**GEOL 2020 Petrology, 2 credits**

**Spring 2019**

**Lecture: Geo 216 W 9:00-9:50 AM, Lab sections meet in Geo 202**

**Instructor Information**: Dr. Simone Runyon, ESB 3010, srunyon@uwyo.edu

**Office Hours**: Tues. and Weds. 10:00-11:00, or by appointment.

**Course Prerequisites**: “C” or above in Mineralogy, GEOL 2010.

**Teaching Assistants:** Fabio Da-Prat and Nathan Swaim, office hours TBD.

**Course Description**: The purpose of this course is to learn rock identification in hand sample and thin section, recognition of features in rocks that will enable you to interpret their geologic history, and to understand the significance of their petrologic characteristics in terms of their tectonic settings. This class is designed for students to learn how to make geologic observations of igneous and metamorphic rocks and to use those observations to evaluate how those rocks formed.

**Objectives** **Include**:

1. Identification of igneous and metamorphic textures in hand sample and thin section.
2. Classification of igneous and metamorphic rocks based on textural and mineralogical characteristics.
3. Prediction of appropriate igneous and/or metamorphic suites likely to be found in varying tectonic settings.
4. Interpretation of geologic history of igneous and metamorphic rocks based on mineral assemblages and textures.

**Required Text:** B. Ronald Frost, 2012, An Introduction to Igneous, Sedimentary, and Metamorphic Rocks (v. 1.1). Available at the bookstore in the Union: bring text to class and lab.

### **Attendance policy:** Please contact the instructor before any known, UW authorized absences (see: [UW Regulation 2-108 Student Attendance Policy)](http://www.uwyo.edu/regs-policies/_files/docs/regulations-2018/uw_reg_2-108_approved_7-12-18.pdf). Make-up work will only be offered in case of illness when accompanied with appropriate documentation (documentation from physician) or UW authorized absences: these will be cleared through the Office of Student Life. Should a lecture be missed, it is the responsibility of the student to establish the content and make the necessary notes- the instructor will not provide students with replacement lectures.

## Grading and Missed Assignments:

**Labs:** There will be 11 lab assignments based on samples and maps available during lab time. Make-up work must be scheduled with the instructor and TA and must occur within one week of the missed lab. If lab assignments are late *without* a UW authorized absence, they may be turned in up to 5 days after their original due date: a 10% grade deduction will be imposed for every day the assignment is late.

**Quizzes:** Unannounced, in-class quizzes will cover material from previous lectures, reading assignments, topics from Mineralogy, and concepts covered in lab. There will be a total of 8 quizzes throughout the semester. The lowest two quiz scores will be dropped. If you miss more than two quizzes due to UW approved absences or in the case of illness with proper documentation from your physician, you may contact the instructor to arrange a make-up quiz within one week of the missed quiz. If you miss two quizzes without UW approved absence or proper documentation from your physician or illness, these will be the two dropped quiz scores. If you miss more than two quizzes without UW approved absence or proper documentation from your physician or illness, there will not be any make-up quiz offered.

**Exams:**

1. There will be a **midterm exam** which will be administered during your laboratory meeting and will cover both laboratory (using hand samples and thin section) and lecture material for the first half of the semester.
2. There will be a **final laboratory exam** given during the final laboratory meeting time covering laboratory material from the second half of the semester.
3. The **final exam** will be cumulative, covering all topics covered in lecture and themes covered in lab (but not including rock samples / thin sections).

Make-up exams will only be offered in the case of illness with proper documentation from your physician or for UW approved absences. Make-up exams must be scheduled with your instructor and must occur within one week of the missed exam. No one will be allowed to take an exam early.

**Extended Absence:** In case of anything that prevents you from attending class for an extended period, contact the Office of Student Life (307)766-3296, dos@uwyo.edu to facilitate arranging make-up work.

Grading **Final letter grades will be assigned:**

Quizzes (14 pts. each) 84 A (100-90%) 540 - 600 points

Midterm Exam 80 B (89-80%) 480 - 539 points

Labs 236 C (79-70%) 420 - 479 points

Final Laboratory Exam 100 D (69-60%) 360 - 419 points

Final exam 100 F (≤ 59%) ≤ 359 points

Total 600

**Grading Curve**: There will not be a grading curve.

**Required Participation Outside of Class Meetings:** There will be a field trip towards the end of the spring semester, weather dependent.

**Substantive changes to syllabus**: This syllabus is a guide. Any changes to the syllabus will be announced in class and posted on WyoCourses. Check WyoCourses at least once a week.

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| **Tentative Lecture schedule** | **Tentative Lab schedule** |
| Jan 30 | Composition of the Earth, rock-forming minerals | Week 1 | No lab. Review mineralogy. |
| Feb 6 | Igneous rocks: Classification | Week 2 | L1: Minerals & classification |
| Feb 13 | Tectonic settings & igneous processes  | Week 3 | L2: Tectonic settings |
| Feb 20 | Magmas: physical characteristics, petrogenesis, and phase equilibria | Week 4 | L3: Phase equilibria / fractional crystallization |
| Feb 27 | Mafic and ultramafic igneous rocks | Week 5 | L4: Mafic – ultramafic  |
| March 6 | Felsic igneous rocks | Week 6 | L5: Felsic igneous rocks |
| March 13 | Volcanic and volcaniclastic rocks | Week 7 | L6: Volcanic rocks  |
| **March 20** | **Spring break – no lecture** | **Week 8** | **Spring break – no lab** |
| March 27 | Geochemistry and igneous rocks | Week 9 | **Midterm** |
| April 3 | Metamorphism: reactions, fabrics  | Week 10 | L7: Metamorphic textures |
| April 10 | Metamorphism: regional vs. contact, tectonic significance | Week 11 | L8: Metamorphic reactions & map relationships |
| April 17 | Metamorphic facies  | Week 12 | L9: Metamorphic facies |
| April 24 | Metamorphism: Barrovian sequence | Week 13 | L10: Barrovian sequence |
| May 1 | Geothermometry & barometry: P-T-t | Week 14 | L11: P-T-t |
| May 8 | **Review** | Week 15 | **Lab final – Meta. rocks** |
| **Lecture final –** ***Cumulative***: Friday, May 17 8:00-10:00 AM |

**Classroom Behavior Policy:** Treat your presence in the classroom and your enrollment in this course as you would a job. Act professionally, arrive on time, pay attention, complete your work in a timely and professional manner, and treat all deadlines seriously. You will be respectful towards your classmates and instructor. Personal attacks, offensive language, name-calling, and dismissive gestures are not warranted in a learning atmosphere. Your instructor has the right to dismiss you from the classroom, study sessions, electronic forums, and other areas where disruptive behavior occurs. Electronic devices such as mobile phones should be set to silent. No video or audio recording during class is allowed to protect the privacy of your fellow students.

Written work should reflect a similar professional attitude. Disparaging remarks, complaints, or unprofessional language on exams/assignments/labs will result in a loss of points on those assignments.

**Academic Dishonesty Policies**: Academic dishonesty will not be tolerated in this class. Cases of academic dishonesty will be treated in accordance with UW Regulation 2-114. The penalties for academic dishonesty can include, at my discretion, an “F” on an exam, an “F” on the class component exercise, and/or an “F” in the entire course. Academic dishonesty means anything that represents someone else’s ideas as your own without attribution. It is intellectual theft – stealing - and includes (but is not limited to) unapproved assistance on examinations, plagiarism (use of any amount of another person’s writings, blog posts, publications, and other materials without attributing that material to that person with citations), or fabrication of referenced information. Facilitation of another person’s academic dishonesty is also considered academic dishonesty and will be treated identically.

Under no circumstances should you turn in an assignment, or part of an assignment, identical to another student’s work: this will be treated as plagiarism regardless of circumstances. Ignorance of these policies is not an acceptable defense against any charge of academic dishonesty. Turning in someone else’s work, or part of someone else’s work, is plagiarism – whether it be intentional or unintentional. If you have any questions about how to proper use/citation of sources, contact your instructor.

**Classroom Statement on Diversity:** The University of Wyoming values an educational environment that is diverse, equitable, and inclusive. The diversity that students and faculty bring to class, including age, country of origin, culture, disability, economic class, ethnicity, gender identity, immigration status, linguistic, political affiliation, race, religion, sexual orientation, veteran status, worldview, and other social and cultural diversity is valued, respected, and considered a resource for learning.

**Disability Support**: The University of Wyoming is committed to providing equitable access to learning opportunities for all students.If you have a disability, including but not limited to physical, learning, sensory or psychological disabilities, and would like to request accommodations in this course due to your disability, please register with and provide documentation of your disability as soon as possible to Disability Support Services (DSS), Room 128 Knight Hall, (307) 766-3073, udss@uwyo.edu. It is in the student’s best interest to request accommodations within the first week of classes, as accommodations are not retroactive. Visit the DSS website for more information at: [www.uwyo.edu/udss](http://www.uwyo.edu/udss).

**Duty to Report:** UW faculty are committed to supporting students and upholding the University’s non-discrimination policy. Under Title IX, discrimination based upon sex and gender is prohibited. If you experience an incident of sex- or gender-based discrimination, we encourage you to report it. While you may talk to a faculty member, understand that as a "Responsible Employee" of the University, the faculty member MUST report information you share about the incident to the university’s Title IX Coordinator (you may choose whether you or anyone involved is identified by name). If you would like to speak with someone who may be able to afford you privacy or confidentiality, there are people who can meet with you. Faculty can help direct you or you may find info about UW policy and resources at <http://www.uwyo.edu/reportit>. You do not have to go through the experience alone. Assistance and resources are available, and you are not required to make a formal complaint or participate in an investigation to access them.

**Student Resources:**

Disability support services: udss@uwyo.edu, 766-3073, 128 Knight Hall, [www.uwyo.edu/udss](http://www.uwyo.edu/udss)

Counseling center: uccstaff@uwyo.edu, 766-2187, 766-8989 (After hours), 341 Knight Hall, [www.uwyo.edu/ucc](http://www.uwyo.edu/ucc)

Academic affairs: 766-4286, 312 Old Main, [www.uwyo.edu/acadaffairs](http://www.uwyo.edu/acadaffairs)

Dean of Student Office: dos@uwyo.edu, 766-3296, 128 Knight Hall, [www.uwyo.edu/dos](http://www.uwyo.edu/dos)

UW Police Department: uwpd@uwyo.edu, 766-5179, 1426 E Flint St, [www.uwyo.edu/uwpd](http://www.uwyo.edu/uwpd)

Student Code of Conduct: [www.uwyo.edu/dos/conduct](http://www.uwyo.edu/dos/conduct)