MATHEMATICS EDUCATION M.S.

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

Program Director: Dr. Sandy Spitzer
Phone: 410-704-2062
Email: sspitzer@towson.edu

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: See additional admission information in Graduate Admissions (https://www.towson.edu/academics/graduate/admissions/apply/international.html)

**See Exceptions to Policy in Graduate Admissions (https://www.towson.edu/academics/graduate/admissions/apply/policies.html)

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>CULTURAL AND PHILOSOPHICAL BACKGROUND OF MATHEMATICS</td>
<td>3</td>
</tr>
<tr>
<td>MATH 626</td>
<td>TECHNOLOGY IN SCHOOL MATHEMATICS TEACHING AND LEARNING</td>
<td>3</td>
</tr>
<tr>
<td>MATH 627</td>
<td>CURRICULUM ISSUES IN SECONDARY SCHOOL MATHEMATICS</td>
<td>3</td>
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</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>
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<tr>
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<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 AFFECT CHANGE</td>
<td></td>
</tr>
<tr>
<td>EDUC 614</td>
<td>ASSESSMENT AND EVALUATION IN EDUCATION</td>
<td></td>
</tr>
<tr>
<td>EDUC 660</td>
<td>MATTERS OF DIVERSITY, EQUITY, AND EMPowerMENT IN LEARNING COMMUNITIES</td>
<td></td>
</tr>
<tr>
<td>SCED 625</td>
<td>TEACHING IN THE MIDDLE SCHOOL</td>
<td></td>
</tr>
<tr>
<td>SCED 635</td>
<td>DISCIPLINE AND CLASSROOM MANAGEMENT IN SECONDARY SCHOOLS</td>
<td></td>
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<tr>
<td>SCED 647</td>
<td>ADVANCED PROCESSES OF TEACHING AND LEARNING</td>
<td></td>
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</tbody>
</table>

Section C: Mathematics Foundation
Students complete five courses, one course from each of category and one additional course from any category:

**Algebra**
- MATH 563 LINEAR ALGEBRA
- MATH 565 THEORY OF NUMBERS
- 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 650 PATTERNS IN MATHEMATICAL DESIGNS
- 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 SEMINAR IN MATHEMATICS EDUCATION FOR SECONDARY SCHOOL TEACHERS 3

**Total Units** 36

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**Middle School Track**

**Section A: Core Required Courses in Mathematics Education, School Mathematics and Pedagogy**

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**Section B: Courses in General Education and Pedagogy**

Students complete a total of three education-related courses. The following are examples of such courses.

- MATH 622 SEMINAR IN TEACHING ADVANCED PLACEMENT CALCULUS
- EDUC 601 CONCEPTS AND ISSUES IN EDUCATION
- EDUC 605 INFORMING EDUCATIONAL PRACTICE TO AFFECT CHANGE
- EDUC 614 ASSESSMENT AND EVALUATION IN EDUCATION
- EDUC 660 MATTERS OF DIVERSITY, EQUITY, AND EMPOWERMENT IN LEARNING COMMUNITIES
- SCED 625 TEACHING IN THE MIDDLE SCHOOL
- SCED 635 DISCIPLINE AND CLASSROOM MANAGEMENT IN SECONDARY SCHOOLS

**Section C: Mathematics Foundation**

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<td>MTED 611</td>
<td>ALGEBRA FOR MIDDLE SCHOOL TEACHERS</td>
<td>3</td>
</tr>
<tr>
<td>MTED 613</td>
<td>MATHEMATICAL MODELING FOR MIDDLE SCHOOL TEACHERS</td>
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</table>

**Section D: Mathematics Methods**

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</thead>
<tbody>
<tr>
<td>MTED 605</td>
<td>MIDDLE SCHOOL MATHEMATICAL METHODS AND PROBLEM SOLVING</td>
<td>3</td>
</tr>
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</table>

**Total Units** 36

1. Students exiting the graduate program should have an adequate knowledge of mathematics contents in Algebra.
2. Students exiting the graduate program should have an adequate knowledge of mathematics contents in Geometry.
3. Students exiting the graduate program should have an adequate knowledge of mathematics contents in Calculus and Analysis.
4. Students exiting the graduate program should have an adequate knowledge of mathematics contents in Probability and Statistics.
5. Students exiting the graduate program should have an adequate knowledge of mathematics education principles and standards and be able to communicate those principles in oral and written form. Student should be able to plan a lesson using these principals and standards.
6. 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.
7. Students should become familiar with the appropriate instructional technology in mathematics and mathematics education and be able to use it properly in their own classrooms or in their researches of mathematics teaching.