

# GEOSPATIAL ANALYSIS

## Degree: B.A., Geography

Department of Geography (<https://cas.umw.edu/geography/>)

The Geography Department hosts two majors and a certificate in Geographic Information Science. Majors in Geography and in Geospatial Analysis both lead to the Bachelor of Arts degree in Geography.

Geography is the study of the interaction between people and their environments, both natural and human. Geographers examine the places and regions resulting from such interaction and analyze the spatial characteristics of all manner of cultural, economic, political, and physical processes and relationships. Students in the Geospatial Analysis major take foundational thematic geography courses, and specialize in geospatial technologies.

Geospatial Analysis majors may study geographic information systems, spatial analysis, remote sensing, the global positioning system, web-GIS and GIS programming. Students will tailor their interests in geospatial technologies to one or more areas in geography, such as planning, economic development, or environmental studies. Majors are also encouraged to engage in internships, study abroad programs, and undergraduate research.

Facilities for geographic studies at Mary Washington include well-equipped laboratories for the study and practice of physical geography, GIS, cartography, and remote sensing. The department hosts a chapter of Gamma Theta Upsilon, the International Geography Honorary Society.

During the senior year qualified students may pursue Honors in Geography by completing an independent research project and writing and defending a thesis.

The knowledge and skills gained by majoring in Geospatial Analysis position graduates for careers as geospatial specialists in a variety of fields, including government agencies and private businesses, research institutions and health organizations, planning agencies and non-profit institutions.

## Student Learning Outcomes

1. Students will understand the key concepts within the integrated discipline of geography.
2. Students will read, interpret, and critique a map.
3. Students will identify, understand, and critique spatial data or evidence, whether qualitative, quantitative, or cartographic.
4. Students will apply a suitable geographical approach, technique, or method within a research project.
5. Students will identify personal strengths and areas of expertise within geography.

A minimum of 41-43 credits in Geography, Geographic Information Science, and related fields.

| Code                     | Title                           | Credits   |
|--------------------------|---------------------------------|-----------|
| <b>Core Requirements</b> |                                 | <b>21</b> |
| GEOG 102                 | Introduction to Human Geography |           |
| GEOG 111                 | Landform Processes              |           |
| GEOG 245                 | Environment and Society         |           |

|   |  |              |
|---|--|--------------|
|   | or GEOG 240 Hazards and Resilience                                   |              |
| GISC 250  | Introduction to Geographic Information Systems and Cartography       |              |
|   | or GISC 200 Introduction to GIS                                      |              |
| GISC 351  | Spatial Analysis   |              |
| GEOG 490  | Senior Seminar in Geography  |              |
| <b>Foundation (choose one)</b>  |  | <b>3</b>     |
| CPSC 110  | Introduction to Computer Science                                     |              |
| DATA 101  | Introduction to Data Science   |              |
| GEOG 252  | Quantitative Methods in Geography                                    |              |
| <b>GIS Electives</b>  |  | <b>11-12</b> |
| Take 11-12 credits of the following                                   |  |              |
| GISC 340  | Remote Sensing and Air Photo Interpretation                          |              |
| GISC 355  | Mobile Geographic Information Systems and Global Positioning Systems |              |
| GISC 450  | GIS Programming  |              |
| GISC 471  | Special Topics   |              |
| GISC 482  | Web GIS: Concepts and Applications                                   |              |
| GISC 491  | Directed Study in GIS  |              |
| GISC 499  | GIS Internship   |              |
| <b>Geography Electives</b>  |  | <b>6-7</b>   |
| Take two GEOG classes, at least one at 300- or 400-level <sup>1</sup> |  |              |
| <b>Total Credits</b>  |  | <b>41-43</b> |

Certificate in Geographic Information Science can be found by using this link (<https://catalog.umw.edu/undergraduate/minors/geographic-information-science-certificate/>).

## General Education Requirements

The general education requirements for Bachelor of Arts/Bachelor of Science degrees (<https://catalog.umw.edu/undergraduate/general-education/requirements-bachelor-arts-bachelor-science-degrees/>) apply to all students who are seeking to earn an undergraduate B.A., B.S. or B.S.Ed. degree.

Students seeking a Bachelor of Liberal Studies degree have a separate set of BLS general education requirements (<https://catalog.umw.edu/undergraduate/general-education/requirements-bachelor-liberal-studies-degrees/>).

## Electives

Elective courses are those that are not needed to fulfill a general education requirement or major program requirement but are chosen by the student to complete the 120 credits required for graduation with a B.A./B.S./B.S.Ed. degree or the BLS degree. These courses may be taken graded or pass/fail (or S/U in the case of physical education and 100-level dance). No student in a regular B.A./B.S./B.S.Ed. program may count more than 60 credits in a single discipline toward the 120 credits required for graduation.

**Total Credits Required for the Degree:** 120 credits

## Plan of Study

This suggested plan of study should serve as a guide to assist students when planning their course selections. It is not a substitute for a student's Degree Evaluation or the Program Requirements listed for this

major in the catalog. Academic planning is the student's responsibility, and course selections should be finalized only after speaking with an advisor. Students should familiarize themselves with the catalog in effect at the time they matriculated at the University of Mary Washington. Students should also familiarize themselves with general education requirements (<https://catalog.umw.edu/undergraduate/general-education/>) which can be fulfilled through general electives as well as major/minor course requirements. Course requirements and sequencing may vary with AP, IB, CLEP, Cambridge or previous coursework, transfer courses, or other conditions. To be considered full-time, an undergraduate student must be enrolled in 12 or more credits for the semester.

| Course                                   | Title   | Credits        |
|--|---|----------------|
| <b>Freshman</b>                          |   |                |
| <b>Fall</b>                              |   |                |
| FSEM 100                                 | First-Year Seminar  | 3              |
| GEOG 102                                 | Introduction to Human Geography   | 3              |
| General Education Courses                |   | 9              |
| <b>Credits</b>                           |   | <b>15</b>      |
| <b>Spring</b>                            |   |                |
| GISC 250<br>or GISC 200                  | Introduction to Geographic Information Systems and<br>Cartography<br>or Introduction to GIS     | 4              |
| General Education Courses                |   | 12             |
| <b>Credits</b>                           |   | <b>16</b>      |
| <b>Sophomore</b>                         |   |                |
| <b>Fall</b>                              |   |                |
| GISC 351                                 | Spatial Analysis  | 4              |
| Breadth Requirement (Society & Politics) |   | 3              |
| General Education Courses or Electives   |   | 9              |
| <b>Credits</b>                           |   | <b>16</b>      |
| <b>Spring</b>                            |   |                |
| DATA 101<br>or CPSC 106<br>or GEOG 252   | Introduction to Data Science<br>or Digital Storytelling<br>or Quantitative Methods in Geography | 3              |
| GEOG 111                                 | Landform Processes  | 4              |
| Breadth Requirement (Environment)        |   | 3-4            |
| General Education Courses or Electives   |   | 4              |
| <b>Credits</b>                           |   | <b>14-15</b>   |
| <b>Junior</b>                            |   |                |
| <b>Fall</b>                              |   |                |
| Upper Level GISC Requirement             |   | 4              |
| Breadth Requirement (Culture)            |   | 3              |
| General Education Courses or Electives   |   | 9              |
| <b>Credits</b>                           |   | <b>16</b>      |
| <b>Spring</b>                            |   |                |
| Upper Level GISC Requirement             |   | 4              |
| General Electives                        |   | 9              |
| <b>Credits</b>                           |   | <b>13</b>      |
| <b>Senior</b>                            |   |                |
| <b>Fall</b>                              |   |                |
| GEOG 490                                 | Senior Seminar in Geography   | 3              |
| General Electives                        |   | 12             |
| <b>Credits</b>                           |   | <b>15</b>      |
| <b>Spring</b>                            |   |                |
| Upper Level GEOG Requirement             |   | 3              |
| General Electives                        |   | 12             |
| <b>Credits</b>                           |   | <b>15</b>      |
| <b>Total Credits</b>                     |   | <b>120-121</b> |

Dawn S. Bowen, Career Advisor

## Professors

Dawn S. Bowen  
Stephen P. Hanna  
Farhang Rouhani

## Associate Professors

Caitlin C. Finlayson  
Jacqueline Gallagher  
Marco Millones Mayer  
Joseph W. Nicholas  
Melina A. Patterson  
Ping Yin

## Geography Faculty

Melina A. Patterson, Chair