

Master of Science in Mathematics

The Master of Sciences in Mathematics serves the prospective future college educator, students who may pursue doctoral studies, as well as students who intend to seek professional employment in an interdisciplinary or computationally intensive environment. The program broadens the student's mathematics education beyond that of a BA or BS degree. There is an emphasis on further strengthening abstract and conceptual tools, exposing the student to a wide variety of mathematical topics.

Program Goals

- 1) Be able to frame abstract arguments and produce mathematical proofs.
- 2) Demonstrate an understanding of a variety of advanced topics, such as real analysis, complex analysis, abstract algebra, and topology.
- 3) Demonstrate an ability to articulate the context and meaning of these topics.

Student Learning Outcomes

- 1) Demonstrate advanced computational competence in analysis, algebra, differential equations, statistics and other specialized areas of mathematics.
- 2) Demonstrate understanding of the conceptual frameworks and underlying structure of these topics; clearly demonstrate an ability to construct mathematical proofs.
- 3) Relate these subject areas to applications in the natural or social sciences, engineering, or other areas of mathematics.
- 4) Write, analyze and communicate in a lucid and critical manner, for a wide range of potential mathematics intensive careers, including collegiate level teaching.
- 5) Have a sense of the broader mathematical culture.

Process for Assessing each Student Learning Outcome

1. Timeline for assessment and analysis

See (2) below. Much of our means of assessment is on an ongoing basis through the Departmental Graduate Committee's annual evaluation of our graduate courses.

2. Means of assessment and desired level of student achievement

Outcomes (1-3) will be evaluated within the courses themselves, through examinations, written homework, etc. on an ongoing basis, assessed annually by the Departmental Graduate Committee.

Outcome (1) is generally evaluated through computational problems in the 4000- and higher level courses. The effectiveness of our courses will be reflected in the quality of the work of the students, assessed annually by the Departmental Graduate Committee.

Outcome (2) is evaluated in our graduate level courses, all of which are proof-intensive. The effectiveness of these courses is self-evident to faculty involved in upper level mathematics instruction - Are our students able to function in that setting? - and is to be assessed annually by the Departmental Graduate Committee.

Outcome (3) will be evaluated through application oriented projects and open-ended exercises, in applied courses and as topics within a wide range of other courses. The effectiveness of our courses will be reflected in the quality of the work of the students, assessed annually by the Departmental Graduate Committee.

Outcome (4) will be evaluated throughout the student's graduate career, through written open-ended exercises. The primary evaluation occurs in comprehensive Masters Exams, described below. The effectiveness of our program overall will be reflected in the quality of the exams, assessed annually by the Departmental Graduate Committee.

Outcome (5) will be evaluated through overall levels of participation in a wide range of activities within the department aimed at fostering a sense of the broader mathematical culture: interdisciplinary research projects, career fairs, internships, AWSM, Celebration of Mind, and tutoring.

Terminal Assessment:

We currently use a comprehensive battery of exit examinations in the cornerstone topics of analysis, algebra and topology.

3. Reporting of results

Results will be reported annually to the Dean of Fulbright College.