineering
- WAMBEAM, RODNEY, WySAC
- WANG, LIPING, Civil and Architectural Engineering
- WANG, WENYONG, Physics and Astronomy
- WARD, JAMES, Computer Science
- WARD, NAOMI, Botany
- WARD, SETH, Philosophy and Religious Studies
- WARREN, CHRISTINA, Nursing
- WATSON, RACHEL, Chemistry
- WATSON, WILTON, Creative Writing
- WAWROUSEK, KAREN, Chemical Engineering
- WEATHERMON, RICK, Anthropology
- WEBER, WILLIAM, Mathematics and Statistics
- WEINIG, CYNTHIA, Botany, Molecular Biology
- WEISS-LEHMAN, CHRISTOPHER, Botany
- WELSH, KATHERINE MUIR, School of Teacher Education
- WESTERN, JESSICA, Haub School of Environment and Natural Resources
- WHEELOCK, ANDREW, Music
- WHITE, CLAIR, Criminal Justice
- WILCOX, KEVIN, Ecosystem Science and Management
- WILDMAN, KAREN M., Family Practice
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