

GEOGRAPHIC INFORMATION SCIENCE AND TECHNOLOGY - MASTER OF SCIENCE (ONLINE)

Overview

The Master of Science in Geographic Information Science & Technology (GIS&T) at New Mexico State University is New Mexico's only fully online master's program in GIS&T. Designed for working professionals and recent graduates, this flexible and applied program equips students with the technical expertise and analytical skills needed to succeed in today's geospatial workforce.

The 100% asynchronous online format allows students to complete their degree from anywhere while maintaining access to NMSU's expert faculty, research resources, and professional network. With a flexible time frame and an emphasis on applied learning, the program enables students to develop specialized expertise while balancing work, education, and other commitments.

A Practical and Industry-Focused Curriculum

The M.S. in GIS&T program provides students with a comprehensive foundation in GIS&T theory, methods, and applications, while allowing them to tailor their studies to their interests and career goals.

The 30-31 credit curriculum includes:

- **Core Courses (20 credits):** Establishes a solid foundation in cartography, GIS, remote sensing, spatial analysis, spatial modeling, programming, and professional ethics.
- **Elective Course (3-4 credits):** Allows students to develop specialized skills in specific methods (e.g., remote sensing) or application areas (e.g., water resources).
- **Capstone Project (6 credits):** A hands-on, applied project where students work with an external partner to solve a real-world problem, culminating in a technical report and presentation at the Digital Symposium.
- **Professional Portfolio (1 credit):** A digital showcase of the student's expertise, professional experience, and GIS&T accomplishments.

Students may substitute certain core courses with faculty approval, ensuring the curriculum meets their professional background and career objectives.

Real-World Experience & Industry Connections

A hallmark of the M.S. in GIS&T program is its strong connection to government agencies, private industry, and nonprofits. Students engage in applied GIS&T projects with external partners, including:

- City, county, state, and federal agencies (e.g., City of Las Cruces, Doña Ana County, U.S. Geological Survey, U.S. Department of Agriculture, New Mexico Department of Health).

- Private-sector firms (e.g., ESRI, SWCA Environmental Consultants, Bohannon Huston Inc.).
- Nonprofit organizations (e.g., Nature Conservancy, Gila Conservation Coalition, Friends of Organ Mountains Desert Peaks).

These collaborations allow students to gain hands-on experience, build their professional network, and apply GIS&T methods to real-world environmental, social, and technological challenges.

Who Should Apply?

The M.S. in GIS&T is ideal for:

- Working professionals seeking to advance their careers in geospatial careers.
- Recent graduates looking to enter the GIS&T workforce with a strong applied skill set.
- Professionals from other fields (e.g., environmental science, urban planning, engineering, public health) who want to integrate GIS&T into their work.

A background in geography or GIS&T is not required, though students without prior geospatial coursework may need to take foundational courses. Prospective students are encouraged to consult with the Graduate Program Director for guidance on program preparation.

Career Pathways

Graduates of the M.S. in GIS&T program find job opportunities in diverse fields, including urban and regional planning, environmental consulting and sustainability, natural resource management, emergency and disaster management, geospatial intelligence and defense, public health and epidemiology, data science, surveying and engineering, and geospatial analytics.

With expertise in spatial data acquisition, programming, analysis, modeling, and visualization, students are well-prepared for high-demand careers in both the public and private sectors.

Program Learning Outcomes

Upon completion of the M.S. in GIS&T, students will be able to:

1. Evaluate basic and advanced concepts, methods, and applications in geographic information science and technology.
2. Solve real-world problems by acquiring, analyzing, interpreting, evaluating, and visualizing spatial data.
3. Conduct all stages of an independent research project, including conceptualization, planning, implementation, management, and communication.

More Information

See the Requirements tab for details on course and credit expectations for earning the M.S. in GIS&T, and the Roadmap tab for a suggested course sequence.

Course and Credit Requirements

The Master of Science in Geographic Information Science and Technology (GIS&T) program curriculum is composed of a minimum of 30 graduate credits, including 20 required core credits, 3-4 elective credits, and 7 credits aimed at the completion of a capstone project and the

development of a professional portfolio. All courses are offered as 8-week online courses.

- The **Core Courses** (20 credits) are designed to give students a solid common foundation in GIS&T theory, methods, and applications relevant for today's geospatial professionals.
 - Students who are already proficient in areas covered by one or more of these core courses (e.g., due to prior academic or work experience) may substitute them (Students will work with a faculty advisor to develop an alternative customized curriculum that meets their needs.).
- The **Elective Course** (3-4 credits) allows students to develop specialized knowledge and skills in their areas of interest.
- The **Capstone Project** (6 credits) requires students to design and implement an applied GIS&T project in their area of interest and expertise with guidance from a faculty advisor and in collaboration with an external partner. The project culminates in a) a written technical report, peer-reviewed publication, or comparable document and b) a formal oral presentation during the Digital Symposium, a public symposium hosted at the end of each semester by the GIS&T master's program for our external partners and the geospatial community at NMSU. Examples of external partners include and are not limited to the following:
 - City, county, state, and federal government agencies like the City of Las Cruces, Doña Ana County, New Mexico Fish and Wildlife Conservation Office, New Mexico Department of Transportation, New Mexico Department of Health, United States Geological Survey, United States Department of Agriculture, and Department of Defense units like White Sands Missile Range and the National Geospatial Intelligence Agency.
 - Companies like SWCA Environmental Consultants, Bohannon Huston Inc., Wilson & Company Inc., Merrick & Company, ESRI, L3Harris Geospatial, or Maxar Technologies.
 - Nonprofits like the Southern New Mexico Trail Alliance, Friends of Organ Mountains Desert Peaks, Gila Conservation Coalition, Taos Land Trust, New Mexico Land Conservancy, Nature Conservancy, World Wildlife Fund, or United States Fund for UNICEF."
- The **Professional Portfolio** (1 credit) is a digital representation of the student's accomplishments in the master's program and knowledge and skills as a geospatial professional.

Prefix	Title	Credits
Course Requirements		
GEOG 571	Cartography and GIS ¹	4
GEOG 578	Fundamentals of GIS	4
GEOG 573	Introduction to Remote Sensing ¹	4
GEOG 542	Programming for GIS	3
GEOG 585	Spatial Analysis and Modeling	3
GEOG 545	Geospatial Professionalism	2
GEOG 544	GIS&T Professional Portfolio	1
GEOG 505	GIS&T Capstone I - Geospatial Research Design	3
GEOG 506	GIS&T Capstone II - Geospatial Research Implementation	3
Choose one of the following electives:		3-4
GEOG 582	Advanced Remote Sensing	
GEOG 588	GIS for Water Resources	
Total Credits		30-31

A Suggested Plan of Study for Students

The following tables are examples of what students' curricula might look like if they started in either the Fall or the Spring semester and then took the typical course load of two courses per each of four semesters and one summer.

Fall Start

First Year		Credits
Fall		
GEOG 578	Fundamentals of GIS ¹	4
GEOG 573	Introduction to Remote Sensing ¹	4
Credits		8
Spring		
GEOG 571	Cartography and GIS	4
GEOG 542	Programming for GIS	3
Credits		7
Summer		
GEOG 505	GIS&T Capstone I - Geospatial Research Design	3
GEOG 545	Geospatial Professionalism	2
Credits		5
Second Year		
Fall		
GEOG 585	Spatial Analysis and Modeling	3
Choose one of the following electives:		3-4
GEOG 582	Advanced Remote Sensing	
GEOG 588	GIS for Water Resources	
Credits		6-7
Spring		
GEOG 506	GIS&T Capstone II - Geospatial Research Implementation	3
GEOG 544	GIS&T Professional Portfolio	1
Credits		4
Total Credits		30-31

Spring Start

First Year		Credits
Fall		
GEOG 585	Spatial Analysis and Modeling	3
GEOG 573	Introduction to Remote Sensing	4
Credits		7
Spring		
GEOG 571	Cartography and GIS ¹	4
GEOG 542	Programming for GIS	3
Credits		7
Summer		
GEOG 505	GIS&T Capstone I - Geospatial Research Design	3
GEOG 545	Geospatial Professionalism	2
Credits		5
Second Year		
Spring		
GEOG 578	Fundamentals of GIS	4
Choose one of the following electives:		3-4
GEOG 473	Advanced Remote Sensing	
GEOG 488	GIS for Water Resources	
Credits		7-8

Summer

GEOG 506	GIS&T Capstone II - Geospatial Research Implementation	3
GEOG 544	GIS&T Professional Portfolio	1
	Credits	4
	Total Credits	30-31