

# GEOGRAPHY, MS

## Related Certificates

- Certificate in Geographic Information Systems (GIS) (<http://uwm.edu/graduateschool/geographic-information-systems-certificate>)

## Overview

The Department of Geography offers both master's and doctoral programs of study across a range of systematic, regional, and technical fields, with innovative energy in the doctoral program for studying urban environments. The department's overall strengths are aligned along a theme of "Changing Environments," with three major axes, each responsive to areas with strong demand for new professionals:

- **Urban Environments:** This area emphasizes the spatial interactions of economic systems as well as political, social, cultural, environmental, technological, and other forces that influence the people, identities, landscape, development, and dynamics of urban areas. With the world's population becoming increasingly urbanized and globalized, courses examine the continuing challenges of urban growth and change, race, ethnicity, and gender in the city, immigration and identity politics, and spatial aspects of urban planning processes and political decision-making.
- **Physical Geography and Environmental Studies:** This area addresses the interactions among natural forms and processes on the earth's surface, the impact and implications of global climate change, and human connections with those natural phenomena. Courses discuss and analyze the distribution and processes of earth surface landforms (geomorphology), soils (pedology), plants and animals (biogeography), water (hydrology), and long-term atmospheric conditions (climatology). Overlapping emphases include phenology, water resources, conservation, natural hazards, natural resource scarcity, and the mounting challenges of global environmental change.
- **Geographic Information Science (GIS):** This area emphasizes using geospatial technology to further understanding of spatial interactions among natural and social forces at multiple scales across the Earth's surface, and exploring the impacts of using such technology on social and cultural interactions. Courses examine geographic information collection (including remote sensing), data analysis and geocomputation (spatial analysis), information presentation (cartography), and societal implications. Our program emphasizes applications of GIS in urban, regional, and environmental planning, policy making, and public health.

In addition to these departmental strengths, individual faculty members apply their expertise in topics such as remote sensing, GIS, and cartography to problems of the city. Geography faculty also participate in the certificate program in Geographic Information Systems, which is jointly offered by the College of Letters and Science and the School of Architecture and Urban Planning.

While the master's program offers a more traditional structure within which students can strengthen their knowledge of the discipline and one or more of its subfields, the department's unique PhD program is designed to be especially attractive to forward-looking students interested in the urban environment who seek a flexible, versatile, 21st century graduate education with a strong emphasis on interdisciplinarity. The PhD program's urban-environmental theme is inclusive and encompassing of processes and problems associated with the

intersection of human and natural environments, strongly focused on "the city" as the entity of engagement. The program breaks with longstanding tradition in the field of geography in stressing a balance between specialized analytical research and synthetic research, between traditional academic research and community engagement, and between research and teaching. It relies heavily on Geographic Information Science (GIS) as a research tool and as an organizing framework.

## Facilities and Resources

The University of Wisconsin–Milwaukee is the repository of the venerable American Geographical Society Library, an internationally renowned research resource. The Department of Geography boasts a large instructional Map Collection, which functions as a federal government depository for maps; and a Soils and Physical Geography Laboratory, which supports research projects among several UWM departments.

Other research resources at UWM available to the Geography Department staff and students include the Cartography and GIS Center, the School of Freshwater Sciences, the Center for Economic Development, the Center for Latin American and Caribbean Studies, the Center for International Education, the Center for Urban Transportation Studies, Women's and Gender Studies, the Digital Humanities Lab, the Center for 21st Century Studies, and University Information Technology Services.

## Admission Requirements

### Application Deadlines

Application deadlines vary by program, please review the application deadline chart (<http://uwm.edu/graduateschool/program-deadlines>) for specific programs. Other important dates and deadlines can be found by using the One Stop calendars (<https://uwm.edu/onestop/dates-and-deadlines>).

### Master of Science in Geography

The MS is awarded to those who concentrate in physical geography. Students must elect to pursue either the MA or MS option during their first semester in the program. A minimum of 6 credits in physical geography or natural science courses appropriate to the student's area of study are required for the MS. Students may also elect to complete their degree through either a thesis or non-thesis track.

### Admission

An applicant must meet Graduate School requirements (<http://uwm.edu/graduateschool/admission>) plus these departmental requirements to be considered for admission to the program:

1. Evidence of general intellectual ability and compelling interest in geography. An undergraduate major in geography is desirable as evidence of such ability and interest but is not required. Past coursework will be compared to the core requirements of the UWM Geography bachelor's degree in order to determine any deficiencies that need to be satisfied as a condition of acceptance.
2. Submission to the Geography department of three letters of recommendation supporting application.
3. Submission of recent GRE (<http://uwm.edu/graduateschool/admission/#gre>) scores.
4. Departmental approval, based on thorough evaluation of applicant's potential for professional development.

### Track Options

MS students may choose the Standard or the GIS Professional Track.

## Credits and Courses

### A. Standard Track

The Standard Track is the only option for MA students. Both M.A. and M.S. degrees are offered in the standard track. The M.A. normally is awarded to those who concentrate in cultural or human geography, whereas the M.S. is awarded to those who concentrate in physical geography. Students must elect to pursue either the M.A. or M.S. option during their first semester in the program. A minimum of 6 credits in physical geography or natural science courses appropriate to the student's area of study are required for the M.S. Students may also elect to complete their degree through either a thesis or non-thesis option.

The two options have the same coursework requirements except for the capstone project. Details are provided below

Minimum degree requirement is 30 graduate credits with an average GPA of 3.0. The student, in consultation with the advisor, plans a program of studies to include:

Code	Title	Credits
GEOG 726	Geographic Information Science	4
GEOG 747	Spatial Analysis	4
GEOG 810	Introduction to Techniques of Research and Presentation	3
GEOG 870	Contemporary Geographic Approaches:	3
12 credits in graduate-level (700 and above) courses approved by the student's advisor (at least 3 of these credits must be in one Geography graduate seminar course)		12
4 credits in the student's capstone project (see Thesis Option and Non-Thesis Option information below)		4
Total Credits		30

The student also must attend Geography colloquia regularly while in residence and must present her/his thesis research at a departmental colloquium.

### Thesis Option

The student must register at least 4 credits of GEOG 890 Research and Master's Thesis (approved by the student's advisor). In addition, the student, through the advisor, must present a proposed thesis topic and Advisory Committee to the Graduate Faculty of the Department for its approval. For students electing the M.S. option, the Faculty will also judge the appropriateness of the thesis topic for that degree.

The student must then write a thesis acceptable to the major professor for presentation to the Advisory Committee (two faculty members in addition to the advisor). The defense date for the thesis must be set at least two weeks prior to the Graduate School deadline for completion of all work. The thesis must be approved by the advisor and delivered to the committee at least six weeks prior to the defense date. Students must submit the thesis to the advisor in sufficient time to meet the committee deadline. Exceptions to these deadlines under unusual circumstances must be approved unanimously by the student's committee. In addition to submission of the final thesis to the Graduate School (according to their required procedure), the candidate must present the Geography Department with a professionally hard-bound copy which meets Graduate School specifications for quality. This copy will remain on file in the department.

### Non-Thesis Option

This option is intended for students who are not interested in continuing their graduate education beyond the master's degree, and plan to seek professional employment. The M.A. degree will normally be awarded upon completion of this option. Those who wish a M.S. degree must formally petition the Graduate Faculty in writing, providing a rationale as to why that degree is appropriate to their program. The student must complete at least 4 credits of graduate work (approved by the student's advisor) as either:

- Two research papers (GEOG 999) Students pursuing the non-thesis option through the two-research paper option must choose two separate topics, and conduct extended literature reviews on the topics, although other possibilities, such as a small research project, should not be excluded. The papers are expected to be 25-50 pages apiece. The student is expected to have an oral defense with three committee members regarding the two papers. According to current guidelines, the student is not expected to present their papers to the colloquium series.

OR

- A graduate internship (GEOG 798 or GEOG 889 (note that GEOG 810 is a prerequisite for GEOG 889). Students pursuing the non-thesis option through the graduate internship should conduct at least 180 hours of internship. The internship should be related to the student's academic area of interest and must be approved by the advisor. The student is expected to write a scholarly paper of 25-50 pages in length that connects the internship to the appropriate literature. The student must have a committee of three faculty members, and is expected to go through an oral defense with the committee members regarding the internship paper. According to current guidelines, the student is not expected to present their internship paper to the colloquium series.

### B. GIS Professional Track

This track is intended for students who plan to seek professional employment in the field of GIS and are not interested in continuing their graduate education beyond the master's degree. Only M.S. degrees are offered in the GIS professional track.

Minimum degree requirement is 30 graduate credits with an average GPA of 3.0. The student, in consultation with the advisor, plans a program of studies to include:

Code	Title	Credits
GEOG 726	Geographic Information Science	4
GEOG 747	Spatial Analysis	4
GEOG 704	Remote Sensing: Environmental and Land Use Analysis	4
GEOG 826	Intermediate Geographic Information Science	4
GEOG 705	Cartography	4
Electives		6
GEOG 798	GIS/Cartography Internship (capstone project)	4
Total Credits		30

The student also must attend Geography colloquia regularly while in residence.

**Elective Courses**

<b>Code</b>	<b>Title</b>	<b>Credits</b>
Select two of the following:		
GEOG 926	Advanced Geographic Information Science: Geographic Modeling	3
GEOG 834	GIS and Society	3
GEOG 960	Seminar: Geographic Techniques:	3
GEOG 804	Advanced Remote Sensing	3
GEOG 904	Remote Sensing and Urban Analysis	3
GEOG 827	Qualitative Research	3
URBPLAN 791	Introduction to Urban Geographic Information Systems for Planning	3
URBPLAN 792	Using Urban Geographic Information Systems (GIS) for Planning	3
URBPLAN 793	Applied Projects in Urban Geographic Information Systems	3
URBPLAN 794	Internet Geographic Information Systems (GIS)	3
GEOG 716	Watershed Analysis and Modeling	3
GEOG 730	Geography of Transportation	3
GEOG 748	ArcGIS Programming with Python	4
BUS ADM 749	Data and Information Management	3

**Program Requirements****A. Standard Track****Comprehensive Examination**

In combination with the thesis defense (or after completion of the work for the non-thesis option), the student must pass a final oral examination over the field of geography, administered by the student's Advisory Committee. Scheduling this examination during the summer is not permitted except under unusual academic circumstances and with the approval of the department faculty.

**B. GIS Professional Track****Capstone Project (GEOG 798)**

Students pursuing the GIS professional track should conduct at least 180 hours of internship. The internship should be related to the field of GIS and must be approved by the advisor. The student is expected to write a scholarly paper of 25-50 pages in length that connects the internship to the appropriate literature. The student must have a committee of three faculty members, and is expected to go through an oral defense with the committee members regarding the internship paper. According to current guidelines, the student is not expected to present their internship paper at the colloquium series.