MATHEMATICS EDUCATION
M.S.

Degree: Master of Science
https://www.towson.edu/fcsm/departments/mathematics/grad/education/

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The Master of Science in Mathematics Education program at Towson University provides mathematics teachers with advanced study in mathematics, mathematics education and general education. The program offers teachers additional experience in higher-level mathematics to enhance their teaching with additional depth and breadth of content. At the same time, it strengthens their backgrounds in the school mathematics curriculum, instructional practices, assessment and technology. It also provides them a relevant way of satisfying their in-service requirements for professional advancement.

The program offers two tracks: Secondary School and Middle School. Both tracks require students to take four courses in Mathematics Education (with a focus on pedagogy, integration of technology, and the context of school mathematics), three general education electives, and five mathematics content courses. The two tracks differ primarily in the content focus and level of the mathematics courses. The program was designed with on-the-job teachers in mind, with part-time studies in the evenings and summers available; however, full-time students are also welcome.

Secondary School Track
The Secondary School Track is aimed at current secondary mathematics teachers. Students in this track take mathematics courses to extend their knowledge beyond a bachelor’s degree in secondary mathematics, giving them access to powerful mathematics ideas to take into the classroom.

It is expected that graduates of this program will become leaders in mathematics education as master teachers, curriculum developers, mathematics supervisors and other positions that improve the teaching of mathematics in secondary schools. The special strength of this program is the opportunity to study higher mathematics content without leaving the field of school mathematics.

Middle School Track
The Middle School Track is designed to target current and future middle school mathematics teachers who are elementary or middle school certified. Students in this program will broaden and deepen their mathematical content knowledge through courses that target the conceptual ideas of middle school mathematics and beyond.

It is expected that graduates of this program will become leaders in mathematics education in positions that improve the teaching of mathematics in middle schools. The particular benefit of this track is the opportunity to learn mathematics concepts and skills that are meaningful and applicable for classroom teachers in grades 3-8. Professors will model best practices in instructional techniques to enhance students’ learning of both mathematics and pedagogical skills.

Admission Requirements
Applicants must meet the general requirements for graduate study outlined in this catalog. The applicant must possess current certification for teaching secondary school mathematics (Secondary School Track) or teaching elementary school (Middle School Track). In some circumstances, as determined by the program director, two years of recent, documented, full-time teaching experience may replace the certification requirement. For the Secondary School Track, the applicant should have an undergraduate degree (or MAT) in mathematics with a secondary education concentration or the equivalent, from a regionally accredited college or university**, with a minimum undergraduate GPA of 3.00 for full admission and 2.75 for conditional admission. For the Middle School Track, the applicant should have an undergraduate degree in elementary education or the equivalent from a regionally accredited college or university**, with a minimum undergraduate GPA of 3.00 for full admission and 2.75 for conditional admission. All GPA calculations for admission are based upon the last 60 units of undergraduate and post-baccalaureate study.

Non-immigrant International Students
Program Enrollment: F-1 and J-1 students are required to be enrolled full-time. The majority of their classes must be in-person and on campus. See the list of programs that satisfy these requirements, and contact the International Student and Scholars Office with questions.

Admission Procedures: See additional information regarding Graduate Admission policies and International Graduate Application online.

**See Exceptions to Policy in Graduate Admissions.

Degree Requirements
The student is required to successfully complete a total of at least 36 units of course work (with no more than 9 units below the 600 level), as outlined below.

Secondary School Track

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 602</td>
<td>MATHEMATICS IN SOCIETY: PAST AND PRESENT</td>
<td>3</td>
</tr>
<tr>
<td>MATH 626</td>
<td>MAKERSPACE TECHNOLOGY IN SCHOOL MATHEMATICS</td>
<td>3</td>
</tr>
<tr>
<td>MATH 627</td>
<td>CURRICULUM ISSUES IN SECONDARY SCHOOL MATHEMATICS</td>
<td>3</td>
</tr>
</tbody>
</table>

Section B: Courses in General Education and Pedagogy
Students complete a total of three education-related courses. The following are examples of such courses:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Units</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 622</td>
<td>SEMINAR IN TEACHING ADVANCED PLACEMENT CALCULUS</td>
<td>9</td>
</tr>
<tr>
<td>EDUC 601</td>
<td>CONCEPTS AND ISSUES IN EDUCATION</td>
<td></td>
</tr>
<tr>
<td>EDUC 605</td>
<td>INFORMING EDUCATIONAL PRACTICE TO EFFECT CHANGE</td>
<td></td>
</tr>
<tr>
<td>EDUC 614</td>
<td>ASSESSMENT AND EVALUATION IN EDUCATION</td>
<td></td>
</tr>
</tbody>
</table>
Section C: Mathematics Foundation

Students complete five courses, one course from each of category and one additional course from any category: 15

Algebra

- MATH 563  LINEAR ALGEBRA
- MATH 565  NUMBER THEORY
- MATH 568  ALGEBRAIC STRUCTURES
- MATH 667  ALGEBRA OF SYMMETRIES

Analysis

- MATH 535  NUMERICAL ANALYSIS I
- MATH 576  INTRODUCTORY REAL ANALYSIS
  or MATH 628  REAL ANALYSIS FOR TEACHERS
- MATH 577  COMPLEX ANALYSIS
- MATH 578  TOPOLOGY
- MATH 579  FOURIER ANALYSIS WITH APPLICATIONS

Geometry

- MATH 557  DIFFERENTIAL GEOMETRY
- MATH 653  TOPICS IN GEOMETRY
- MATH 671  CHAOTIC DYNAMICS AND FRACTAL GEOMETRY

Statistics/Probability

- MATH 531  PROBABILITY
- MATH 532  MATHEMATICAL STATISTICS
- MATH 630  STATISTICS-AN INTEGRATED APPROACH
- MATH 651  MATHEMATICS OF FUZZY LOGIC

Section D: Mathematics Methods

MATH 625  ADVANCED PEDAGOGY FOR SECONDARY MATHEMATICS  3

Total Units  36

Middle School Track

<table>
<thead>
<tr>
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<th>Units</th>
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</thead>
<tbody>
<tr>
<td>MATH 563</td>
<td>LINEAR ALGEBRA</td>
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<td>NUMBER THEORY</td>
<td>3</td>
</tr>
<tr>
<td>MATH 568</td>
<td>ALGEBRAIC STRUCTURES</td>
<td>3</td>
</tr>
<tr>
<td>MATH 667</td>
<td>ALGEBRA OF SYMMETRIES</td>
<td>3</td>
</tr>
</tbody>
</table>

Section C: Mathematics Foundation

Students complete three courses, one from each category: 9

Analysis

- MATH 535  NUMERICAL ANALYSIS I
- MATH 576  INTRODUCTORY REAL ANALYSIS
  or MATH 628  REAL ANALYSIS FOR TEACHERS
- MATH 577  COMPLEX ANALYSIS
- MATH 578  TOPOLOGY
- MATH 579  FOURIER ANALYSIS WITH APPLICATIONS
- MATH 667  ALGEBRA OF SYMMETRIES

Geometry

- MATH 557  DIFFERENTIAL GEOMETRY
- MATH 653  TOPICS IN GEOMETRY
- MATH 671  CHAOTIC DYNAMICS AND FRACTAL GEOMETRY

Statistics/Probability

- MATH 531  PROBABILITY
- MATH 532  MATHEMATICAL STATISTICS
- MATH 630  STATISTICS-AN INTEGRATED APPROACH
- MATH 651  MATHEMATICS OF FUZZY LOGIC

Section D: Mathematics Methods

MATH 605  MIDDLE SCHOOL MATHEMATICAL METHODS AND PROBLEM SOLVING  3

Total Units  36

a. Students exiting the graduate program should have an adequate knowledge of mathematical content in Algebra.

b. Students exiting the graduate program should have an adequate knowledge of mathematical content in Geometry.

c. Students exiting the graduate program should have an adequate knowledge of mathematical content in Calculus and Analysis.

d. Students exiting the graduate program should have an adequate knowledge of mathematical content in Probability and Statistics.

Students should be able to plan a lesson using these principals and standards.
f. Students exiting the graduate program should possess a broad knowledge of recent teaching methodologies and pedagogical issues in mathematics education and be able to communicate them in oral and written form.

g. Students should become familiar with appropriate instructional technology in mathematics and mathematics education and be able to use it properly in their own classrooms or in their research of mathematics education.