Master of Science in Mathematics

The M.S. program in Mathematics is designed to provide the mathematical background needed to pursue careers in applied mathematics, statistics, industry, and teaching. Students in the program have the option to concentrate in Applied Mathematics or Secondary Education. Applicants for the program must choose their concentration area when they submit their application for admission to the College of Graduate Studies and Research.

Each concentration includes the completion of 30 credit hours of approved coursework for the degree program and passing the M.S. Qualifying Examination.

M.S. Mathematics: Secondary Education Concentration.
Overview

The Master of Science in Mathematics (Secondary Education Concentration) prepares students to successfully teach mathematics at High School level. It is designed for teachers who wish to improve their level of competence in mathematics or wish to serve as High School Mathematics Specialists, or wish to teach mathematics at the High School level.

The program is for people who (1) are currently teaching mathematics in the High schools, or (2) plan to teach mathematics in the High schools, or (3) wish to switch careers and would like to obtain the M.S Degree in mathematics and also earn credits toward fulfilling the requirements for a High School Teaching Licensure.

M.S. MATHEMATICS: APPLIED MATHEMATICS CONCENTRATION.

OVERVIEW

The Master of Science in Mathematics (Applied Mathematics Concentration) is designed for those with a strong undergraduate background in mathematics who wish to better prepare themselves for careers that include statistics, applied mathematics, or who intend to pursue a Ph.D. degree at another institute. The program is designed so that the student can concentrate in an area of Applied Mathematics, Statistics, or Operation Research.

ADMISSIONS REQUIREMENTS

Admission to the M.S in Mathematics (Secondary Education Concentration)

1. Applicants must fulfill the requirements for admission to the College of Graduate Studies and Research. (i.e., have a B.A. / B.S. degree).
2. Applicants must have successfully completed 18 or more credit hours of College level Mathematics content courses that include Multivariable Calculus, Linear Algebra, and Discrete mathematics. Equivalent courses completed in other subject areas such as physics, engineering, business, computer sciences etc. may apply.

GRE: Not required

Admission to the M.S in Mathematics (Applied Mathematics Concentration)

1. Applicants must fulfill the requirements for admission to the College of Graduate Studies and Research. (i.e., have a B.A. / B.S. degree).
2. Applicants must have successfully completed at least six courses (i.e., 18 or more credit hours of College level Mathematics content courses) above Multivariable Calculus preferably including two of the following or their equivalent: Ordinary Differential Equations, Introduction to Numerical Analysis, Probability and Statistics, and Advanced Calculus.
3. Applicants are expected to be familiar with at least one mathematical or statistical computer package such as R, Maple, Minitab, Matlab, Mathematica, SPSS, SAS, etc.

GRE: Not required

M.S. Mathematics: Secondary Education Concentration.

Program of Study
The program consists of 10 courses (30 credit hours) to be chosen in consultation with the advisor. At least seven of the courses must be at the 400 level. With the approval of the Department of Mathematics, the program accepts transfer credits in accordance with university-wide graduate policy. The National Council of Teachers of Mathematics (NCTM) and the Mathematical Association of America (MAA) recommend that teachers of secondary school mathematics be knowledgeable in the contents of Probability and Statistics, Geometry, History of Mathematics and Foundations of Algebra.

Graduate Program Policies
The policies for the College of Graduate Studies and Research are found here (http://catalog.neiu.edu/graduate-studies-research/graduate-policies/).

Code	Title	Hours
Core Courses		
Five courses from the following list		15
MATH-430	Discrete Mathematical Structures	
MATH-421	Modern Geometry	
MATH-444	Problem Solving, Modeling, And Project In Mathematics With Technology	
SCED-403M	New Directions In Teaching Mathematics In Secondary Schools	
MATH-474	Mathematical Modeling	
MATH-495	Project In Mathematics	
Electives - choose one of two options		15
Option 1 - (five courses from the following list)		
MATH-472	Simulation Modeling And Analysis	
MATH-466	Galois Theory: Historical And Modern	
MATH-305	Probability And Statistics	
MATH-312	Foundations Of Geometry	
MATH-331	Abstract Algebra I	
MATH-321	History Of Mathematics	
MATH-322	Number Theory	
MATH-328	Complex Variables	
MATH-332	Abstract Algebra II	
MATH-337	Theory Of Equations	
MATH-338	Introduction To Real Analysis	
MATH-343	Linear Algebra II	
SCED-409	Teaching Mathematical Problem Solving In The Secondary Schools	
SCED-410	Computers In The Teaching Of Secondary School Mathematics	
SCED-408	The Nature Of Mathematical Abilities In School Children	
Option 2 - Up to 6 credit hours of courses from the following list and up to 9 credit hours of 400 level courses taken for teacher licensure		
MATH-472	Simulation Modeling And Analysis	
MATH-466	Galois Theory: Historical And Modern	
MATH-305	Probability And Statistics	
MATH-312	Foundations Of Geometry	
MATH-331	Abstract Algebra I	
MATH-321	History Of Mathematics	
MATH-322	Number Theory	
MATH-328	Complex Variables	
MATH-332	Abstract Algebra II	
MATH-337	Theory Of Equations	
MATH-338	Introduction To Real Analysis	
MATH-343	Linear Algebra II	
MATH-444	Problem Solving, Modeling, And Project In Mathematics With Technology	
SCED-409	Teaching Mathematical Problem Solving In The Secondary Schools	
SCED-410	Computers In The Teaching Of Secondary School Mathematics	
SCED-408	The Nature Of Mathematical Abilities In School Children	
Total Hours		**30**

Culminating/Capstone Experience Assessment

Students fulfill their culminating experience requirement for the program through demonstration of their abilities in solving problems (i.e., passing the Qualifying examination) and completing a project.

Students must complete:

1. Qualifying Examination for the M.S in Mathematics

Pass a written comprehensive examination that covers topics in the areas of Linear Algebra, Probability and Statistics, Elementary Analysis, and Mathematics Structures.

2. Project for the M.S in Mathematics (Secondary Education Concentration)

Complete a written project under the supervision of a faculty member while enrolled in Mathematics 495 [Project in Mathematics], or complete a 400 level Mathematics course with a project component, approved by the advisor. The students who enroll in Mathematics 495 must present an oral report to a committee consisting of at least three faculty members.

M.S. Mathematics: Applied Mathematics Concentration.

Program of Study
The program consists of 10 courses (30 credit hours) to be chosen in consultation with the advisor. At least seven of the courses must be at the 400 level. With the approval of the Department of Mathematics, the program accepts transfer credits in accordance with university-wide graduate policy.

Graduate Program Policies
The policies for the College of Graduate Studies and Research are found here (http://catalog.neiu.edu/graduate-studies-research/graduate-policies/).

Code	Title	Hours
Core Courses (choose one of two options):		
Project Option		6
MATH-430	Discrete Mathematical Structures	
MATH-495	Project In Mathematics	
Thesis Option		9
MATH-430	Discrete Mathematical Structures	
MATH 590 - Thesis		
Electives - (21 cr if doing a thesis)		24
MATH-406	Linear Programming: Theory And Practice	
MATH-421	Modern Geometry	
MATH-441	Multivariate Statistical Analysis	
MATH-442	Applied Regression Analysis	
MATH-443	Experimental Design	
MATH-466	Galois Theory: Historical And Modern	
MATH-471	Introduction To Stochastic Models	
MATH-472	Simulation Modeling And Analysis	
MATH-473D	Advanced Topics In Operations Research: Decision Theory	
MATH-474	Mathematical Modeling	
MATH-475	Advanced Topics In Operations Research: Mathematical Programming	
MATH-302	Ordinary Differential Equations II	
MATH-303	Partial Differential Equations	
MATH-309	Numerical Analysis II	
MATH-328	Complex Variables	
MATH-334	Mathematical Statistics I	
MATH-336	Statistical Inference	
MATH-338	Introduction To Real Analysis	
MATH-343	Linear Algebra II	
MATH-365	Statistical Computer And Data Analysis Packages	
Total hours		30

Culminating/Capstone Experience Assessment
Students fulfill their culminating experience requirement for the program through demonstration of their abilities in solving problems (i.e., passing the Qualifying examination) and completing a project or thesis.

1. Qualifying Examination for the M.S in Mathematics
All students must pass a written comprehensive examination that covers topics in the areas of Linear Algebra, Probability and Statistics, Elementary Analysis, and Mathematics Structures. If a student has passed the first three actuary exams for the SOA or CAS, then they must show proof to the advisor and will be exempted from the Qualifying examination.

2. Project/Thesis for the M.S in Mathematics (Applied Mathematics Concentration)
Complete a written project or thesis under the supervision of a faculty member while enrolled in Mathematics 495 [Project in Mathematics] or MATH 590 [Thesis].The student must present an oral report to a committee consisting of at least three faculty members.

In order to register for the project course MATH 495 or the thesis course MATH 590, students must submit a signed topic approval form with an abstract of the proposed research project. Students may register for 1-4 credits per term with 6 credits required for the thesis and 3 credits required for the project. All MATH 590 credits must be earned within the equivalent of 2 academic years.