

Proposal to Eliminate Academic Program

Pursuant to UW Regulation 6-43

PhD Statistics

Statement of the reasons for elimination of the program:

The Statistics department's Ph.D. accepted no new students this academic year, 2016-17; the degree should be considered for closure so that emphasis may be placed on the M.S., an invigorated B.S., and minors. Note: NO recommendation is being made to eliminate the undergraduate minor, the B.S. Statistics, or the M.S. Statistics programs.

Description of the program and relevant data:

Describe the mission, curriculum, content and format of the program:

The Ph.D. Program in Statistics provides 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.

Pre-Requisites for the Required Courses

5255 Theory of Probability
5265 Theory of Statistics
4200 Math Analysis (or Analysis for Statisticians Topics Course)
5025 Design and Analysis of Experiments
5015 Regression

Required:

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 one time. 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 advisor will be expected to form a doctoral committee. This committee will determine which courses are to be included in the student's Doctoral Program and will set the conditions for the dissertation proposal and the preliminary examination. A passing grade on the preliminary examination is mandatory for official admittance into the doctoral program by the graduate school.

(3) Once a committee is formed at a time deemed appropriate by the student, his/her adviser, and the committee, the candidate will present to the committee a proposal for dissertation research. After the committee has amended or approved the proposal, they will set terms for the preliminary examination. This examination will usually contain a written section and will always include an oral portion to demonstrate the student's research readiness.

(4) 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. It is expected that portions of the dissertation will be submitted for publication in peer reviewed journals.

Describe the role of the program within the context of the college and the mission of the University:

Increasingly the world around us, and all academic disciplines, are becoming more and more reliant and dependent upon statistics. It is as H.G. Wells predicted nearly a century ago, "Statistical thinking will one day be as necessary for efficient citizenship as the ability to read and write." Certainly this day has arrived. Today the basic principles of statistical thought and reasoning are as necessary for the understanding of sporting events and the nightly news, as they are in conducting state of the art research.

Graduates with statistical training are employed in a broad spectrum of areas, which include the business world, the sciences (biological, social, physical, and health), as well as the fields of engineering and education. There are many job opportunities for statisticians at all levels.

Financial data relevant to the academic program:

Cost data is for ENTIRE department and is not disaggregated by degree.

Ratio of student credit hours per FTE (AY 2014/15): 1,236.6

Direct instructional expenditures (FY 2015): \$1,118,035

i) Per student FTE: \$4,402

ii) Per total degrees awarded: \$223,607

iii) Non-personnel expenditures / total academic FTE: \$4,566

Course enrollment (AY 2014/15)

i) Classes falling under university minimums: 6

ii) Lower-division courses falling under university minimums: 0

Research expenditure per tenure-track FTE (FY 2015): \$46,783

Admission, enrollment and graduation data relevant to the program, including the number of students currently enrolled and the status of their progress toward graduation:

COLLEGE/DEPARTMENT Program	Doctorate/Professional Degrees Granted					Total
	2010- 11	2011- 12	2012- 13	2013- 14	2014- 15	
Statistics	2	1	2	2	1	8
Department Total	2	1	2	2	1	8

COLLEGE/DEPARTMENT Program	Doctorate/Professional Majors					Total
	Fall Semesters					
	2011	2012	2013	2014	2015	
STATISTICS						
Statistics	16	14	10	7	5	52
Department Total	16	14	10	7	5	52

Total doctoral candidate students currently in PhD Statistics Program = 4. Admissions for AY 16-17 = 0.

Describe the administration of the program:

The PhD program is administered by the Department of Statistics, College of Arts and Sciences, Department Head: Ken Gerow

Describe the faculty and academic professionals who serve in the program, including their academic credentials, academic rank and length of service to the University:

Richard Anderson-Sprecher, Ph. D. Statistics, University of Iowa.

Rank: Professor

Length of Service: 26 Years (1990)

Ken Gerow, Ph. D. Biometry, Cornell University; Head of Department.

Rank: Professor

Length of Service: 23 Years (1993)

Snehalata Huzurbazar, Ph.D. Statistics, Colorado State University.

Rank: Professor

Length of Service: 21 Years (1995)

Timothy Robinson, Ph.D. Statistics, Virginia Tech (seconded into Directorship of WWAMI since summer 2014).

Rank: Professor

Length of Service: 16 Years (2000)

Stephen Bieber, Ph.D. Quantitative Psychology, University of California-Berkeley (seconded into Directorship of WYSAC since summer 2015).

Rank: Professor

Length of Service: 37 Years (1979)

Shaun Wulff, Ph.D. Statistics, Oregon State University.

Rank: Associate Professor

Length of Service: 17 Years (1999)

Annalisa Piccorelli, Ph.D. Epidemiology and Biostatistics, Case Western Reserve University.

Rank: Assistant Professor

Length of Service: 1 Year (2015)

Scott Crawford, Ph.D. Statistics, Texas A & M University.

Rank: Assistant Lecturer

Length of Service: 4 Years (2012)

Grants Awarded to Tenured and Tenure-track faculty during AYs 2011 through 2016

Over academic years 2011-2012 through 2015-2016, department colleagues have been involved (as PI or Co-PI) on a total of \$6,792,720 in funded research.

Graduate Student Committees. Another aspect of our research/teaching activities is our role on graduate committees outside of our department. In the period encompassing calendar years 2011 through 2015, we collectively served on well over 100 such committees, supporting research across virtually all of the science departments on campus.

Grants and Contracts Awarded as PI or Co-PI to Tenured and Tenure-track faculty during AYs 2011 through 2016

Scott Crawford:

2014. \$500

Planning and Creation of First Year Seminar
UW-ECTL

Ken Gerow

2011-present \$22,000 Biostatistics Support, NPS Fire Ecologists
National Park Service

Burke Grandjean

2006-2012 \$294,000 Comprehensive Survey of the American Public
National Park Service

2011-2012 \$10,200 Arrest-related Deaths in Wyoming
US Bureau of Justice Statistics

2011-2012 \$6,100 Statistical Consulting for Environmental Monitoring
National Park Service

2011-2014 \$35,000 Building Science Capacity While Addressing Climate
Change, U.S. Fish and Wildlife Service

2011-2014 \$50,000 Modeling Support for Species Recovery
National Park Service

2012 \$13,000 International Symposium on National Parks and Climate
Change, University of Wyoming

2012-2013 \$12,800 Statistical Consulting for Environmental Monitoring
National Park Service

Snehalata Huzurbazar

2011-2016 \$750,761 Modelling and Analysis of Gene Duplication
National Science Foundation

2012-2014 \$6,800 Establishing the Feasibility of FDA for Determining the
Health Consequences of Body Weight Changes Among
Older Adults, Institute of Translational Health Sciences,
University of Washington

2013-2018 \$140,375 Clinical Translation Research Infrastructure Network
National Institute of Health

2014-2015 \$25,875 SAMSI Bioinformatics Program Research Participation
National Science Foundation

2015 \$22,000 Visualizing and Modeling vaginal microbiome data for
improved understanding of BV, National Institute of Health

2015 \$10,000 Collecting baseline data and documenting best practices for
improving recruitment and retention of diverse STEM
faculty at the University of Wyoming
UW Office of Research and Economic Development

Tim Robinson

2011-2012 \$6,100 Statistical Consulting for Environmental Monitoring
National Park Service

2011-2012 \$22,500 Developing graphical presentations of high dimension
design applications in energy research

2011-2014	\$35,000	School of Energy Resources, UW Building Science Capacity While Addressing Climate Change, U.S. Fish and Wildlife Service
2011-2014	\$15,000	Building Science Capacity to Implement Strategic Habitat Conservation While Addressing Climate Change U.S. Fish and Wildlife Service
2013-2016	\$16,700	Statistical Consulting for Environmental Monitoring National Park Service
2015-2018	\$95,114	Statistical Support for Inventory and Monitoring U.S. Fish and Wildlife Service
Shaun Wulff		
2014	\$3000	Statistical Modeling of Resilient Modulus Wyoming Department of Transportation
2014	\$10,533	Improvement to Intraoperative Hearing Assessment and Prevention of Inner-Ear Damage in Humans Oticon Research Grants
2014-2016	\$5,224,094	Atmosphere to Grid: Advanced Modeling to Enhance Energy Conversion and Delivery; Department of Energy Experimental Program to Stimulate Competitive Research

Describe the program facilities, including classrooms and offices, library and equipment used by or dedicated to the program:

No office allocations for faculty would change, as the department's undergraduate and masters' offerings will remain intact. Nevertheless, a listing of offices is below.
Offices: Ross Hall 202, 203, 222, 325, 330, 331, 332, 333, 334, 335, 336 337, 340

Classroom use is general/central pool classrooms. Instructional technology needs will remain the same, as will research technology, libraries, and facilities usage needs.

The Department has its own computer lab available to students. The central library and our department library contain excellent collections of journals and books in statistics and related areas. Cooperative research efforts between statistics and other applied areas provide many research opportunities.

Evaluations from accrediting bodies or other reviewers of the quality of the program and its faculty and academic professionals:

Not applicable.

Comparison of the program with related or similar programs:

There is no other degree program on campus at this time which is similar to this one. The remaining degrees (BS and MS) will be retained with ‘renovation’ to become more closely aligned to the more interdisciplinary areas of data science/data analytics. Several groups of researchers across campus (Botany, Geology, etc.) have individuals working in these areas. Collaborations are expected to form.

Describe the anticipated effects of elimination of the program upon the college in which the program is situated, upon other colleges and units of the University, and upon the University as a whole, including:

Effects upon students enrolled in the academic program:

All students currently active in the Ph.D. program will be allowed to finish. No new students will be enrolled; enrollment ceased with Fall 2016. Coursework should be completed within two years and dissertations written and defended in three.

Effects upon faculty and academic professionals who serve in the program, including termination of any existing positions:

Faculty and administrative professionals who serve the program will continue to teach in the BS and MS as well as provide thousands of hours of service teaching across campus at the undergraduate and graduate level.

Educational and financial effects upon other units of the University:

None. Service teaching upon which other areas of campus heavily depend will continue. New collaborations are expected to form around data science/data analytics as the BS and MS degrees are ‘renovated’ to more closely align with those interdisciplinary areas.

Effects upon faculty, academic professionals, staff, students and alumni of the University:

It is hoped that the departments’ new focus on its BS and MS, as well as the ‘renovation’ described above, will invigorate this important department. More collaborations are expected to form and an increase in service teaching is predicted (as data science/data analytics attracts even more students from other departments across campus).

Effects on the State of Wyoming, including loss of benefits conferred outside the University by the academic program:

Ph.D. graduates from this program are rarely hired in Wyoming. The new emphasis on data science/data analytics in the BS and MS is expected to produce graduates who will be hired into Wyoming industries.

Implementation plan to be followed in the event the academic program is eliminated, including:

Procedures for handling current and future applications for admission:

Current and future applicants will be informed that the program has been eliminated and is not accepting new students.

Plans for assisting currently enrolled students to complete the course of study:

All students currently active in the Ph.D. program will be allowed to finish. Students will be carefully advised to make certain that coursework is completed within two years and dissertations written and defended in three.

Plans for accommodating faculty and academic professionals who will be terminated or otherwise affected by elimination of the academic program:

No faculty or academic professionals will be terminated. All will continue to teach in the BS and MS, as well as participate in service teaching for undergraduates and graduate students across campus.