

# MASTER OF SCIENCE IN GEOGRAPHIC INFORMATION SYSTEMS

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The applied Geographic Information System (GIS) graduate program will give students the critical knowledge to succeed in the challenging world of geospatial technologies. This includes advanced classes and labs in GIS (ArcGIS, ArcGIS Pro, and ArcGIS Online); remote sensing (ERDAS IMAGINE); web-based mapping; model builder; programming; spatial database; and spatial analysis. In particular, this program is designed to enhance an individual's knowledge in geographic information science and technology. Additionally, applications of the technology in the oil and gas industry, public health sector, parcel mapping, local government, law enforcement, national security, and market research are featured.

The GIS master's program offers two tracks; a **Traditional track** (thesis and non-thesis option) that offers a mix of face-to-face and online classes and a **Professional track** that is offered completely online.

The traditional track (thesis and non-thesis option) of the GIS master's degree is geared towards students with no prior experience/background in GIS or for students who have completed an undergraduate degree with no work experience.

The professional track is geared towards professionals who are engaged in the geospatial industry for at least 2 -3 years, utilizing GIS/Remote Sensing for their day-to-day operations and decision making, and aspiring for an advanced degree in GIS. The goal of the professional track is to train employed and experienced professionals from the GIS industry with strong scientific and geospatial qualifications, geospatial management and business skills, and an in-depth understanding of GIS ethics and ethical practices in geospatial business.

**Additional information:** Reference the Program Landing Page (<https://www.shsu.edu/programs/graduate/geographic-information-systems/>) for additional information, such as cost, delivery format, contact information, or to schedule a visit.

Applicants seeking admission to the **Master of Science in Geographic Information Systems** must submit the following directly to the Office of Graduate Admissions (<https://www.shsu.edu/dept/graduate-admissions/prospective-students.html>):

1. Graduate Application (<http://www.shsu.edu/admissions/apply-texas.html>)
2. Application fee (<http://www.shsu.edu/dept/graduate-studies/application-fee.html>)
3. Official transcript(s) of all previous college work (international students must submit third party evaluation of official transcripts for degrees from universities outside the United States)
4. TOEFL scores for international students.
5. Two letters of recommendation from faculty in the student's major at the degree-granting institution.

Applicants seeking admission to the **Master of Science in Geographic Information Systems: Professional Track** must submit the following directly to the Office of Graduate Admissions (<https://www.shsu.edu/dept/graduate-admissions/prospective-students.html>):

1. Graduate Application (<http://www.shsu.edu/admissions/apply-texas.html>)
2. Application fee (<http://www.shsu.edu/dept/graduate-studies/application-fee.html>)
3. Official transcript(s) of all previous college work (international students must submit third party evaluation of official transcripts for degrees from universities outside the United States).
4. TOEFL scores for international students
5. Two letters of recommendation one from faculty in the student's major at the degree-granting institution and the other from an immediate supervisor.
6. Resume
7. Statement of purpose that explains:
  - a. Description of current and past involvement and employment using GIS and Remote Sensing technologies
  - b. Expected outcome of program
  - c. Intent of degree

The degree requires successful completion of thirty-six hours of graduate credit. Students must also take a graduate comprehensive exam and successfully pass the exam. A written comprehensive examination is administered by a comprehensive exam advisory committee for each degree candidate. The written examination must be scheduled with the GIS Graduate Program Coordinator at least four weeks in advance. Students must be enrolled the semester in which they take the comprehensive examination.

Requirements specified in the degree plan are subject to minor modification. All graduate coursework must be approved by the GIS Graduate Program Coordinator.

**Plan 1 - MS in Geographic Information Systems (Non-Thesis Option)**

Code	Title	Hours
<b>Master of Science in Geographic Information Systems (Non-thesis option)</b>		
<b>Specified Courses</b>		
GEOG 5362	GIS Principles and Application	3
GEOG 5363	Web GIS	3
GEOG 5364	Spatial Analysis	3
GEOG 5365	Digital Image Processing	3
GEOG 5366	Cartography And Visualization	3
GEOG 5367	GIS Programming	3
GEOG 5310	GIS Project Management	3
GEOG 5312	GIS ModelBuilder	3
<b>Elective Courses</b>		
Select four of the following:		12
GEOG 5311	GIS in Law Enforcement	
GEOG 5313	Ethics in GIS	
GEOG 5314	GIS for Professionals	
GEOG 5315	Spatial Database	
GEOG 5371	Geographic Information Systems in Energy-Related Fields	
GEOG 5373	Introduction to LiDAR & Radar	
<b>Total Hours</b>		<b>36</b>

**Plan 2 - MS in Geographic Information Systems (Thesis Option)**

Code	Title	Hours
<b>Master of Science in Geographic Information Systems (Thesis option)</b>		
<b>Specified Courses</b>		
GEOG 5362	GIS Principles and Application	3
or GEOG 5314	GIS for Professionals	
GEOG 5364	Spatial Analysis	3
GEOG 5365	Digital Image Processing	3
GEOG 5366	Cartography And Visualization	3
GEOG 5367	GIS Programming	3
GEOG 5310	GIS Project Management	3
GEOG 5312	GIS ModelBuilder	3
GEOG 5313	Ethics in GIS	3
GEOG 5363	Web GIS	3
GEOG 5373	Introduction to LiDAR & Radar	3
or GEOG 5315	Spatial Database	
<b>Thesis</b>		
GEOG 6398	Thesis I	3
GEOG 6099	Thesis II <sup>1</sup>	3
<b>Total Hours</b>		<b>36</b>

<sup>1</sup> Once enrolled in GEOG 6099, students must continuously enroll in this course until graduation.

**Plan 3 - MS in Geographic Information Systems (Professional Track)**

Code	Title	Hours
<b>Master of Science in Geographic Information Systems (Professional Track)</b>		
<b>Specified Courses</b>		
GEOG 5310	GIS Project Management	3
GEOG 5312	GIS ModelBuilder	3
GEOG 5313	Ethics in GIS	3

GEOG 5314	GIS for Professionals	3
GEOG 5315	Spatial Database	3
GEOG 5363	Web GIS	3
GEOG 5364	Spatial Analysis	3
GEOG 5365	Digital Image Processing	3
GEOG 5367	GIS Programming	3
GEOG 5369	Internship in GIS	3
or GEOG 5366	Cartography And Visualization	
GEOG 5371	Geographic Information Systems in Energy-Related Fields	3
GEOG 5373	Introduction to LiDAR & Radar	3

**Total Hours** **36**

The MS in Geographic Information Systems is designed to provide graduates with the following marketable skills:

- Hands-on technical skills in GIS and Remote Sensing softwares, viz. ArcGIS Pro, ArcGIS Online for Organizations (AGOL), ERDAS Imagine, QGIS, etc.
- Comprehensive understanding of the data models and structures used in the input, management, analysis, and output of various geographic data.
- Use Python programming language to complete geoprocessing tasks. Ability to carry out specialized tasks, such as map scripting, debugging, error handling, creating and sharing custom tools using Python scripts, and creating Python functions and classes in ArcGIS environment.
- Thorough understanding of the critical steps necessary in order to successfully implement a GIS project within an organization and ability to conduct evaluations of GIS-related technology and assess their appropriateness for a particular purpose, project or application.
- Share GIS content on the Web or across the enterprise; publish maps, imagery, and geoprocessing models on the web; create and publish feature templates for use in Web applications that support visualization, analysis, and editing of GIS resources.
- Knowledge of image acquisition, image enhancement, image restoration, color image processing, image segmentation, image compression, image recognition, image quality assessment, and statistical evaluation and change detection.
- Cartographic visualization skills and various statistical and graphical approaches for mapping and visualization techniques.