



Program: Mathematics

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Mission Statement:

The mission of the mathematics program is to provide students with a mathematical education which prepares them to understand, communicate, and apply mathematics. As a result, our graduates will be able to continue their mathematical education in graduate school, become effective secondary school mathematics teachers, or apply their mathematical knowledge and thinking ability in service or industry.

Program Goals:

Goal 1: Students will understand a spectrum of mathematical concepts.

Goal 2: Students will effectively communicate mathematics.

Goal 3: Students will demonstrate an ability to apply mathematical thinking to solve problems.

Program Intended Learning Outcomes (PILO)	Means of Program Assessment & Criteria for Success	Summary of Data Collected	Use of Results
<p>1a: Students will demonstrate a knowledge base of mathematics consistent with the Mathematical Association of America (MAA) standards.</p>	<p>ETS Major Field Test in Mathematics: All senior mathematics majors take this standardized test in the fall semester of their senior year. 80% of scores at or above 139.7 (one standard deviation from the mean) will demonstrate a knowledge base.</p> <p>Ohio Assessment for Educators Test in Mathematics: All majors seeking education licensure take this test for teaching licensure qualification. The test is 150 multiple-choice questions designed to test the ability to understand and work with five main categories: 1. Mathematical Processes and Number Sense, 2. Patterns, Algebra, and Functions, 3. Measurement and Geometry, 4. Trigonometry and Calculus, and 5. Statistics, Probability, and Discrete Mathematics. The State of Ohio requires a minimum score of 220 to receive licensure. This is assessment was only in its second year, having recently replaced the Praxis II. Our initial goal is 100% of students achieving the passing rate as our benchmark to demonstrate a knowledge base.</p>	<p>ETS Major Field Test in Mathematics: Two students took the ETS MFT; the scores were 159 and 159.</p> <p>Subject score reports require at least five students, so the following means are for the past three years (national means in parentheses): Calculus: 29 (31.4) Algebra: 38 (34.1) Routine: 32 (33.8) Non-routine: 37 (26.8) Applied: 36 (35.7)</p> <p>OAE Test in Mathematics: No students took the OAE Test in Mathematics this year</p>	<p>ETS Major Field Test in Mathematics: Both students (100%) scored in the target range (in fact both scored above the national mean).</p> <p>Additionally, all subject scores are at or above one standard deviation from the national mean.</p> <p>This affirms the effectiveness of our curriculum in giving students a sufficient knowledge base in the field.</p> <p>OAE Test in Mathematics: No data</p>
<p>1b: Students will be proficient in mathematics needed to be effective secondary school teachers.</p>	<p>OAE Test in Mathematics: 100% of students achieving a passing score of 220 for the state of Ohio will indicate proficiency.</p>	<p>OAE Test in Mathematics: No students took that OAE Test in Mathematics this year</p>	<p>OAE Test in Mathematics: No data</p>

	<p>ETS Major Field Test in Mathematics: The mean of our students falling within one standard deviation of the mean of 31.4 on the Calculus subsection will indicate proficiency. Thus, a mean of 23.7 will indicate proficiency.</p>	<p>ETS Major Field Test in Mathematics: The calculus subscore mean was 29.</p>	<p>ETS Major Field Test in Mathematics: Our mean is above 23.7, and near the national average of 30.7, continuing to affirm changes made to re-emphasize calculus later in the curriculum.</p>
<p>2a: Students will demonstrate ability to independently study and verbally communicate mathematics.</p>	<p>Presentation rubric: A rubric to assess mathematical presentations. Presentations in MATH 343 and 460 are assessed by all professors in the program.</p> <p>Each category on the rubric is scored out of 5 points, and then weighted. Success will be demonstrated if 70% of students get 4 or 5 points (5 point scale) in 7 out of the 10 categories.</p>	<p>MATH 343: No data – this course was canceled due to lack of enrollment</p> <p>MATH 460: Two of the three students met the benchmark (the number of categories with scores of 4 or 5 were 5, 7 & 11).</p>	<p>MATH 343: No data</p> <p>MATH 460: Due to the small number of students, we are not concerned with the 67% success rate as compared to the 70% goal. We will continue to develop students presentation skills, but are cautious about putting too much emphasis on results with such small sample sizes.</p>
<p>2b: Students will demonstrate ability to independently study and communicate mathematics in writing.</p>	<p>Paper writing rubric: A rubric to assess mathematical papers. Student papers from MATH 343, 352, and Math 460 are assessed by all professors in the program.</p> <p>As in the Presentation Rubric, success will be determined if 70% of students score a 4 or 5 in 8 out of 12 categories for papers written in MATH 460 (Senior level). For papers written for MATH 343 and 352, success will be demonstrated by 70% of students scoring a 4 or 5 in 6 out of 12 categories. Additionally, the department will track individual scores across the courses and expect improvement.</p>	<p>MATH 343: No data – this course was canceled due to lack of enrollment</p> <p>MATH 352: No data – this is an alternate year course.</p> <p>MATH 460: Both students met the benchmark (scoring 4 or 5 in ten categories for one student, and all twelve for the other).</p>	<p>MATH 343: No data.</p> <p>MATH 352: No data.</p> <p>MATH 460: While the small sample size requires caution in making conclusions, the results are encouraging with regards to the overall success of our program in meeting its objectives.</p>
<p>3a: Students will write proofs effectively.</p>	<p>Proof writing rubric: A rubric to assess mathematical proofs. Selected proofs from MATH</p>	<p>MATH 341: No data – this is an alternate year course</p>	<p>MATH 341: No data.</p>

	<p>341, 352 and 432 are assessed by all professors in the program. Success will be demonstrated if 80% of students score 18 or higher out of 25 points on the rubric. Additionally, the department will track individual scores across the courses and expect improvement.</p>	<p>MATH 352: Data for this course was unfortunately lost as a result of office relocations.</p> <p>MATH 432: Data for this course was unfortunately lost as a result of office relocations.</p>	<p>MATH 352: No data, although no significant concerns were remembered for this course.</p> <p>MATH 432: No data, although memory suggests that the student outcomes were encouraging for this course.</p>
<p>3b: Students will solve a variety of problems.</p>	<p>ETS Major Field Test in Mathematics: The mean of our students on the “routine” section will be above 26.3 and on the “non-routine” section will be above 21.4 (above one standard deviation from each mean).</p> <p>OAE Test in Mathematics: The State of Ohio requires a minimum score of 220 to receive licensure. 100% of students scoring at or above the minimum score of 220 will demonstrate ability to solve a variety of problems.</p>	<p>ETS Major Field Test in Mathematics: The “routine” subscore mean was 32, and the “non-routine” subscore mean was 37.</p> <p>OAE Test in Mathematics: No students took the OAE Test in Mathematics this year</p>	<p>ETS Major Field Test in Mathematics: Both scores fall comfortably in the acceptable range, with the “non-routine” score being especially noteworthy (96th percentile)</p> <p>OAE Test in Mathematics: No data</p>