# Master of Science in Geospatial Information Sciences

http://www.gis.utdallas.edu

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Students may choose between two tracks within the Master of Science in Geospatial Information Sciences program.  Both tracks are offered jointly by the School of Economic, Political and Policy Sciences and the School of Natural Sciences and Mathematics. The first track is a professional program that focuses on the use of Geographic Information Systems (GIS) and associated technologies such as remote sensing and global positioning systems for acquiring, managing, analyzing and communicating spatially-referenced information. This program emphasizes coursework, and involves a capstone class where, under the supervision of a faculty member, students prepare and present to the faculty and fellow students a professional GIS project. Students are expected to master the concepts underlying GIS, the skills for implementing GIS projects in public or private sector organizations, and the ability to use GIS in pure or applied research in substantive areas. Graduates can apply their skills in a variety of areas such as public administration and policy analysis; public safety, criminology,  emergency preparedness management; environmental management; urban, regional, social service and transportation planning and analysis;  marketing, site selection, logistics and real estate; and resource exploration, including petroleum.

The second track of the Master's of Science in Geospatial Information Sciences program is a conventional program that offers a balance between coursework and research, and ultimately leads a student to produce a research-oriented master's thesis.  This track is aimed at students who want to hone their research skills, and is the preferred route for students who may want to move to a doctoral program. Graduates can apply their skills to the same areas as graduates from the first track, but also have the option of moving into research-oriented jobs, and maximizing their ability to move into doctoral programs.

## Mission and Objectives

The mission of both tracks the Master of Science in Geographic Information Sciences program is to provide students a rigorous understanding of the technologies, quantitative techniques, models and theories used to acquire and manage spatially referenced information, analyze spatial processes, and communicate spatial information.  The second track has the additional mission of providing students with a thorough understanding of the scientific research method.  U.T.Dallas graduates will have strong analytical and numerical skills, knowledge of empirical and quantitative research methodologies, and employ novel geographic information sciences technologies. They will use these capabilities to support public and private sector organizations, to address significant societal issues, and to enhance understanding of the human and natural environments. They will successfully compete at the highest level for jobs requiring geospatial skills and for entry into quality doctoral programs in relevant areas. More specifically, graduates of the program will:

- demonstrate their knowledge of the technologies, quantitative techniques, models and theories used to acquire and manage spatially referenced information and to analyze spatial processes.

- have strong analytical and numerical skills, knowledge of empirical and quantitative research methodologies, and be able to employ these skills and methodologies in novel geographic information sciences applications.

- be able to identify and apply appropriate geospatial methodologies to support public and private sector organizations, to address significant societal issues, and to enhance understanding of the human and natural environments.

## Facilities

Classes are offered through state-of-the-art GIS computing facilities housed in the School of Economic, Political and Policy Sciences and the NASA Center for Excellence in Remote Sensing in the Department of Geosciences. The University's extensive instructional computing facilities are also available. Facilities are open extended hours including evenings and weekends. Enrollment in hands-on courses is controlled to ensure that a computer workstation is available for every student. All industry-standard GIS and remote sensing software is available. The University is a an Oracle Center of Excellence for Spatial Data Management and a member of the University Consortium for Geographic Information Science (UCGIS)

## Admission Requirements

The University's general admission requirements are discussed here.

For admission to the program, a baccalaureate degree from an accredited university or college is required and Graduate Record Examination (GRE) or Graduate Management Aptitude Test (GMAT) scores must be presented. A 3.0 undergraduate grade point average (on a 4.0 scale), and a combined verbal and quantitative score of at least 1000 on the GRE, or equivalent score on the GMAT, are desirable. Students must also submit transcripts from all higher education institutions attended, three letters of recommendation, and a personal statement, approximately one page in length, outlining their background, education and professional objectives.

## Prerequisites

Beginning students must have the equivalent of GISC 6381 Geographic Information Systems Fundamentals and GISC 6382 Applied Geographic Information Systems, or they must take these courses at UT Dallas in addition to the 30 credit hours required for the Masters. Additionally, beginning students are expected to have at least one course at the graduate or undergraduate level covering descriptive and inferential statistics (or take EPPS 6313 Descriptive and Inferential Statistics, but this will not count toward the 30 hours needed for the degree), to have completed college mathematics through calculus, and to have at least one programming or computer applications course or possess equivalent knowledge.

## Degree Requirements

The University's general degree requirements are discussed here.

To earn the Master of Science in Geospatial Information Sciences, students must complete a minimum of 30 semester credit hours of work beyond the prerequisites mentioned above. Both tracks of the program involve a base requirement of 9 hours (three courses), a core requirement of 9 hours, and prescribed electives for 9 hours.  The two tracks differ in their research requirements. Students must achieve at least a 3.0 grade point average in the core requirement and an overall grade point average of 3.0 to graduate.

## Base Requirement – Both Tracks (9 credit hours):

Statistics  (1 or 2 courses):

GISC 6301Geospatial Data Analysis Fundamentals or
GEOS 6313 Data Analysis for Geoscientists or
GISC 6311/ECON 6311 Statistics for Geospatial Scientists
GISC 7310 Regression with Spatial Applications or

Programming  (1 or 2 courses):

GEOS 6303 Computing for Geoscientists
GISC 6317 Computer Programming for GIS
GISC 6388 GIS  Application Software Development
GISC 7363 Internet Mapping and Information Processing

MIS 6326 Database Management Systems

## Core Requirement – Both Tracks (9 credit hours):

Students must earn a minimum grade point average (GPA) of 3.0 in at least three of the following courses:

GISC 6325 (GEOS 7365) Introduction to Remote Sensing
GISC 6384 Spatial Analysis and Modeling
GISC 6387 Geographic Information Systems Workshop
GEOS 7327/GISC 7367 Remote Sensing Workshop

## Elective Courses (at least 9 credit hours from the following, not duplicated elsewhere)

CS 6359 Object Oriented Analysis and Design
CS 6360 Database Design
CS 6366 Computer Graphics
CS 6384 Computer Vision
EPPS 7368 Spatial Epidemiology
GEOS 7322 Global Positioning System (GPS) Satellite Surveying Techniques
GEOS 7324 3-D Data Capture and Ground Lidar
GISC 6325 (GEOS 6325) Introduction to Remote Sensing

GISC 6380 Spatial Concepts and Organization
GISC 6383 GIS Management and Implementation
GISC 6385 GIS Theories, Models, and Issues

GISC 6388 GIS Application Development
GISC 7310 Regression Analysis with Spatial Applications
GISC 7360 GIS Pattern Analysis
GISC 7361 Spatial Statistics

GISC 7363 Internet Mapping and Information Processing
GISC 7364 Demographic Analysis and Modeling
GISC 7365 Remote Sensing Digital Image Processing
GISC 7366 Applied Remote Sensing
GISC 7387 GIS Research Design

GISC 8320  Seminar in Spatial Analysis

MIS 6308 Systems Analysis and Project Management
MIS 6324 Decision Support Systems
MIS 6326 Database Management Systems
MIS 6328 Information Strategy Planning
PA 6318 Information Systems in Policy Environments
EPPS 6316 Advanced Regression Analysis

**Research Project Requirement – Track One (3 hours):**

GISC 6389 GIS Master's Project

**Research Project Requirement – Track Two (3 hours):**

GISC 8V98 Master's Thesis