Statistics Graduate Programs

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Columbia, MO 65211
573-882-6376
http://www.stat.missouri.edu/

About Statistics

The statistics department faculty is known for both cutting edge methodological and collaborative research and for outstanding teaching. Faculty members are currently investigating statistical problems in the fields of ecology, genetics, economics, meteorology, wildlife management, epidemiology, AIDS research, geophysics, and climatology. The program’s faculty members have ongoing collaborative programs across disciplines such as biostatistics, bioinformatics, economics, atmospheric science, psychology and with the Missouri Department of Conservation.

The graduate program provides opportunities for graduate study and thesis direction in various areas of probability and statistics, both theoretical and applied. A variety of consulting and collaborative opportunities allow both faculty and graduate students to conduct cooperative and interdisciplinary research. Regular statistics colloquia provide opportunities for faculty and outside speakers to present the results of their research. Faculty and graduate students also participate in weekly seminar series in Bayesian statistics, bioinformatics, and biostatistics.

Degrees Available

- MA and PhD in statistics
- MA in statistics with emphasis in biostatistics
- Dual MA in statistics and economics

Career Opportunities

Statisticians are in demand in education, medicine, government, business and industry as well as in the biological, social and physical sciences.

Facilities & Resources

The Department of Statistics maintains a state-of-the-art computer network with Linux workstations and servers for research and personal productivity software on PCs. Students have access to the network through PCs in student offices and through the statistics department computer laboratory. An extensive library of software including R, SAS, and common programming languages is maintained. Students also have access to the campus computing network. The statistics department is located in newly renovated space in Middlebush, with easy access to the main library’s outstanding collection of books and journals in statistics.
Financial Aid from the Program

Fellowships and teaching and research assistantships are available to qualified graduate students. Some programs require an extra form or statement from those who wish to be considered for internal assistantships, fellowships or other funding packages. Check the program website or ask the program contact for details.

Statistics Faculty

Dongchu Sun
chair, professor; PhD, Purdue University

Paul L. Speckman
director of graduate studies, professor, PhD, University of California-Los Angeles.

Nancy Flournoy
professor; PhD, University of Washington.

Chong Zhuoqiong He
director of graduate admissions, professor; PhD, Purdue University.

Jianguo Sun
professor; PhD, University of Waterloo, Canada.

Christopher K. Wikle
director of undergraduate studies, professor; PhD, Iowa State University.

Sounak Chakraborty
associate professor; PhD, University of Florida.

Marco Ferreira
associate professor; PhD, Duke University.

Scott Holan
associate professor; PhD, Texas A&M University.

Athanasios Micheas
associate professor; PhD, University of Connecticut.

Jing Qiu
associate professor; PhD, Cornell University.

Lori Thombs
director of the Social Science Statistics Center, associate professor; PhD, Southern Methodist University.

Min Yang
associate professor; PhD, University of Illinois-Chicago.

Subharup Guha
assistant professor; PhD, The Ohio State University.
Tieming Ji
assistant professor, PhD, Iowa State University

Michael Robbins
assistant professor; PhD, Clemson University

Lawrence Ries
associate chair, associate teaching professor; PhD, University of Missouri.

Application and Admission Information

Admission Criteria

Fall deadline: January 15
Spring deadline: October 15

Minimum TOEFL scores:

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<th>Internet-based test (iBT)</th>
<th>Paper-based test (PBT)</th>
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<td>74</td>
<td>535</td>
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Minimum GPA: 3.0 in math and statistics courses to enter master’s program; 3.5 in math and statistics to enter PhD program

Bachelor's degree from accredited college or university in related area

Undergraduate courses in statistics are recommended but not required. Consideration also is given to rank in graduating class, trends in grade records, maturity and experience, and other criteria bearing on qualifications.

Before entering the graduate program, a student should have a background that includes three semesters of calculus (or equivalent), one semester of matrix theory, and at least one post-calculus course in probability and statistics. Some required courses at the 7000 level not taken as an undergraduate may be taken for graduate credit as part of the graduate program.

Required Application Materials

To the Graduate School:
All required Graduate School documents

To the Program:
Departmental application
3 letters of recommendation (use departmental form)
Letter of intent
GRE score report
Master of Arts in Statistics

Degree Requirements

The general requirements for receiving a master’s degree are at least 30 semester hours of course work at the 7000 level or higher, of which at least 18 hours must be from the Department of Statistics at MU. The 30 hours may not include credit hours of 7050, 7510, 7530 or 7710 or more than a total of six hours of 8090.

At least 15 semester hours of course work at the 8000 level or above must be taken from the Department of Statistics at MU. The 15 semester hours cannot include more than a total of three hours of 8090.

Additional courses recommended but not required are Statistics 7110, 7310, 7410, 7420, 7430, 7450, 7610, 7810, 7830, 7850, 7870, 8310, 8320, 8370, 8410, 8640, 9250, 9310, 9320, and 9410; Mathematics 7700 and 7900; Computer Science 1050 or 2050.

Remedial Courses

The following courses are required if equivalent courses were not taken as an undergraduate: Mathematics 7140, Statistics 7750 and 7760. These courses may not be used for more than six of the required 30 hours.

Applied Track Masters of Arts Degree

Required core courses

Students must complete the following six courses or equivalent.

- Stat 7110  Statistical software and data analysis
- Stat 7540  Experimental design
- Stat 7750  Introduction to probability theory
- Stat 7760  Statistical inference
- Stat 8310  Data Analysis I
- Stat 8320  Data Analysis II

In addition, students must take four elective courses, at least three of which must be selected from the department of statistics course offerings numbered 8000 or above.

Examination

Students in the applied track must pass written and oral master’s exams administered by a departmental committee.

Regular Track Masters of Arts Degree

Original Written Work

All candidates must submit a written report on an independent effort toward producing original work. This report may, with the adviser’s consent, take the form of a thesis, a written review on a set of papers in statistics, or a written report on an independent study project, which may include an original application of statistics. For this work, a student must register for at least three semester hours of 8090.
Presenting the Work

All candidates are required to present an open seminar on the results of the written report. The report should be made available for public review, through the Department of Statistics office, for at least one week before the examination.

Examination

The MA examination covers material presented in the written report and the seminar and may also cover course work.

Satisfactory Progress

Length of Study
A master’s candidate is expected to complete the master’s degree within three calendar years beginning with the first semester of enrollment unless approval is obtained from the graduate faculty of the Department of Statistics.

Grade Requirements
Any student, while a graduate student in this program, who receives a grade of C or lower in six or more hours of courses offered by the Department of Statistics or a grade of C or lower in nine or more hours of all courses taken will be dismissed from the graduate program unless contrary action is taken by the graduate faculty of the department.

For each credit hour over three hours with a grade of C or lower in courses offered by the Department of Statistics at the 7000 level and above, the student must receive a credit hour with a grade of A in courses offered by the department at the 7000 level and above.

MA in Statistics with Emphasis in Biostatistics

Students who wish to specialize in biostatistics may obtain a degree with special emphasis. The general requirements are the same as those for the MA degree in statistics. In addition, students must satisfy the following.

(i) Take statistics 7410 and (ii) either 7420, 8410 or 9410 or the equivalent;

(ii) Submit a project or thesis related to biostatistics.

Dual Master’s Degree in Economics and Statistics

The department offers a cooperative MA degree with the Economics Department. Students may obtain MA degrees in economics and statistics with 48 hours of course work numbered 7000 or higher from the University of Missouri instead of the 52 or more required for separate degrees. (These 48 hours may not include any of the following: Economics 7351, 7353, or Statistics 7510, 7530, 7710.) Eighteen or more hours are required from the Department of Economics. At least 15 hours must be numbered 8000 or higher with no more than four hours of 8090. Students must take the core economics courses 8451 and 8453 and research workshop 8413 (2 credit hours). Eighteen or more hours are required from the Department of Statistics. At least 15 hours must be
numbered 8000 or higher with no more than three hours of 8090. Statistics 7750 and 7760 and Mathematics 7140 are required if equivalent courses were not taken as an undergraduate.

All candidates must submit a thesis or written project demonstrating an independent effort towards producing original work satisfactory for each degree. The candidate may complete separate theses/projects for both economics and statistics or a single joint thesis/project satisfying both requirements.

**Master’s Minor**

To receive a designated minor in statistics for a master’s degree, at least 12 credit hours of course work at the 7000 level or higher must be completed from the Department of Statistics at MU. The courses should be unified in theme and must be approved by the director of graduate studies in the Department of Statistics.

The courses must be completed with an average grade of B (3.0) or higher; shall not include Statistics 7002, 7070, 7085, 8085 or 9085; and shall not include more than one course from Statistics 7710 and 7750.

**Doctorate in Statistics**

**Qualifying Examination**

The Qualifying exam will be offered to students in the statistics department doctoral program or to master’s students in statistics who are approved by the Admissions Committee. All graduate students who expect to be in the PhD program must take the qualifying exam at the earliest possible time after completing the courses required for the exam. Any exceptions to these time limits must be obtained in writing from the Director of Graduate Studies with approval from the voting faculty. The qualifying exam will be offered two times per year, once at the beginning of the Fall semester (August) and once at the beginning of the Spring semester (January). The exam will consist of two parts, to be given on separate days. Each part will be designed to be completed within a four-hour period. Part I will cover Stat 7750 (Introduction to Probability Theory) and 7760 (Statistical Inference). Part II will cover Stat 8310 (Data Analysis I) and 8320 (Data Analysis II). Students who fail a part of the qualifying exam on the first try must take that part of the exam again the next time the exam is offered if they choose to continue in the PhD program. On the second attempt, students are expected to take only the parts of the exam that they failed on the first attempt. In general, a student may attempt all or part of the exam at most two times. In rare and special situations, a student may appeal to the Director of Graduate Studies for a third attempt and be given the opportunity with approval from the voting faculty.

**Doctoral Committee**

Within one semester of passing the qualifying examination, a student must choose a doctoral program committee in consultation with his or her adviser. This committee consists of at least five members, at least three of whom are members of the doctoral faculty in statistics and at least one from another MU doctoral program.

**Preliminary Examination**

Before taking the preliminary exam, the student is required to have passed the qualifying exams and chosen his/her major professor. Students must take the preliminary exam at the earliest possible time after the student has passed the qualifying exam and completed the courses required for the preliminary exam. Any exceptions to these time limits must be obtained in writing from the Director of Graduate Studies with approval from the voting faculty. The preliminary exam will be offered two times per year, once at the beginning of the Fall semester (August) and once at the beginning of the Spring semester (January). The exam will consist of two parts, to be
given on separate days. Part I will cover Stat 9710 (Mathematical Statistics I) and Stat 9720 (Mathematical Statistics II), and part II will cover Stat 9310 (Theory of Linear Models). Part I will be designed to be completed in four hours and Part II will be designed to be completed in three hours. Students who fail a part of the preliminary exam on the first try must take that part of the exam again the next time the exam is offered if they choose to continue in the PhD program. On the second attempt, students are expected to take only the parts of the exam that they failed on the first attempt. In general, a student may attempt all or part of the exam at most two times. However, if it is the student’s second attempt and the student fails one or both parts of the exam, the voting faculty may, upon consideration of the exam performance and other information deemed relevant, vote that the student be allowed to take the failed portion(s) of the exam a third (and final) time.

**Grading and Evaluating of the Qualifying and Preliminary Examinations**

A “blinded” approach will be used when grading and evaluating the qualifying and preliminary examinations. Specifically, each student taking the exam will be given a unique ID that will be used throughout the entire grading and evaluating process. Each blinded part of the exam will be evaluated individually as pass or fail. The blinded method of evaluation will be strictly adhered to. That is, no conditional passes/fails will be given and no information other than the performance on the exam will be used to determine a pass or fail on each part of the examination.

**Required Course Work**

Before taking the comprehensive examination, students should complete six courses from the following: Statistics 9100, 9250, 9320, 9370, 9210, 9410, 9510, 9530, 9640, 9810 and 9820 taken at MU or at comparable institutions. (Different 9100s can be counted more than once.) Other courses may be substituted at the discretion of the student’s doctoral program committee.

**Comprehensive Examination**

After successfully completing the preliminary exam and the required coursework, the student is eligible to take the comprehensive examination. This examination consists of a written and oral section as specified in the Graduate School catalog. This examination must be completed at least seven months prior to the final defense of the dissertation.

**Dissertation**

A dissertation, prepared under the direction of a dissertation supervisor, is required. The dissertation should be presented in an open seminar as part of the final examination, which is be conducted by the final examination committee. The dissertation should be made available for public review, through the Department of Statistics office, for at least one week before the examination.

**Additional Requirements**

Additional requirements for the PhD in statistics are determined by the student’s program committee and the director of graduate studies.

**PhD Minor**

To receive a designated minor in statistics for a PhD degree, at least 15 credit hours of course work at the 7000 level or higher must be completed from the Department of Statistics at MU. The courses must include Statistics
8310 and 8320, but may not include Statistics 7002, 7020, 7050, 7070, 7085, 7510, 7530, 8085, 8090, or 9085. Students must have taken a calculus based mathematical statistics course at the level of Stat 7710 or 7760 or above, but no more than 6 hours of Stat 7710, 7750, and 7760 can be counted towards the 15 hours. The plan of study must be approved by the Director of Graduate Studies of the Statistics Department and be completed with an average grade of B (3.0) or higher. Each student is encouraged to seek approval of his/her plan of study as soon as possible.

Courses

See Statistics (STAT) in the myZou online system.