EXPERIMENTAL STATISTICS

PROGRAM OVERVIEW

The Department of Experimental Statistics is the principal source of statistical education, research, and service at LSU. This department is unique in its strong orientation toward the application of statistics. Faculty provide expert statistical support for the University community.

Faculty also routinely serve on graduate committees in other departments and collaborate on interdisciplinary research projects, in addition to directing graduate students in statistics and conducting independent research programs. The department has approximately 30 master's students, who interact closely with the faculty.

ADMINISTRATION

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DEGREE PROGRAMS

The Department of Experimental Statistics offers the Master of Applied Statistics (MApStat) degree. Students can opt for a non-thesis (38 credits) or a thesis (37 credits) degree. Students who choose the non-thesis degree are required to complete a special problem that typically involves a novel or extensive use of statistical methods in real applications, usually in the field of the student's minor. Students who choose the thesis degree will write a thesis involving the extension of current statistical methodology or novel/extensive use of statistical methods in a real application. Students gain valuable experience while working closely with faculty and clients during the consulting practicum courses. Each student must present a departmental seminar and must pass the oral and written comprehensive final examination.

Some students in the department pursue dual master's degrees or work toward the MApStat degree while pursuing a PhD in another department. Students completing the MApStat degree are prepared to serve as applied statisticians or to pursue a PhD in statistics or related field. Employment opportunities exist for applied statisticians in business, industry, government, and in educational and research organizations.

Core methods and theory courses (14 credits)
Statistical Methods I (4): EXST 7003, 7004, or 7005
Statistical Methods II (4): EXST 7013, 7014, or 7015
Statistical Theory I (3): EXST 7060
Statistical Theory II (3): EXST 7061

Professional courses (5 credits)
Practicum in Statistical Consulting I (2): EXST 7083
Practicum in Statistical Consulting II (2): EXST 7084
Advanced Seminar in Statistics (1): EXST 7086

In addition, students must select a thesis or non-thesis option with additional requirements given below.

Nonthesis option (19 credits):
Advanced statistical courses (9 credits)

Three advanced EXST courses approved by the student's graduate advisory committee

Minor area of concentration (9 credits)

Three graduate courses approved by the student's graduate advisory committee EXST 7085 - Special problem (1-3 credits)

Thesis option (18 credits):

Advanced statistical courses (12 credits)
Four advanced courses, with at least 9 hours in EXST, approved by the student's graduate advisory committee
EXST 8000 - Thesis research (6 credits)

ADMISSION

Students must satisfy all admission requirements of the Graduate School. Application materials, obtained from the department, must be completed and returned to the Graduate School. Transcripts and three letters of recommendation must also be sent to the Graduate School. Letters should be written by individuals who have knowledge of the student's academic and professional qualifications.

Admission is based on aptitude, interest, and background, as documented in application materials. Evidence of a strong aptitude comes from GRE scores and grades in previous college courses. Breadth of background, particularly in the applied sciences, is advantageous. Previous training in probability and statistics is desirable but not required.

To complete the program successfully, students need a working knowledge of multidimensional calculus and linear (matrix) algebra. Qualified students who have not had adequate training in mathematics can be admitted and allowed to schedule appropriate courses to satisfy this requirement without credit toward the degree.

FINANCIAL ASSISTANCE

Graduate assistantships, awarded competitively with the approval of the department head, pay from $9,500 for nine months to $14,500 per year for a full-time assistantship of 20 hours per week. Academic qualifications and ability to carry out assistantship duties are the major considerations in awarding assistantships.

Some assistantships, particularly those funded by contracts, may require special skills or qualifications. The department normally will provide assistantship support for a maximum of two calendar years.

GRADUATE COURSE OFFERINGS

The department offers a two-semester sequence in statistical methods that is taken by graduate students from departments throughout the University. Specialized courses in mathematical statistics, nonparametric statistics, regression, experimental design, applied least squares, multivariate statistics, categorical data analysis, sampling, reliability and survival analysis, spatial statistics, population statistics, statistical datamining, statistical computing, Bayesian analysis, and statistical genetics are offered.

Additionally, special topics courses of interest to both students and faculty are offered. These courses serve the educational needs of departmental graduate students, as well as fulfilling part of the department's service mission by providing statistical training to the campus as a whole.

FACILITIES

This department, located in the Agricultural Administration Building, is centrally located and convenient to all campus facilities. The department's computer facilities include state-of-the-art laboratories equipped with approximately 100 stations, with access to the department's servers, the campus high-performance computing systems, and the Internet. These labs are used by students taking both undergraduate and graduate statistical methods courses, as well as by students taking advanced statistics courses. Moreover the labs are used for workshops, computationally intensive statistical research, and statistical data analysis for a wide variety of University research projects through which the department, faculty, staff, and students provide statistical support. In addition, the department has a lab of workstations reserved for graduate student statistical computing, and its servers provide for file and printer services, as well as for streaming video services used in statistical instruction, including distance education.

GRADUATE FACULTY

David C. Blouin • Experimental design, mixed models
Luis A. Escobar • Statistical theory, nonlinear methods, survival analysis, engineering reliability, industrial statistics
James P. Geaghan • Biological modeling, quantitative ecology, fisheries statistics
Bin Li • Data mining, statistical learning
Brian D. Marx • Smoothing, signal regression and chemometrics, generalized linear and additive models, ill-conditioned data, penalized likelihood
Kevin S. McCarter • Survival analysis, computationally intensive statistical methods, biostatistics, design and analysis of clinical trials, mathematical statistics, statistical education
Charles J. Monlezun • Linear models, statistical methodology, mathematical statistics
Jing Wang • Computational statistics

FACULTY RESEARCH

Faculty members conduct research in traditional areas of statistics, as well as in applications in diverse areas of agriculture and life, social, environmental, physical, and engineering sciences. Faculty also provide statistical expertise as members of interdisciplinary teams conducting research in such areas as agriculture, forestry, wildlife, fisheries, social sciences, the physical and life sciences, and clinical trials. Faculty publish in applied and theoretical statistics journals and in journals in other fields of application.