

Academic Assessment Plan

Master of Arts in Secondary Mathematics

May 31, 2016

The Master of Arts in Mathematics is primarily intended for the secondary or small college educator, broadening the student's mathematics education beyond that of a BA degree. There is an emphasis on further strengthening abstract and conceptual tools, exposing the student to a wide variety of mathematical topics, and preparing the student to bring mathematical thought to the mathematics classroom.

Program Goals

There is an emphasis on further strengthening abstract and conceptual tools, exposing the student to a wide variety of mathematical topics, and preparing the student to bring mathematical thought to the lower-level classroom. To this end the student should:

- 1) Be able to frame abstract arguments and produce mathematical proofs.
- 2) Demonstrate an understanding of a variety of advanced topics, such as advanced calculus and abstract algebra, connecting them to the secondary school curriculum.
- 3) Demonstrate an ability to articulate the context and meaning of these topics.
- 4) Write, analyze and communicate in a lucid and critical manner.

Student Learning Outcomes

- 1) Demonstrate computational competence in analysis, algebra, statistics and other areas of mathematics relevant to the secondary mathematics curriculum.
- 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 at a level appropriate to the secondary mathematics curriculum.
- 4) Write, analyze and communicate in a lucid and critical manner, particularly in a manner appropriate for the secondary mathematics classroom.
- 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 courses for this degree program. 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 courses for this degree program, all of which are proof-intensive and is to be assessed annually by the Departmental Graduate Committee.

Outcome (3) is evaluated in courses for this degree program, all of which are proof-intensive and is to be 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 and a capstone project. The effectiveness of our program overall will be reflected in the quality of the work of these projects and exams, assessed annually by the Departmental Undergraduate 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 as well as a portfolio or final project.

3. Reporting of results

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