School of Statistics Graduate Program Goals and Outcomes

Program Overview

The School of Statistics graduate program has 20 faculty, 85 M.S. students (60 M.S. primary and 25 receiving a consecutive PhD), and 42 Ph.D. students. The School offers a Plan B option M.S. degree and a research-based Ph.D. degree. Both the M.S. and Ph. D. programs have been updated with emphasis placed on providing first-rate training to students in both programs. However, attention is not limited to graduate students in statistics. The School faculty teach approximately 30 courses at the graduate level and at least half of these courses regularly enroll a substantial number of graduate students from other disciplines.

Process for Learning Goals Project

Graduate program goals and learning outcomes were identified and reviewed by a small group of faculty and staff, representative of the spectrum of the School. This was incorporated into a document which was then shared with a representative group of graduate students. Once all feedback had been incorporated, the document was shared with all School faculty and graduate students to solicit further input.

Educational Goals and Outcomes

Graduates of the Statistics Graduate Program either pursue further education or find jobs in industry, government, or academia. Doctoral graduates typically find employment in academia, research institutes, industry, or government. Masters graduates will either pursue further study or find employment in industry or government. The goal of the Statistics Graduate Program is to provide the training required for graduates to have the opportunity for success in all of these areas. Ideally, all graduates should exhibit the following general outcomes: knowledge and scholarship, effective oral and written communication skills, ethical professional conduct and the ability to work individually and as part of a team.

Specific goals and desired outcomes for doctoral students include:

- Deep understanding and proficiency in statistical theory, methodology, computing and applied statistics at the level required to contribute to the discipline;
- Specialized knowledge of the literature in at least one area of statistics, including the ability to identify new research opportunities;
- The ability to conceptualize and define the statistical aspects of a problem;
● Proficiency in designing and executing a research strategy to answer significant questions;
● The ability to effectively communicate statistical concepts to a wide variety of individuals and groups both orally and in writing. This includes the opportunity for teaching with training and evaluation; and
● Contribute to the intellectual community and be able to critically analyze and evaluate one's own findings and give effective and constructive feedback to others.

Specific goals and desired outcomes for masters students include:

● Proficiency in statistical theory, methodology, computing and applied statistics at the level required to solve substantive statistical problems;
● The ability to conceptualize and define the statistical aspects of a problem;
● The ability to effectively communicate statistical concepts to a wide variety of individuals and groups both orally and in writing.

Achievement and Assessment of Student Goals and Outcomes

Successfully completing the following coursework provides evidence of a doctoral student’s knowledge of advanced quantitative methods and that students achieve the necessary breadth of expertise:

Stat 8051-2-3-4  Applied Statistical Methods I, II, III, IV
Stat 8111-2  Mathematical Statistics I, II
Stat 8801  Statistical Consulting
Electives  A minimum of 12 additional credits in advanced elective courses
Supporting Program  12 credits in a supporting program approved by the DGS and adviser.

Doctoral students demonstrate mastery of the fundamentals by passing two written preliminary exams; one in statistical theory and another in computing and applications. The preliminary oral exam and thesis prospectus demonstrate the doctoral student’s ability to (i) synthesize the existing literature and identify new research opportunities in the field, and (ii) design a research project that creates new knowledge. Successful completion of a PhD level dissertation approved by the student’s final examining committee and passing the final oral exam is evidence of the student’s contribution to knowledge in the discipline.
The development and transformation of doctoral students to scholars and professionals is further supported by:

- Students are strongly encouraged to be active participants in weekly departmental research colloquia;
- In the summer after the first year of coursework doctoral students work directly with faculty on an independent research project;
- Doctoral students take 4 semesters of a seminar devoted to learning the statistical research literature with a focus on developing effective oral and written communication skills;
- In the summer after the second year of coursework, doctoral students complete an on-campus internship where they work in teams to solve real-world applied problems.
- All doctoral students have the opportunity to work as Graduate Instructors or Teaching Assistants. Teaching opportunities include specific training and evaluation;
- Group projects and teamwork with fellow students, both formal and informal;
- Doctoral students are eligible for financial support for travel to national conferences where they are expected to present the results of their research.

Completing the following coursework provides evidence of a masters student’s knowledge of advanced quantitative methods and that students achieve the necessary breadth of statistical expertise:

Statistical Theory Stat 8101-8102
Statistical Methods Stat 8051-8052
Stat 8801 Statistical Consulting
Stat 5701 Statistical Computing
An approved supporting field of at least six credits and at least six credits of electives.

The development and transformation of Masters students into professionals is further supported by:

- Opportunities to be active participants in weekly departmental research colloquia;
- In the summer after the first year of coursework masters students are encouraged to pursue an internship and often work as part of a team with the doctoral students in an on-campus internship;
- Most masters students have the opportunity to work as Graduate Instructors or Teaching Assistants. Teaching opportunities include specific training and evaluation;
- Group projects and teamwork with fellow students, both formal and informal; and
Masters students are eligible for financial support for travel to national conferences where they are expected to present the results of their research.

While masters students do not typically achieve the same depth and breadth of disciplinary knowledge as a doctoral student, they should make a contribution to the field and develop critical thinking and problem solving skills. They gain proficiency in the use of quantitative methods, data management and research design by developing a research proposal, conducting the research and completing a Plan B project. After two semesters of graduate study, each MS student will select a School faculty member to advise them on the Plan B project. Wide latitude is given in the selection of projects.

**Evaluation**

The basic evaluations for good degree progress include the following:

1) Maintaining good academic standing with a GPA of 3.0 or above;
2) Successful completion of required oral and written exams at the appropriate time in the program;
3) Successful defense of a PhD thesis or MS Plan B project as a culmination of the student’s graduate work; and
4) Annual faculty evaluation of all graduate students.

The School of Statistics tracks and assesses student progress through an annual evaluation process. This process reflects the belief that the primary assessment of graduate student learning outcomes occurs between student and adviser, with input from their M.S or Ph.D. committee. For first year students the DGS is the default adviser. As students progress in the program they are expected to select an adviser who will supervise their research. Each graduate student is asked to evaluate their progress and to list any major milestones, including their progress toward completing the required coursework, from the previous year and goals for the next year. The student then shares this document with their adviser, who adds their evaluation. Student and adviser then meet to discuss the evaluation and sign off on the document. Most graduate students report far more frequent meetings with their adviser than this yearly evaluation requires. However, the formal reviews also help identify problems between faculty and students and help the DGS identify students who are not making sufficient progress towards their degree. A letter of progress is sent to each graduate student after the completion of each academic year to indicate good progress or areas of needed improvement.