MAJOR IN APPLIED MATHEMATICS AND STATISTICS

Guidelines

Every department major for the B.S. or B.A. degree must meet the following departmental requirements. All courses used to meet departmental requirements must be passed with a grade of C- or higher.

1. Calculus I, II, and III: The courses 110.106 or 110.108 can be used to satisfy the Calculus I requirement. The courses 110.107, 110.109, or 110.113 satisfy the Calculus II requirement. The courses 110.202 or 110.211 satisfy the Calculus III requirement. Advanced placement is acceptable as well.
2. Two courses in linear algebra and differential equations. These two courses must, collectively, touch both areas. There are two ways to meet this two-course requirement: (a) 110.201 or 110.212 for linear algebra, and 110.302, 110.417, 550.386, or 550.391 for differential equations; or (b) 550.291 for an introduction to both linear algebra and differential equations, and an additional course in linear algebra or differential equations chosen from among the following: 550.385, 550.386, 550.391, 550.692, and 110.417.
3. A course in computing emphasizing numerical/scientific computing: 500.200, 530.106 (taken prior to Fall 2007), 550.281, 550.385, 550.386, or 570.210 is acceptable. (Other courses may be substituted with advisor's approval.)
4. A course in discrete mathematics: 550.171, 550.371, 550.471, or 550.472 is acceptable.
5. At least five approved 3- or 4-credit Applied Mathematics and Statistics courses numbered 300 or higher, including an optimization course, typically 550.361, and two courses in probability and statistics, chosen from 550.310, 550.311, 550.420, and 550.430. (Either 550.310 or 550.311[but not both] can be used for this purpose.) Any course numbered 300 or higher used to satisfy the requirements 1-4 above may count towards meeting this requirement. More advanced courses may be substituted with advisor's approval. One course in real analysis (110.405 or higher), abstract algebra (110.401), or differential equations (110.302) may be used toward the total of five courses. Students may choose to write a senior thesis, but the thesis (550.501) does *not* count toward the five-course total.
6. Courses coded (Q) totaling 40 credits, of which at least 18 credits must be in courses numbered 300 or higher. (Courses used to meet the requirements above may be counted toward this total.)
7. For the B.S. degree, at least 12 credits coded (N). Laboratory courses that accompany (N) courses may be used in reaching this total. (Courses used to meet the requirements above may be counted toward this total.)
8. A sequence of three approved courses in an area of application (outside the department). At least one of these courses must be quantitatively oriented and be at the 300-level or above. Appropriate fields include, but are not restricted to, biology, biomedical engineering, chemistry, civil engineering, computer science, earth and planetary science, economics, electrical engineering, mechanical engineering, physics, psychology, sociology, and systems analysis for public decision making.

In addition to satisfying departmental requirements, candidates for a B.A. or B.S. degree must satisfy the requirements for the B.A. in the School of Arts and Sciences or the B.S. in the School of Engineering, respectively. Please see the course catalog for the B.A. and B.S. requirements.

For either degree, there is a minimum degree requirement of 120 credits. The codes E, H, N, Q, S and W are merely guides as to whether a course is suitable to help distribution requirements. The student's advisor must approve all course selections.

AREAS OF FOCUS

The department has established the following optional areas of focus.

Probability. Students will take
• 550.420 (550.310/311 may *not* be substituted),
• 550.426 or 550.427, and
• one additional course in probability or statistics at the 400-level (or higher) or real analysis 110.405 (or higher).

Statistics. Students will take
• 550.430 (550.310/311 may *not* be substituted), and
• two of the following courses: 550.413, 550.432 through 550.438.

Optimization. Students will take
• 550.361, and
• two of 550.362, 550.453, and 550.463.

Discrete Mathematics. Students will take
• Either 550.471 or 550.472, and
• one additional course from 550.371, 550.471, 550.472, and 550.463.

Scientific Computing. Students will take
- two of 550.385, 550.386, and 550.433.

CAPSTONE EXPERIENCE

Students may elect to complete a capstone experience. This consists of taking 550.400 Modeling & Consulting in the fall of their senior year followed by a senior thesis (550.501) during the spring. An oral presentation based on the thesis is required.

HONORS

To earn departmental honors, undergraduate majors must earn a GPA of 3.5 or higher in their Applied Mathematics and Statistics courses and do one of the following:
• complete one of the area of focus described above,
• complete a capstone experience as described above, or
• complete the department's combined bachelor's/master's program.