Institutional Effectiveness
2022-2023

Program: Mathematics MS
College and Department: College of Arts & Sciences, Department of Mathematics
Contact: Michael Allen
Mission:

In alignment with Tennessee Tech's Vision and Mission statements, the Department of Mathematics will foster students' tenacity and analytical abilities through the offering of a wide variety of math courses, innovative teaching and research, and service, both public and institutional. As a central part of a STEM-infused comprehensive institution, the Department of Mathematics will create successful learners of mathematics in the university community and in the region. Learning opportunities will be provided to students of all disciplines to advance their understanding of mathematical concepts through effective use of analytical practices and critical thinking. More specifically, the Department will provide its majors with a thorough foundation in mathematics and the flexibility to prepare for a variety of careers through the opportunity to study multiple areas of mathematics.

Attach Curriculum Map (Educational Programs Only):
Here is the current curriculum map for the Masters in Mathematics at Tennessee Tech. As one can see, the map leaves room for the student to pursue their own path but with the stipulation Algebra and Analysis are taken.

MS in MATH Curriculum Map

Student Learning Outcomes	Courses & Degree Requirements			
	MATH 6110 (3 cr hours of Algebra)	MATH 6410, 6310 or 6010 (3 cr hours of Analysis)	Minimum of 30 graduate credit hours in MATH	3 Required Sequences and passing 2 comprehensive exam or 2 Required Sequences & Thesis
Students will demonstrate breadth of mathematical knowledge	X	X	X	X
Students will demonstrate depth of mathematical knowledge			X	X

<div align="center">**PROGRAM GOAL 1: IDEAL NUMBER OF GRADUATE STUDENTS**</div>

Define Outcome:
The Mathematics Masters program will grow and continue to recruit and retain an optimal number of students who major in Math.

Assessment Methods:
The Department will track the number of students applying to, admitted to, and graduating from our Masters program.

Criteria for Success (Thresholds for Assessment Methods):
The Department of Mathematics strives for a at least 15 applicants per year with at least 5 admitted per year and 5 graduated per year.

Results and Analysis:

Semester	Summer 2020	Fall 2020	Spring 2021	Summer 2021	Fall 2021	Spring 2022	Summer 2022	Fall 2022	Spring 2023	Summer 2023
Number of Applicants	5	1	6	0	3	5	0	2	5	1
Numbers of Admits	4	1	6	0	3	4	0	1	5	1
Number of Admits Registered	0	0	3	0	2	4	0	0	4	0
Number of Masters Graduates	1	0	4	0	1	1	0	0	3	0

Use of Results to Improve Outcomes:
It is blatantly obvious this outcome has not been met. Our graduate program needs more students. The Department definitely has its work cut out for this outcome. Maybe it is time to reevaluate our marketing strategy.

PROGRAM GOAL 2: EXTRACURRICULAR ACTIVITIES

Define Outcome:
Mathematics graduate students will participate in extracurricular activities, like workshops, conferences and outreach events, related to mathematics.

Assessment Methods:
The Department will track the number and types of activities attended by our graduate students.

Criteria for Success (Thresholds for Assessment Methods):
The Department would like to see 50% or more of our graduate students participate in outreach, conferences, and other extracurricular activities related to their discipline.

Results and Analysis:
During Spring Semester 2023, all eight Masters students presented in our graduate seminar series. Also, one student presented a poster at Tech's Research and Creative Inquiry Day.

In addition, all students presented lessons and participated in the Graduate Teaching Seminar in the fall and the spring.

Use of Results to Improve Outcomes:
With COVID restrictions fully lifted, the Department is hopeful faculty and students will start attending more conferences and workshops.

STUDENT LEARNING OUTCOME 1: KNOWLEDGE OF GRADUATE-LEVEL ALGEBRA AND ANALYSIS

Define Outcome:
All MS in Mathematics graduates will demonstrate knowledge of graduate-level Algebra and Analysis.

Assessment Methods:
The graduate advisor will track the percentage of students who answer correctly common questions given in their graduate exams.

Criteria for Success (Thresholds for Assessment Methods):
The Department will strive for a better than 75% pass rate on these common questions.

Results and Analysis:
All three graduates of the 2022-23 academic year demonstrated a breadth of knowledge of mathematics by completing Math 6110 - Abstract Algebra and a 6000-level course in Analysis. They also correctly answered the Algebra and Analysis questions posed to them during their oral exams. All three earned A's in both Algebra and Analysis.

Use of Results to Improve Outcomes:
The graduate faculty have discussed a more comprehensive approach to collecting the data on this outcome. It has been proposed a more formal exam should be given than just equating the number of students passing or the number of students answering the oral exam questions.

STUDENT LEARNING OUTCOME 2: DEPTH OF KNOWLEDGE IN AN AREA OF MATHEMATICS

Define Outcome:
All MS in Mathematics graduates will demonstrate a depth of knowledge in an area of mathematics.

Assessment Methods:
The Department will track the pass rate for the oral and comprehensive exams for their Masters students.

Criteria for Success (Thresholds for Assessment Methods):
The Department will strive for a 100% pass rate.

Results and Analysis:
All three 2022-23 graduates completed a thesis and demonstrated a depth of knowledge by defending their theses and having them approved by their advisory committees. A rubric is used by the thesis committees to assess student mastery of thesis topics and the oral exam portion of the thesis defense.

Use of Results to Improve Outcomes:
Because of the amount of detailed work which goes into writing a thesis and the fear of failing an oral exam, this outcome is always met. The Department will design a new learning outcome which will bring a substantive change to the program.

Summative Evaluation:
PO1: It is blatantly obvious this outcome has not been met. Our graduate program needs more students. The Department definitely has its work cut out for this outcome. Maybe it is time to reevaluate our marketing strategy.

PO2: With COVID restrictions fully lifted, the Department is hopeful faculty and students will start attending more conferences and workshops.

Assessment Plan Changes:

SLO1: The graduate faculty have discussed a more comprehensive approach to collecting the data on student knowledge of graduate-level Algebra and Analysis. It has been proposed a more formal exam should be given than just equating the number of students passing or the number of students answering the oral exam questions.

SLO2: Because of the amount of detailed work which goes into writing a thesis and the fear of failing an oral exam, this outcome is always met. The Department will design a new learning outcome which will bring a substantive change to the program.