

# MATHEMATICS, MS

Banner Code: SC-MS-MATH

## Academic Advising

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 Website: [science.gmu.edu/academics/departments-units/mathematical-sciences/mathematics-ms](http://science.gmu.edu/academics/departments-units/mathematical-sciences/mathematics-ms)

This program provides exciting opportunities for students interested in studying advanced mathematics.

## Assistantships

A limited number of merit-based teaching assistantships are available for students taking at least 6 graduate credits each semester. Other sources of support, such as research assistantships, are available as funding permits. Graduate students also have the opportunity to work in the Math Tutoring Center (<http://math.gmu.edu/tutor-center.php>).

## Admissions & Policies

### Admissions

University-wide admissions policies can be found in Graduate Admissions Policies (<http://catalog.gmu.edu/admissions/graduate-policies/>).

To apply for this program, please complete the George Mason University Admissions Application (<https://www2.gmu.edu/admissions-aid/apply-now/>).

Applicants interested in this program must submit three letters of recommendation. GRE scores are not required.

Students must have taken an upper-division course in advanced calculus (equivalent to MATH 315 Advanced Calculus I), an abstract algebra course (equivalent to MATH 321 Abstract Algebra) and an upper-division course in linear algebra (equivalent to MATH 322 Advanced Linear Algebra). Students should have some computer knowledge.

### Policies

For policies governing all graduate programs, see AP.6 Graduate Policies (<http://catalog.gmu.edu/policies/academic/graduate-policies/>).

MATH 500 through MATH 614 cannot be used for credit, with the exception of MATH 555 Actuarial Modeling I and MATH 556 Actuarial Modeling II.

## Requirements

### Degree Requirements

Total credits: 30

Students should refer to the Admissions & Policies tab for specific policies related to this program.

## Coursework

Code	Title	Credits
<b>Required Courses</b>		
MATH 675	Linear Analysis	3
<b>Coursework Options</b>		
Select three from the following:		9
MATH 621	Algebra I	
MATH 631	Topology I: Topology of Metric Spaces	
MATH 677	Ordinary Differential Equations	
MATH 685	Numerical Analysis	
<b>Additional Approved Coursework</b>		
Select four approved graduate courses, at least two of which are MATH courses. <sup>1</sup>		12
Total Credits		24

<sup>1</sup>

All four courses must be approved by the student's advisor. Courses not listed as MATH courses must be approved by the graduate committee.

Different rules apply if the student wishes to count graduate actuarial courses toward his or her degree (consult the graduate coordinator).

### Research and Creative Component

A student may fulfill the research and creative component in one of three ways: Thesis Option, Paper Presentation Option, or Preliminary Exams for the PhD.

Code	Title	Credits
Select one of the Research and Creative Component options outlined below		6
Total Credits		6

#### Thesis Option

In preparation for this option, the student must form a committee comprising a chair and two other faculty members. The chair and at least one other member must be from the Department of Mathematical Sciences (<http://catalog.gmu.edu/colleges-schools/science/mathematical-sciences/>), one member may be from a related field.

The student completes a thesis under the direction of the committee chair. The thesis work is typically completed while students are registered for 6 credits of MATH 799 MS Thesis. A thesis proposal and thesis are submitted in accordance with AP.6 Graduate Policies (<http://catalog.gmu.edu/policies/academic/graduate-policies/>). The student must give an oral defense of the thesis to the committee and the George Mason University community at large. Students are expected to respond to questions on the thesis and related material. The committee determines whether the defense is satisfactory.

Code	Title	Credits
Thesis Option		6
MATH 799	MS Thesis	
Total Credits		6

### Paper Presentation Option

In preparation for this option, the student must form a committee comprising a chair and two other faculty members. The chair and at least one other member must be from the Department of Mathematical Sciences (<http://catalog.gmu.edu/colleges-schools/science/mathematical-sciences/>), one member may be from a related field. The student gives an oral presentation of a paper (or series of papers or book chapter) chosen in consultation with the chair of the committee and approved by the full committee. The chosen material must be distinct from work completed in fulfillment of course requirements. The oral presentation is given to the committee and the Mason community at large. Students are expected to respond to questions on the paper and related material. The committee determines whether the defense is satisfactory.

Code	Title	Credits
	Select 6 additional credits of electives	6
	Total Credits	6

### Preliminary Exams for the PhD

The research and creative component can also be fulfilled by passing three preliminary written examinations, as required for the Mathematics, PhD (<http://catalog.gmu.edu/colleges-schools/science/mathematical-sciences/mathematics-phd/>) degree.

## Dual Degree Options

### Mathematics and Statistical Science Dual-Degree MS

This program allows students to earn an MS in Mathematics and an MS in (<http://catalog.gmu.edu/colleges-schools/engineering/statistics/statistical-science-ms/>) Statistical Science (<http://catalog.gmu.edu/colleges-schools/engineering-computing/school-computing/statistics/statistical-science-ms/>) by completing 48 credits of coursework in both areas instead of the 60 that would be required if the degrees were sought independently.

### Admission Requirements

Applicants must satisfy admission requirements for both the MS in Mathematics and the MS in Statistical Science (<http://catalog.gmu.edu/colleges-schools/engineering-computing/school-computing/statistics/statistical-science-ms/>) programs. A joint faculty committee from the Department of Mathematical Sciences (<http://catalog.gmu.edu/colleges-schools/science/mathematical-sciences/>) and the Department of Statistics (<http://catalog.gmu.edu/colleges-schools/engineering-computing/school-computing/statistics/>) make final admission decisions into the dual-degree program.

### MS-MATH/STAT Dual-Degree Requirements

Total credits: 48

Code	Title	Credits
MATH 621	Algebra I	3
MATH 675	Linear Analysis	3
MATH 677 or MATH 678	Ordinary Differential Equations Partial Differential Equations	3
MATH 685	Numerical Analysis	3
STAT 544	Applied Probability	3

STAT 554	Applied Statistics I	3
STAT 634	Case Studies in Data Analysis	3
STAT 652	Statistical Inference	3
STAT 654	Applied Statistics II	3
Total Credits		27

### Electives

Code	Title	Credits
	Select 12 elective credits in MATH courses numbered 615 or higher ( <a href="http://catalog.gmu.edu/courses/math/">http://catalog.gmu.edu/courses/math/</a> ) <sup>1</sup>	12
	Select any STAT courses numbered 540-775 ( <a href="http://catalog.gmu.edu/courses/stat/">http://catalog.gmu.edu/courses/stat/</a> )	9
Total Credits		21

<sup>1</sup>

Excluding MATH 653 Construction and Evaluation of Actuarial Models I, MATH 654 Construction and Evaluation of Actuarial Models II, MATH 655 Pension Valuation, and MATH 799 MS Thesis

### Notes:

- Students in either the BS/Accelerated MS in Mathematics program or the BS(selected)/Accelerated MS in Statistical Science (<http://catalog.gmu.edu/colleges-schools/engineering-computing/school-computing/statistics/statistical-science-ms/#acceleratedmasterstext>) program cannot get a reduction of 6 credits toward this dual degree. Students who want to proceed to a PhD degree will only be able to waive the number of credits specified in the associated PhD degree requirements, even though they will have 48 credits at the MS level.
- If a student decides not to complete the required 48 credits, a single MS degree will not be granted unless the student fulfills the requirements for either the MS in Mathematics or the MS in Statistical Science (<http://catalog.gmu.edu/colleges-schools/engineering-computing/school-computing/statistics/statistical-science-ms/>).
- Once a student receives one of the MS degrees from either department, the student will no longer be eligible for the reduction in credit (i.e., will need to complete 30 credits) if the student later decides to earn the other MS degree.

## Accelerated Master's

### Mathematics, BA or BS/Mathematics, Accelerated MS

#### Overview

This bachelor's/accelerated master's degree program allows academically strong undergraduates with a commitment to advance their education to obtain the Mathematics, BA (<http://catalog.gmu.edu/colleges-schools/science/mathematical-sciences/mathematics-ba/>) or Mathematics, BS (<http://catalog.gmu.edu/colleges-schools/science/mathematical-sciences/mathematics-bs/>) and the Mathematics, MS degrees within an accelerated timeframe. Upon completion of this 138 credit accelerated program, students will be exceptionally well prepared for entry into their careers or into a doctoral program in the field or in a related discipline.

Students are eligible to apply for this accelerated program once they have earned at least 60 undergraduate credits and can enroll in up to

18 credits of graduate coursework after successfully completing 75 undergraduate credits. This flexibility makes it possible for students to complete a bachelor's and a master's in five years.

For more detailed information, see AP.6.7 Bachelor's/Accelerated Master's Degrees (<http://catalog.gmu.edu/policies/academic/graduate-policies/#ap-6-7>). For policies governing all graduate degrees, see AP.6 Graduate Policies (<http://catalog.gmu.edu/policies/academic/graduate-policies/>). For more information on undergraduates enrolling in graduate courses, see AP.1.4.4 Graduate Course Enrollment by Undergraduates (<https://catalog.gmu.edu/policies/academic/registration-attendance/#text>).

## Application Requirements

Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Graduate Admission Policies (<http://catalog.gmu.edu/admissions/graduate-policies/>) section of this catalog.

Important application information and processes for this accelerated master's program can be found here (<https://www2.gmu.edu/admissions-aid/how-apply/accelerated-masters/>).

Students should seek out the graduate program's advisor who will aid in choosing the appropriate graduate courses and help prepare the student for graduate studies.

Successful applicants will have an overall undergraduate GPA of at least 3.00. Additionally, they will have completed the following courses with a GPA of 3.00 or higher.

Code	Title	Credits
MATH 315	Advanced Calculus I	3
MATH 321	Abstract Algebra	3
MATH 322	Advanced Linear Algebra	3

## Accelerated Option Requirements

After the completion of 75 undergraduate credits, students may complete 3 to 12 credits of graduate coursework that can apply to both the undergraduate and graduate degrees.

In addition to applying to graduate from the undergraduate program, students in the accelerated program must submit a bachelor's/accelerated master's transition form (available from the Office of the University Registrar (<https://registrar.gmu.edu/forms/>)) to the College of Science's Office of Academic and Student Affairs (<https://cos.gmu.edu/about/contact-us/>) by the last day to add classes of their final undergraduate semester. Students should enroll for courses in the master's program in the fall or spring semester immediately following conferral of the bachelor's degree, but should contact an advisor if they would like to defer up to one semester.

Students must maintain an overall GPA of 3.00 or higher in all graduate coursework and should consult with their faculty advisor to coordinate their academic goals.

## Reserve Graduate Credit

Accelerated master's students may also take up to 6 graduate credits as reserve graduate credits. These credits do not apply to the undergraduate degree, but will reduce the master's degree by up to 6 credits. With 12 graduate credits counted toward the undergraduate and graduate

degrees plus the maximum 6 reserve graduate credits, the credits necessary for the graduate degree can be reduced by up to 18.

## Graduate Course Suggestions

The following list of suggested courses is provided for general reference. To ensure an efficient route to graduation and post-graduation readiness, students are strongly encouraged to meet with an advisor before registering for graduate-level courses.

Code	Title	Credits
MATH 621	Algebra I	3
MATH 631	Topology I: Topology of Metric Spaces	3
MATH 675	Linear Analysis	3
MATH 677	Ordinary Differential Equations	3
MATH 685	Numerical Analysis	3