

# GEOGRAPHY, BS

**Banner Code:** SC-BS-GEOG

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The Geography, BS is designed to offer students the opportunity to study the integrated social and environmental processes that continuously shape and reshape the world we live in. This major provides students with broad training across the core subdisciplines of geography (human, physical, and GIScience), emphasizing application and technique-driven coursework, in addition to a rigorous science and mathematics curriculum. Students will find numerous opportunities for employment in both the private and public sectors, as well as in academia. Given their interdisciplinary approach and uniquely spatial perspective, geographers are well suited to address important local, regional, and global challenges in today's world.

The Department of Geography and Geoinformation Science (<http://catalog.gmu.edu/colleges-schools/science/geography-geoinformation-science/>) fosters a supportive, active learning environment in which students are encouraged to work closely with both faculty and peers. The curriculum in this major provides students with the analytical, technical, and practical training that prepares them to be successful in an ever-evolving job market. For students who wish to pursue their interest in geography via a more flexible degree program, the department also offers a Geography, BA (<http://catalog.gmu.edu/colleges-schools/science/geography-geoinformation-science/geography-ba/>).

## Admissions & Policies

### Admissions

University-wide admissions policies can be found in the Undergraduate Admissions Policies (<http://catalog.gmu.edu/admissions/undergraduate-policies/>) section of this catalog.

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

### Policies

Students must fulfill all Requirements for Bachelor's Degrees (<http://catalog.gmu.edu/policies/academic/undergraduate-policies/#text>) including the Mason Core (<http://catalog.gmu.edu/mason-core/>).

GGG 415 Seminar in Geography fulfills the writing intensive requirement.

For policies governing all undergraduate programs, see AP.5 Undergraduate Policies (<http://catalog.gmu.edu/policies/academic/undergraduate-policies/>).

## Requirements

### Degree Requirements

Total credits: minimum 120

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

### Geography

Candidates for the Geography, BS degree must complete the following Core, Breadth and Experience, and Geography Elective courses with a minimum GPA of 2.00:

#### Core Courses

| Code          | Title   | Credits |
|---------------|---|---------|
| GGG 102       | Physical Geography (Mason Core) ( <a href="http://catalog.gmu.edu/mason-core/">http://catalog.gmu.edu/mason-core/</a> )                 | 3-4     |
| or GGS 121    | Dynamic Atmosphere and Hydrosphere (Mason Core) ( <a href="http://catalog.gmu.edu/mason-core/">http://catalog.gmu.edu/mason-core/</a> ) |         |
| GGG 103       | Human Geography (Mason Core) ( <a href="http://catalog.gmu.edu/mason-core/">http://catalog.gmu.edu/mason-core/</a> )                    | 3       |
| GGG 110       | Introduction to Geoinformation Technologies   | 3       |
| or GGS 210    | Introduction to Spatial Computing   |         |
| GGG 300       | Quantitative Methods for Geographical Analysis  | 3       |
| GGG 310       | Introduction to Digital Cartography   | 3       |
| GGG 311       | Introduction to Geographic Information Systems  | 3       |
| GGG 379       | Remote Sensing  | 3       |
| GGG 400       | Colloquium in Geoinformation Science  | 1       |
| GGG 415       | Seminar in Geography <sup>1</sup>   | 3       |
| Total Credits |   | 25-26   |

<sup>1</sup> Fulfills the writing intensive requirement.

#### Breadth and Experience Courses

| Code                              | Title  | Credits |
|-----------------------------------|--|---------|
| <b>Advanced Technique Courses</b> |  |         |
| Select three from the following:  |  | 9       |
| GGG 308                           | Field Mapping Techniques                             |         |
| GGG 354                           | Data Analysis and Global Change Detection Techniques |         |
| GGG 410                           | Introduction to Hyperspectral Imaging                |         |
| GGG 411                           | Advanced Digital Cartography                         |         |
| GGG 412                           | Air Photography Interpretation                       |         |
| GGG 416                           | Satellite Image Analysis                             |         |
| GGG 422                           | Drone Remote Sensing                                 |         |
| GGG 462                           | Web Mapping  |         |
| GGG 463                           | RS: Applied Geographic Information Systems           |         |
| GGG 470                           | Special Topics in Geographic Techniques              |         |

#### Systematic Courses

|                                |   |
|--------------------------------|---|
| Select one from the following: | 3   |
| GGG 301                        | Political Geography   |
| GGG 302                        | Global Environmental Hazards  |
| GGG 303                        | Geography of Resource Conservation (Mason Core) ( <a href="http://catalog.gmu.edu/mason-core/">http://catalog.gmu.edu/mason-core/</a> ) |
| GGG 304                        | Population Geography (Mason Core) ( <a href="http://catalog.gmu.edu/mason-core/">http://catalog.gmu.edu/mason-core/</a> )               |
| GGG 305                        | Economic Geography  |
| GGG 306                        | Urban Geography   |
| GGG 307                        | Geographic Approaches for Sustainable Development   |
| GGG 309                        | Meteorology and Climate   |
| GGG 312                        | Physical Climatology  |
| GGG 314                        | Severe and Extreme Weather  |
| GGG 319                        | Air Pollution   |
| GGG 321                        | Biogeography  |
| GGG 322                        | Issues in Global Change   |
| GGG 340                        | Health Geography  |
| GGG 344                        | Military Geography  |
| GGG 357                        | Urban Planning  |
| GGG 398                        | Selected Topics in Global Change  |
| GGG 399                        | Select Topics in GGS  |
| GGG 456                        | Introduction to Atmospheric Radiation   |

**Regional Courses**

|                                |   |
|--------------------------------|---|
| Select one from the following: | 3   |
| GGG 315                        | Geography of the United States                |
| GGG 316                        | Geography of Latin America                    |
| GGG 317                        | Geography of China                            |
| GGG 320                        | Geography of Europe                           |
| GGG 325                        | Geography of North Africa and the Middle East |
| GGG 326                        | Geography of Eastern Europe and Russia        |
| GGG 330                        | Geography of the Soviet Succession States     |
| GGG 333                        | Issues in Regional Geography                  |
| GGG 380                        | Geography of Virginia                         |

Total Credits 15

**Geography Electives**

| Code  | Title | Credits |
|---|-------|---------|
| Select 3 credits of undergraduate-level GGS courses |       | 3       |
| Select 6 credits of 300 or 400-level GGS courses    |       | 6       |
| Total Credits                                       |       | 9       |

**Outside Requirements**

Candidates for the Geography, BS degree must complete the following courses from outside of Geography and Geoinformation Science:

| Code     | Title   | Credits |
|----------|---|---------|
| CDS 130  | Computing for Scientists  | 3       |
| MATH 113 | Analytic Geometry and Calculus I (Mason Core) ( <a href="http://catalog.gmu.edu/mason-core/">http://catalog.gmu.edu/mason-core/</a> ) | 4       |
| MATH 114 | Analytic Geometry and Calculus II   | 3-4     |

|             |  |
|-------------|--|
| or IT 207   | Applied IT Programming   |
| or STAT 250 | Introductory Statistics I (Mason Core) ( <a href="http://catalog.gmu.edu/mason-core/">http://catalog.gmu.edu/mason-core/</a> ) |

Total Credits 10-11

**Mason Core and Elective Credits**

In order to meet a minimum of 120 credits, this degree requires an additional 59-61 credits, which may be applied toward any remaining Mason Core (<http://catalog.gmu.edu/mason-core/>) requirements, Requirements for Bachelor's Degrees (<http://catalog.gmu.edu/policies/academic/undergraduate-policies/#ap-5-3-2>), and elective courses. Students are strongly encouraged to consult with their advisors to ensure that they fulfill all requirements.

**Mason Core**

Some Mason Core (<http://catalog.gmu.edu/mason-core/>) requirements may already be fulfilled by the major requirements listed above. Students are strongly encouraged to consult their advisors to ensure they fulfill all remaining Mason Core (<http://catalog.gmu.edu/mason-core/>) requirements.

| Code   | Title | Credits |
|--|-------|---------|
| <b>Foundation Requirements</b>   |       |         |
| Written Communication (ENGH 101) ( <a href="http://catalog.gmu.edu/mason-core/#written">http://catalog.gmu.edu/mason-core/#written</a> )   |       | 3       |
| Oral Communication ( <a href="http://catalog.gmu.edu/mason-core/#oral">http://catalog.gmu.edu/mason-core/#oral</a> )   |       | 3       |
| Quantitative Reasoning ( <a href="http://catalog.gmu.edu/mason-core/#quantitative">http://catalog.gmu.edu/mason-core/#quantitative</a> )   |       | 3       |
| Information Technology and Computing ( <a href="http://catalog.gmu.edu/mason-core/#information-technology">http://catalog.gmu.edu/mason-core/#information-technology</a> )                       |       | 3       |
| <b>Exploration Requirements</b>  |       |         |
| Arts ( <a href="http://catalog.gmu.edu/mason-core/#arts">http://catalog.gmu.edu/mason-core/#arts</a> )   |       | 3       |
| Global Understanding ( <a href="http://catalog.gmu.edu/mason-core/#global">http://catalog.gmu.edu/mason-core/#global</a> )   |       | 3       |
| Literature ( <a href="http://catalog.gmu.edu/mason-core/#literature">http://catalog.gmu.edu/mason-core/#literature</a> )   |       | 3       |
| Natural Science ( <a href="http://catalog.gmu.edu/mason-core/#natural-science">http://catalog.gmu.edu/mason-core/#natural-science</a> )  |       | 7       |
| Social and Behavioral Sciences ( <a href="http://catalog.gmu.edu/mason-core/#social-behavioral-science">http://catalog.gmu.edu/mason-core/#social-behavioral-science</a> )                       |       | 3       |
| Western Civilization/World History ( <a href="http://catalog.gmu.edu/mason-core/#western-civilization-world-history">http://catalog.gmu.edu/mason-core/#western-civilization-world-history</a> ) |       | 3       |
| <b>Integration Requirements</b>  |       |         |
| Written Communications (ENGH 302) ( <a href="http://catalog.gmu.edu/mason-core/#written">http://catalog.gmu.edu/mason-core/#written</a> )  |       | 3       |
| Writing-Intensive ( <a href="http://catalog.gmu.edu/mason-core/#wi">http://catalog.gmu.edu/mason-core/#wi</a> ) <sup>1</sup>   |       | 3       |
| Synthesis/Capstone ( <a href="http://catalog.gmu.edu/mason-core/#synthesis-capstone">http://catalog.gmu.edu/mason-core/#synthesis-capstone</a> ) <sup>2</sup>                                    |       | 3       |
| Total Credits  |       | 40      |

<sup>1</sup> Most programs include the writing-intensive course designated for the major as part of the major requirements; this course is therefore not counted towards the total required for Mason Core.

<sup>2</sup> Minimum 3 credits required.

## Accelerated Master's

### Geography, BS/Geographic and Cartographic Sciences, Accelerated MS

#### Overview

Offered by the Department of Geography and Geoinformation Sciences (GGS) in the College of Science, this bachelor's/accelerated master's degree program enables highly qualified undergraduates to obtain the Geography, BS and the Geographic and Cartographic Sciences, MS (<http://catalog.gmu.edu/colleges-schools/science/geography-geoinformation-science/geographic-cartographic-sciences-ms/>) degrees within an accelerated timeframe. The program strategy enables students to undertake graduate coursework during their final year in the bachelor's degree. This 144 credit program (thesis option) or 151 credit program (comprehensive exam option) prepares students for professional careers where geoinformation management, geographic analysis, and geospatial visualization are of importance.

Students in this accelerated degree program must fulfill all university requirements for the Geography, BS and the Geographic and Cartographic Sciences, MS (<http://catalog.gmu.edu/colleges-schools/science/geography-geoinformation-science/geographic-cartographic-sciences-ms/>). While the information below is largely comprehensive, students are strongly encouraged to also review AP.6.7 Bachelor's/Accelerated Master's Degrees (<http://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 75-100 undergraduate credits. Additionally, they must have completed the following courses with a combined GPA of 3.0 or better: GGS 300 Quantitative Methods for Geographical Analysis, GGS 311 Introduction to 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.

While being undergraduate students, accelerated master's students must complete the two 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 must begin their master's program in the semester immediately following the term of undergraduate degree conferral. 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 90 undergraduate credits. Up to 6 credits of graduate

coursework may be applied to both the 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 24 (thesis option) or 31 (comprehensive exam option) 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 (e.g., with 6 credits counted towards undergraduate degree plus the maximum 6 reserve credits, the master's degree can be completed with 18 (thesis option) or 25 (comprehensive exam option) graduate credits). 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.

### Geography, BS/Geoinformatics and Geospatial Intelligence, Accelerated MS

#### Overview

Offered by the Department of Geography and Geoinformation Sciences (GGS) in the College of Science, this bachelor's/accelerated master's degree program enables highly qualified undergraduates to obtain the Geography, BS and the Geoinformatics and Geospatial Intelligence, MS (<http://catalog.gmu.edu/colleges-schools/science/geography-geoinformation-science/geoinformatics-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. This 147 credit program 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 Geography, BS and the Geoinformatics and Geospatial Intelligence, MS (<http://catalog.gmu.edu/colleges-schools/science/geography-geoinformation-science/geoinformatics-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 (<http://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 75-100 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 Introduction to 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.

While being undergraduate students, accelerated master's students must complete the two 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 must begin their master's program in the semester immediately following the term of undergraduate degree conferral. 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 90 undergraduate credits. Up to 6 credits of graduate coursework may be applied to both the 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 27 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 (e.g., with 6 credits counted towards undergraduate degree plus the maximum 6 reserve credits, the master's degree can be completed with 21 graduate credits). 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.