

# GEOINFORMATICS AND GEOSPATIAL INTELLIGENCE, MS

**Banner Code:** SC-MS-GEOI

## Graduate Advising

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The program addresses the emerging demand for scientists trained in the collection, organization, analysis, and dissemination of information about physical features, man-made structures, moving objects, people, and events that are geo-referenced or geo-located. This program focuses primarily on the computational approaches that support the synthesis and analysis of diverse types of data in order to identify and monitor complex events and phenomena that manifest over space and time. While geospatial intelligence has a strong Department of Defense connotation, the principles behind it have a significant dual use potential, addressing the needs of a broader audience, ranging for example from intelligent navigation in urban spaces to emergency response systems for natural and man-made disasters.

The MS is designed to expose students to fundamental theoretical principles and practical applications involving:

- Geographic Information Science
- Digital image analysis as it applies to geoinformatics and geospatial intelligence
- Computational principles for geoinformatics and intelligence

## Admissions & Policies

### Admissions

University-wide admissions policies can be found in the Graduate Admissions Policies (<https://catalog.gmu.edu/admissions/graduate-policies/>) section of this catalog. International students and students having earned international degrees should also refer to Admission of International Students (<https://catalog.gmu.edu/admissions/international-students/>) for additional requirements.

### Eligibility

In addition to the university-wide requirements, applicants for this master's should hold a BA or BS degree in a discipline related to the program's theme from an institution of higher education accredited by a Mason-recognized U.S. institutional accrediting agency or international equivalent, including courses in differential and integral calculus.

A working knowledge of a computer programming language is a plus.

When the background of an individual student does not meet the program's requirements, remedial or preparatory courses tailored to student's needs may be recommended.

## Application Requirements

To apply for this program, prospective students should submit the George Mason University Admissions Application (<https://www2.gmu.edu/admissions-aid/apply-now/>) and its required supplemental documentation, two letters of recommendation, and a goals statement.

GRE scores are not required for admission into this program, but are encouraged if the student is seeking internal funding.

## Policies

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

## Transferring Previous Graduate Credit into this Program

Previously earned and relevant graduate credits may be eligible for transfer into this program; details can be found in the Credit by Exam or Transfer (<https://catalog.gmu.edu/policies/academic/graduate-policies/>) section of this catalog.

## Secondary Program Options

Students enrolled in this master's program have the option of adding a secondary graduate certificate program. Depending upon the secondary program chosen, many courses may be applicable to both the certificate and the master's. Before adding a secondary program, students are advised to carefully review AP.6.8 Requirements for Graduate Certificates (<https://catalog.gmu.edu/policies/academic/graduate-policies/#ap-6-8>) and AP.6.9 Requirements for Master's Degrees (<https://catalog.gmu.edu/policies/academic/graduate-policies/#ap-6-9>). Faculty advisors should be contacted for further guidance and for graduate certificate program suggestions.

## Requirements

### Degree Requirements

Total credits: 30

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

### Core Courses

Code	Title	Credits
GG5 553	Geographic Information Systems	3
GG5 579	Remote Sensing	3
GG5 664	Spatial Data Structures	3
GG5 684	Selected Topics in Geospatial Intelligence	3
GG5 685	Capstone Course in Geoinformatics	3
GG5 787	Scientific Data Mining for Geoinformatics	3
<b>Total Credits</b>		<b>18</b>

## Thesis or Non-thesis Option

Code	Title	Credits
Students choose the culminating experience of either a thesis or a project and a comprehensive exam (either must total 3 credits). The same graduate-level quality will be expected from either option:		3
<b>Thesis Option</b>		
GGG 799	Thesis (3 credits)	
<b>Non-thesis Option</b>		
GGG 700	Comprehensive Exam (1 credit)	
GGG 798	Master's Research Project (2 credits)	
<b>Total Credits</b>		<b>3</b>

## Electives

Code	Title	Credits
Select three courses from the groupings below, with no more than two courses from a single group (courses must be taken from at least two groups): <sup>1</sup>		9
<b>Image Analysis:</b>		
GGG 562	Photogrammetry	
GGG 622	Drone Remote Sensing	
GGG 626	Physical Fundamentals of Remote Sensing	
GGG 629	Remote Sensing of the Environment and Earth System	
GGG 680	Earth Image Processing	
GGG 740	Hyperspectral Imaging Systems	
GGG 760	Advanced Topics in Remote Sensing	
GGG 840	Hyperspectral Imaging Applications	
<b>Geographic Information Science:</b>		
GGG 563	Advanced Geographic Information Systems	
GGG 653	GIS Analysis and Application	
GGG 655	Geovisualization	
GGG 675	Location Science	
GGG 791	Advanced Spatial Statistics	
<b>Computational Geoinformatics:</b>		
GGG 631	Spatial Agent-Based Models of Human-Environment Interactions	
GGG 632	Spatial Modeling for Public Health	
GGG 650	Introduction to GIS Algorithms and Programming	
GGG 681	Social Media Analysis	
GGG 692	Web-based Geographic Information Systems	
GGG 754	Earth Science Data and Advanced Data Analysis	
GGG 773	Interoperability of Geographic Information Systems	
GGG 788	Deep Learning for Geoinformation	
<b>Total Credits</b>		<b>9</b>

<sup>1</sup> Course selections must be approved by the program coordinator.

## Accelerated Master's

### Bachelor's Degree (any)/Geoinformatics and Geospatial Intelligence, Accelerated MS

#### Overview

Offered by the Department of Geography and Geoinformation Sciences (GGG) (<https://catalog.gmu.edu/colleges-schools/science/geography-geoinformation-science/>) in the College of Science (<https://catalog.gmu.edu/colleges-schools/science/>), this bachelor's/accelerated master's degree program enables highly qualified undergraduates to obtain any Mason bachelor's degree and the Geoinformatics and Geospatial Intelligence, MS degrees within an accelerated timeframe. The program strategy enables students to undertake graduate coursework during their final year in the bachelor's degree. In the case of a 120 credit bachelor's program, this accelerated master's option can be completed as a 138 credit program. This accelerated pathway prepares students for professional careers where geoinformation management, geographic analysis, and geointelligence and geovisualization are of importance.

Students in this accelerated degree program must fulfill all university requirements for the bachelor's program and the Geoinformatics and Geospatial Intelligence, MS. While the information below is largely comprehensive, students are strongly encouraged to also review AP.6.7 Bachelor's/Accelerated Master's Degrees (<https://catalog.gmu.edu/policies/academic/graduate-policies/#ap-6-7>).

#### Application Requirements

Students with an overall GPA of at least 3.0 may apply for provisional acceptance into this accelerated master's program after completing at least 60 undergraduate credits. Additionally, students must have completed the following courses with a combined GPA of 3.0 or better: GGS 300 Quantitative Methods for Geographical Analysis, GGS 311 Geographic Information Systems, and any one upper level GGS-prefixed course.

Applicants to all graduate programs at Mason must meet the admission standards and application requirements for graduate study as specified in the Admissions section of this catalog. However, this accelerated master's does not require GRE test scores, letters of recommendation, CV/resume, or a statement of interest.

During the bachelor's degree status, accelerated master's students must complete the graduate courses indicated on their Accelerated Master's Program Application (obtained from the Office of Academic and Student Affairs) with a minimum grade of B- in each course. They must maintain a minimum GPA of 3.0 in all coursework and in coursework applied to their major.

At the beginning of their final undergraduate semester, they must submit the Bachelor's/Accelerated Master's Transition Form (found on the Office of the University Registrar website). Students are encouraged to begin their master's program in the semester immediately following the term of undergraduate degree conferral, but may elect to delay enrollment in for one semester. Students should consult with their faculty advisor in the Department of Geography and Geoinformation Science and the Office of Academic and Student Affairs to obtain further guidance.

## Accelerated Option Requirements

Students admitted to this program may start taking graduate courses after completing 75 undergraduate credits. It is recommended that students register for one of the following courses in their first semester of accelerated coursework:

Code	Title	Credits
GGS 553	Geographic Information Systems	3
GGS 579	Remote Sensing	3
GGS 664	Spatial Data Structures	3
GGS 684	Selected Topics in Geospatial Intelligence	3

Including the course chosen above, up to 12 credits of graduate coursework may be applied to both undergraduate degree and the master's degree. If students earn at least a B- in these classes, they are granted advanced standing in the master's program and must then complete 18 additional credits to receive the master's degree. All other master's degree requirements must be met.

## Reserve Graduate Credit

During the bachelor's degree status, students may take up to 6 graduate credits as reserve graduate credit. These credits do not apply to the undergraduate degree, but will reduce the subsequent master's degree credits accordingly. With 12 credits counted toward the undergraduate and graduate degrees plus the maximum 6 reserve credits, the credits necessary for the graduate degree can be reduced by up to 18. The ability to take courses for reserve graduate credit is available to all high achieving undergraduates with the permission of the department. To apply the reserved credits to the master's degree, students must request their transfer from the undergraduate degree to the graduate degree via the Bachelor's/Accelerated Master's Transition Form found on the Office of the University Registrar website.