

GEOGRAPHIC INFORMATION SCIENCE - M.GISC

College of Arts and Sciences
 Department of Geography
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Description

The Master of Geographic Information Science degree prepares graduates for analytical and managerial positions that utilize geospatial technologies in three professional areas: cyber-infrastructure, environment and health. The program consists of three concentrations:

- The **CyberGIS** concentration focuses on the challenges of managing, filtering, analyzing and visualizing large volumes of spatiotemporal data from mobile devices, web-based services and supercomputers. This knowledge prepares graduates to work in government and industry and provide the expertise to enable scientists, businesses and policymakers to gain new insights from large spatial datasets.
- The **Environmental Geographic Information Science** concentration focuses on the use of geographic information science to understand environmental changes and hazards. Practitioners in the fields of emergency management, public safety and homeland security rely on geospatial technologies and mapping for planning, response, mitigation and recovery activities. Geographic information science is a key contributor to obtaining situation awareness in cases of natural and human-technological events. Jobs are available for geographic information science-skilled professionals at all levels of government and in private-sector consulting.
- The **Geographic Information Science and Health** concentration focuses on the use of geographic information science and allied geospatial technologies that have become widespread in the study of health and in management of healthcare resources. Geographic information science skills are needed through all levels of health-related agencies in government, and are becoming standard across private industry and non-profits in this area. From understanding and preventing epidemics around the world, to identifying healthy lifestyle resources in a neighborhood, geographic information science has proven invaluable in adding the necessary spatial insight for improved health quality and outcomes. Students who choose this concentration will graduate with the highly-valued technical skillset to advance these goals in health research and management.

Fully Offered At:

- Online

Admission Requirements

- Bachelor's degree from an accredited college or university in geography or a related field¹ for unconditional admission
- Minimum 3.000 undergraduate GPA on a 4.000 point scale for unconditional admission

- Official transcript(s)
- Goal statement
- Two letters of recommendation
- English language proficiency - all international students must provide proof of English language proficiency (unless they meet specific exceptions) by earning one of the following:
 - Minimum 550 TOEFL PBT score (paper-based version)
 - Minimum 79 TOEFL IBT score (Internet-based version)
 - Minimum 77 MELAB score
 - Minimum 6.5 IELTS score
 - Minimum 58 PTE score

For more information about graduate admissions, please visit the Graduate Studies admission website. For more information on international admission, visit the Office of Global Education's admission website.

¹ Requirement that undergraduate degree be in geography or related field may be waived with evidence of professional experience using geospatial technologies or alternative evidence of ability to excel in a geographic information science graduate program.

Program Learning Outcomes

Graduates of this program will be able to:

1. Collect, edit, integrate, manage and analyze geospatial data.
2. Demonstrate skills and working knowledge of commercial and open source GIS application suites and utilities.
3. Identify, explain and analyze spatial patterns, relationships and processes.
4. Apply cartographic principles and techniques to create quality maps.
5. Apply critical and spatial thinking to solve geospatial problems with respect to theories, principles and practices of geographic information science and fields in the degree concentration areas.
6. Demonstrate good communication skills and ability to work in a team environment.

Program Requirements

Major Requirements

Code	Title	Credit Hours
Major Requirements		
GEOG 59071	FUNDAMENTALS OF GEOGRAPHIC INFORMATION SCIENCE I	3
GEOG 59081	FUNDAMENTALS OF GEOGRAPHIC INFORMATION SCIENCE II	3
GEOG 69164	CARTOGRAPHIC DESIGN	3
GEOG 69392	PRACTICUM IN GEOGRAPHIC INFORMATION SCIENCE ¹	6
Major Electives, choose from the following:		6-8
CS 61002	ALGORITHMS AND PROGRAMMING I	
CS 61003	ALGORITHMS AND PROGRAMMING II	
DSCI 64210	DATA SCIENCE	
GEOG 52052	MEDICAL GEOGRAPHY	
GEOG 59072	GEOGRAPHIC INFORMATION SCIENCE AND HEALTH ²	

GEOG 59075	GEOGRAPHIC INFORMATION SCIENCE:APPLICATIONS FOR SOCIAL PROBLEMS	
GEOG 59076	SPATIAL PROGRAMMING ²	
GEOG 59078	GEOGRAPHIC INFORMATION SCIENCE AND ENVIRONMENTAL HAZARDS ²	
GEOG 69004	QUANTITATIVE METHODS IN GEOGRAPHY	
GEOG 69007	SPATIOTEMPORAL ANALYTICS	
GEOG 69073	GEOGRAPHIC INFORMATION SCIENCE: GLOBAL HEALTH ²	
GEOG 69074	GEOGRAPHIC INFORMATION SCIENCE: SPATIAL ANALYSIS FOR HEALTH GEOGRAPHY ²	
GEOG 69079	ENVIRONMENTAL GEOGRAPHIC INFORMATION SCIENCE ²	
GEOG 69082	CYBERGIS ²	
GEOG 69083	GEODATABASES ²	
GEOG 69231	ENVIRONMENTAL REMOTE SENSING ²	

Concentrations

Choose from the following:	9
CyberGIS	
Environmental Geographic Information Science	
Geographic Information Science and Health	

Minimum Total Credit Hours: 30

¹ As the capstone to the program, students will complete a practicum that is designed to provide practical experience in the application of MGISc degree course content in real-world professional settings. Students will select a professional project in consultation with their employer and program faculty and then will design, implement and report on their activities in a culminating professional paper.

² Required courses in the student's concentration cannot be also applied toward the major electives.

CyberGIS Concentration Requirements

Code	Title	Credit Hours
GEOG 59076	SPATIAL PROGRAMMING	3
GEOG 69082	CYBERGIS	3
GEOG 69083	GEODATABASES	3
Minimum Total Credit Hours:		9

Environmental Geographic Information Science Concentration Requirements

Code	Title	Credit Hours
GEOG 59078	GEOGRAPHIC INFORMATION SCIENCE AND ENVIRONMENTAL HAZARDS	3
GEOG 69079	ENVIRONMENTAL GEOGRAPHIC INFORMATION SCIENCE	3
GEOG 69231	ENVIRONMENTAL REMOTE SENSING	3
Minimum Total Credit Hours:		9

Geographic Information Science and Health Concentration Requirements

Code	Title	Credit Hours
GEOG 59072	GEOGRAPHIC INFORMATION SCIENCE AND HEALTH	3

GEOG 69073	GEOGRAPHIC INFORMATION SCIENCE: GLOBAL HEALTH	3
GEOG 69074	GEOGRAPHIC INFORMATION SCIENCE: SPATIAL ANALYSIS FOR HEALTH GEOGRAPHY	3
Minimum Total Credit Hours:		9

Graduation Requirements

- Students must complete a minimum of 30 credit hours and select one concentration. Students are permitted to specialize in maximum two concentrations.