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.

Requirements

Admission Requirements

Application deadlines and a full listing of materials required for admission for the Middle School track and Secondary School track can be found on the website.

Degree Requirements

The student is required to successfully complete a total of at least 30 units of course work (with no more than 9 units below the 600 level), as outlined below.

Secondary School Track

Code	Title	Units
Section A: Core Required Courses in Mathematics Education, School Mathematics and Pedagogy		
MATH 602	MATHEMATICS IN SOCIETY: PAST AND PRESENT	3
MATH 626	MAKERSPACE TECHNOLOGY IN SCHOOL MATHEMATICS	3
Section B: Courses in General Education and Pedagogy		
Students complete a total of two education-related courses. The following are examples of such courses:		6
MATH 622	SEMINAR IN TEACHING ADVANCED PLACEMENT CALCULUS	
EDUC 601	CONCEPTS AND ISSUES IN EDUCATION	
EDUC 605	INFORMING EDUCATIONAL PRACTICE TO EFFECT CHANGE	
EDUC 660	MATTERS OF DIVERSITY, EQUITY, AND EMPOWERMENT IN LEARNING COMMUNITIES	
SCED 647	ADVANCED PROCESSES OF TEACHING AND LEARNING	
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	
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 THEORY AND APPLICATIONS FOR TEACHERS	
Section D: Mathematics Methods		
MATH 625	ADVANCED PEDAGOGY FOR SECONDARY MATHEMATICS	3
Total Units		**30**

Middle School Track

Code	Title	Units
Section A: Core Required Courses in Mathematics Education, School Mathematics and Pedagogy		
MATH 602	MATHEMATICS IN SOCIETY: PAST AND PRESENT	3
MATH 626	MAKERSPACE TECHNOLOGY IN SCHOOL MATHEMATICS	3
Section B: Courses in General Education and Pedagogy		
Students complete a total of two education-related courses. The folllowing are examples of such courses.		6
MATH 622	SEMINAR IN TEACHING ADVANCED PLACEMENT CALCULUS	
EDUC 601	CONCEPTS AND ISSUES IN EDUCATION	
EDUC 605	INFORMING EDUCATIONAL PRACTICE TO EFFECT CHANGE	
EDUC 660	MATTERS OF DIVERSITY, EQUITY, AND EMPOWERMENT IN LEARNING COMMUNITIES	
SCED 647	ADVANCED PROCESSES OF TEACHING AND LEARNING	
Section C: Mathematics Foundation		
MTED 611	ALGEBRA IN THE SCHOOL CURRICULUM	3
MTED 613	MATHEMATICAL MODELING IN THE SCHOOL CLASSROOM	3
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	
MTED 614	CALCULUS THROUGH TECHNOLOGY FOR MIDDLE SCHOOL TEACHERS	
Geometry		
MATH 557	DIFFERENTIAL GEOMETRY	
MATH 653	TOPICS IN GEOMETRY	
MATH 671	CHAOTIC DYNAMICS AND FRACTAL GEOMETRY	
MTED 615	GEOMETRY FOR MIDDLE SCHOOL TEACHERS	
Statistics/Probability		
MATH 531	PROBABILITY	
MATH 532	MATHEMATICAL STATISTICS	
MATH 630	STATISTICS THEORY AND APPLICATIONS FOR TEACHERS	
MTED 612	DATA ANALYSIS FOR MIDDLE SCHOOL TEACHERS	
Section D: Mathematics Methods		
MTED 605	MIDDLE SCHOOL MATHEMATICAL METHODS AND PROBLEM SOLVING	3
Total Units		**30**

Learning Outcomes

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.
e. 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. 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.