

# MS in Mathematics

## Admission Requirements

Transcripts of all undergraduate and any graduate work must be submitted. In addition to the Graduate College minimum requirements, applicants must meet the following program requirements:

- **Baccalaureate Field** Mathematics or a related field. Applicants must have 20 semester hours of undergraduate work in mathematics beyond calculus. Additional requirements vary by area as noted in each section.
- **Grade Point Average** At least 3.00/4.00 for the final 60 semester hours (90 quarter hours) of undergraduate study, and an average of 3.00 in all mathematics courses beyond calculus.
- **Tests Required** Neither the GRE General Exam nor the subject exams are required. Applicants may still submit GRE scores; however, an absence of GRE scores will not negatively impact their application.
- **Minimum English Competency Test Score**
  - **TOEFL iBT** 100, with subscores of Reading 19, Listening 17, Speaking 20, and Writing 21 **OR**,
  - **IELTS Academic** 7.0, with 7.0 in each of the four subscores, **OR**,
  - **PTE-Academic** 68, with subscores of Reading 66, Listening 66, Speaking 66, and Writing 66.
- **Letters of Recommendation** Three required from persons familiar with the applicant's academic work.
- **Personal Statement** Required.
- **Prerequisites**
  - *Concentration in Pure Mathematics:*
    - Linear Algebra (MATH 320 or equivalent)
    - Abstract Algebra (MATH 330 or equivalent)
    - One year of analysis (MATH 313 and one of MATH 410 or MATH 414, or equivalent)
  - *Concentration in Applied Mathematics:*
    - Differential Equations (MATH 220 or equivalent)
    - Linear Algebra (MATH 310 or MATH 320, or equivalent)
    - One year of analysis (MATH 313 and one of MATH 410 or MATH 414, or equivalent)
  - *Concentration in Mathematical Computer Science:*
    - Data Structures (MCS 360 or equivalent) or Symbolic Computation (MCS 320 or equivalent)
    - Discrete Mathematics (MCS 361 or equivalent)
    - Linear Algebra (MATH 310 or MATH 320, or equivalent)
    - Experience in programming and computing: the successful applicant will show proficiency in all requirements above, either through coursework or relevant work experience.

## Degree Requirements

In addition to the Graduate College minimum requirements, students must meet the following program requirements:

- **Minimum Semester Hours Required** 32.
- **Coursework** At least 24 hours must be in mathematics courses, of which 12 hours must be at the 500 level. The student must complete a course of study in one of the following concentrations or,

in exceptional cases approved by the Graduate Studies Committee, a general program of study without a concentration can be followed.

## Concentration in Pure Mathematics

Code	Title	Hours
<b>Concentration Requirements</b>		
MATH 414	Analysis II	
or MATH 533	Real Analysis I	
MATH 417	Complex Analysis with Applications	
MATH 431	Abstract Algebra II	
or MATH 516	Second Course in Abstract Algebra I	
Select at least two additional courses from:		
MATH 430	Formal Logic I	
MATH 435	Foundations of Number Theory	
MATH 442	Differential Geometry of Curves and Surfaces	
MATH 445	Introduction to Topology I	
MATH 517	Second Course in Abstract Algebra II	
MATH 533	Real Analysis I	

Remaining courses to be selected in consultation with an advisor. Other courses may be substituted with the permission of the director of graduate studies.

Students must do one of the following: Pass a written comprehensive examination in pure mathematics or write a thesis and pass an oral defense.

## Concentration in Applied Mathematics

Code	Title	Hours
<b>Concentration Requirements</b>		
MATH 417	Complex Analysis with Applications	
MCS 471	Numerical Analysis	
MATH 481	Applied Partial Differential Equations	
Select at least one course from:		
MATH 414	Analysis II	
MATH 480	Applied Differential Equations	
MATH 539	Functional Analysis I	
MATH 576	Classical Methods of Partial Differential Equations	
MATH 585	Ordinary Differential Equations	
MCS 571	Numerical Analysis of Partial Differential Equations	

Remaining courses to be selected in consultation with an advisor. Other courses may be substituted with the permission of the director of graduate studies.

Students must do one of the following: Pass a written comprehensive examination in applied mathematics or write a thesis and pass an oral defense.

## Concentration in Mathematical Computer Science

Code	Title	Hours
<b>Concentration Requirements</b>		
MCS 401	Computer Algorithms I	
or MCS 441	Theory of Computation I	
MCS 421	Combinatorics	

or MCS 423 Graph Theory

MCS 471 Numerical Analysis

or MCS 481 Computational Geometry

Remaining courses to be selected in consultation with an advisor. Other courses may be substituted with permission of the director of graduate studies.

Students must do one of the following: Pass a written comprehensive examination in mathematical computer science or write a thesis and pass an oral defense.

## Other Requirements

- **Comprehensive Examination** Optional. Students who do not pass a written comprehensive examination must complete a thesis.
- **Thesis, Project, or Coursework-Only Options** Thesis or coursework only (with written comprehensive examination). No other options are available.