

**Academic Year:** 2013-2014

**Program/Department:** M.S. in Mathematics

**College:** Arts and Sciences

**Submission Date:** June 27, 2014

**Contact:** Allan Mills

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### **I. Program/Department Mission:**

The central and fundamental mission of the University is two-fold: to offer a strong academic program to its students and to preserve and enhance knowledge - knowledge contained in its library and in the minds and intellects of its faculty. The Department of Mathematics acts to carry out its share of that mission through course offerings and activities in its disciplines designed to stimulate clear and logical thinking, strengthen the ability to understand and formulate quantitative relationships using mathematics, foster appreciation of the contributions made to our civilization by mathematics, illustrate current and potential uses of mathematics in our technological world, and develop fluency in mathematical skills. It is the mission of the Department:

- (1) To supply knowledge and appreciation of mathematics at a level commensurate with the cultural training expected of all university students;
- (2) To prepare its majors to pursue graduate work in mathematics, to seek employment as mathematicians, or to teach mathematics at a level consistent with their training;
- (3) To support the educational programs of other units of the University at both the undergraduate and graduate level;
- (4) To provide both personal and professional advisement for its majors in the context of the mathematical discipline;
- (5) To serve the University and the larger community by providing, for example, committee representation, off-campus instruction, as needed, and assistance with services designed to support the educational objectives of the local school systems such as science fairs, mathematics contests, science bowl, career day, and similar events;
- (6) To conduct research in pure and applied mathematics and statistics and prepare scholarly papers for publication or oral presentation; and
- (7) To update its curricula regularly to reflect developments in mathematics and changes in the needs of its constituencies.

### **II. Program Goals and Student Learning Outcomes:**

#### **Program Goals:**

1. The M.S. in Mathematics degree program will average at least 5 graduates per year.
2. Mathematics graduate students will participate in extracurricular activities related to mathematics. These activities will include participation in the Graduate Seminar and Teaching Seminar, presenting research, and the opportunity to attend lectures by guest speakers (at least two per year).

#### **Student Learning Outcomes:**

1. All M.S. in Mathematics candidates will demonstrate a command of principles of general mathematics and their particular area of interest.

### **III. Assessments**

### Assessments for Program Goals

- a) **Count the number of M.S. in Mathematics graduates in the previous July 1-June 30 time period.** (Conducted each May)-Program Goal 1.
- b) **Count the number of presentations made by graduate students and the number of presentations by guest speakers.** (Conducted each May) - Program Goal 2.

### Assessments for Student Learning Outcome 1

- a) Oral exam, written thesis, and thesis defense
- b) Written comprehensive exams in two of three areas of emphasis

## IV. Rationale for Outcomes and Assessments

### Program Goal Assessments:

**Count the number of M.S. in Mathematics graduates** (Conducted each May)-Program Goal 1 - The number of students earning the MS in Mathematics in the previous year is determined and trends are tracked using a 5-year average of the number of graduates.

**Count the number of presentations by graduate students and presentations by guest speakers** (Conducted each May)-Program Goal 2 - The number of presentations during the previous year by graduate students (in the Graduate Seminar and Teaching Seminar, at Student Research Day, or at a conference) is counted. A count of the number of presentations by guest speakers is also made.

### Learning Outcome Assessments:

#### Learning Outcome 1:

Each non-thesis student's mathematics knowledge is assessed by two written comprehensive exams.

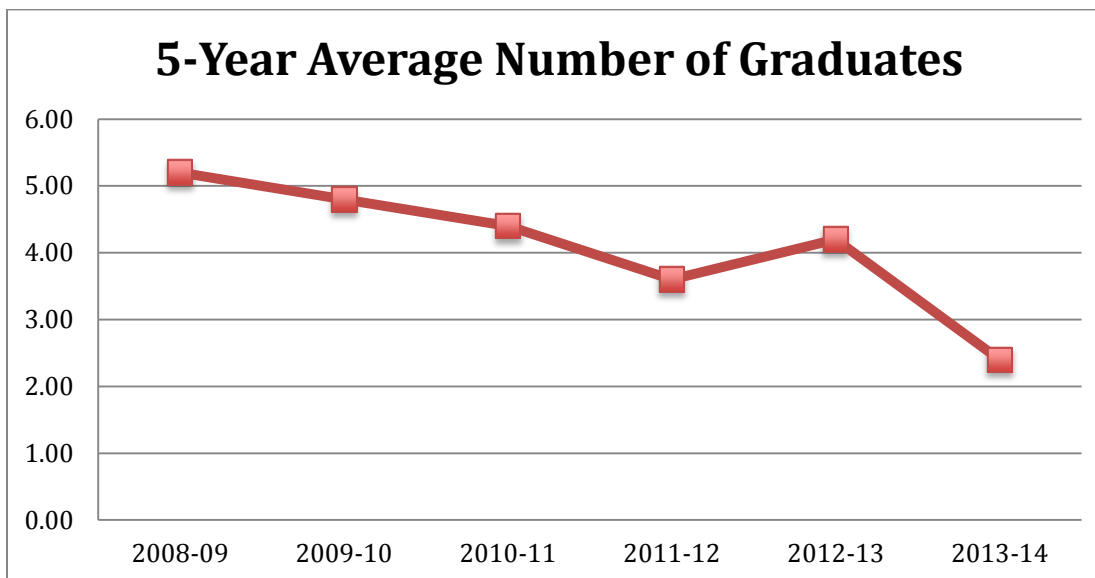
Each thesis student's general mathematics knowledge is assessed by his performance on an oral exam and his understanding of a particular area of interest is assessed by the thesis and the thesis defense.

## V. Results

**Program Goal 1:** The program had only one graduate in the July 1, 2013-June 30, 2014 time period. Two other students who were expected to graduate in May 2014 may complete the thesis in summer 2014 and count toward the number of graduates in 2014-15. The table below displays the number of M.S. in Mathematics graduates per year in recent years.

Year	Total Number of M.S. Graduates
2007-2008	2
2008-2009	10
2009-2010	1
2010-2011	3
2011-2012	2
2012-2013	5
2013-2014	1

The table below shows the trend of the five-year rolling average number of graduates for the MS program.



**Program Goal 2:** Each year the department’s Graduate Advisor arranges a weekly Teaching Seminar and Graduate Seminar (held on Tuesday and Thursday afternoons, respectively) and ensures that each student makes a presentation at least once per academic year. All graduate assistants are expected to attend the Graduate Seminar and the Teaching Seminar each week. The table below shows the number of presentations by graduate students and guests in the Teaching Seminar and the Graduate Seminar. During the 2013-14 academic year the department used some of its budget to pay travel expenses for two visitors. A graduate student presented a paper at the MAA Southeastern Sectional meeting held March 2014.

Academic Year	Teaching Seminar		Graduate Seminar	
	Graduate Student Presentations	Guest Presentations	Graduate Student Presentations	Guest Presentations
2010-2011	9	6	9	0
2011-2012	8	3	8	2
2012-2013	10	2	9	8
2013-2014	10	1	10	5

**Learning Outcome 1:** The student who graduated in 2013-14 demonstrated mastery of general graduate-level mathematics and specific topics related to his particular area of study in his oral exam and thesis defense by answering questions related to his thesis and questions outside his area of emphasis satisfactorily. Each graduate student’s committee uses a rubric (student answered completely, satisfactorily, or unsatisfactorily) to rate the students answers to oral exam and thesis defense questions.

## VI. Modifications and Continuing Improvement: Program Changes due to Assessments

**Program Goal 1:**

In spring 2014 the program was listed on the Tennessee Higher Education Commission's Low Producing List. In order to increase the number of graduates the following actions are planned.

1. Increasing the number of departmental assistantship lines from 8 to 10 effective fall 2014.
2. Increasing the assistantship stipend from \$7,500 to \$9,600 effective fall 2014.
3. Remodeling (in summer 2015) the existing graduate student office space to accommodate more students.
4. Hiring additional professorial rank faculty to support the graduate program by staffing classes and supervising master's thesis. (In fact, an assistant professor with research expertise in numerical analysis was hired in spring 2014 and we plan to search for a statistician in the 2014-15 academic year.)
5. Improving the recruitment and retention of graduate students.
6. Encouraging advanced TTU undergraduate mathematics students to work on research projects and take beginning graduate courses for graduate credit so that they are able to complete the MS program in 1 calendar year.

**Program Goal 2:** No modification needed.

**Learning Outcome 1:** No modifications are warranted. The sole graduate passed his oral exam and thesis defense.