

School of Economic, Political and Policy Sciences

Geospatial Information Sciences (BS)

Geospatial Information Science (or GIScience) is the study of relationships between phenomena in space and time. In recent years, powerful new technologies and techniques have emerged that greatly improve our ability to acquire, archive, analyze and communicate information regarding people, places and other things on or near the Earth's surface. These same technologies and techniques allow us to combine this information into multi-tiered databases describing the physical, social and other aspects of all or portions of the Earth. Such databases can then be analyzed in novel ways that take the data's explicit spatial (or locational) nature into account. The insights produced by analyzing these types of databases are revolutionizing many fields of science, government, and business. Currently, commonplace consumer products such as web-based mapping systems and GPS units that incorporate locational information are directly impacting the everyday lives of ordinary individuals.

Graduates of the Bachelors of Science in Geospatial Information Science program will understand the logical, mathematical, and technological foundations for compiling and analyzing spatial data. They will be skilled in solving geospatial problems, enabling them to move into professional roles handling the geospatial needs of typical corporate, government, and nonprofit organizations. The graduates will not only be skilled in the use of common GIScience software systems, but also will understand the underlying principles upon which software systems are based. This will allow them to transfer their knowledge from one software system to another, to expand the capabilities of these systems, and most importantly, to view geospatial problems as issues that can be solved by applying basic theories, techniques and methodologies.

Mission and Objectives

The mission of the Bachelor of Science in Geospatial Information Sciences program is to provide students with a rigorous understanding of the fundamental theories and concepts underlying GIScience, as well as to provide them with extensive hands-on experience with contemporary GIScience hardware and software. The goal of the program is to give students a firm grasp of the theories, ideas, and techniques that underlay software and hardware systems for the compilation and analysis of spatially referenced data, and thus provide them with a foundation of knowledge and skill that transcends any individual piece of software or hardware. Graduates of this program will be able to successfully compete for professional positions within GIScience and related fields, and be admitted into the best graduate schools globally.

Students within the program will:

- Demonstrate their understanding of the underlying theories, ideas, concepts and techniques of

GIScience.

- Master contemporary computer hardware and software systems commonly employed in GIScience.
- Demonstrate problem solving skills that employ their understanding of theories, ideas and concepts as well as their mastery of GIScience software and hardware.

Bachelor of Science in Geospatial Information Sciences

Degree Requirements (120 hours)

I. Core Curriculum Requirements: 42 hours¹

Communication (6 hours)

3 hours Communication ([RHET 1302](#))

3 hours Communication Elective ([GEOG 3377](#))

Social and Behavioral Sciences (15 hours)

6 semester credit hours Government ([GOVT 2301](#) and [GOVT 2302](#))

6 hours American History ([HIST 1301](#) and [HIST 1302](#))

3 hours Social and Behavioral Sciences Elective ([SOC 1301](#), [SOC 2319](#), [CRIM 1301](#), or [CRIM 1307](#))

Humanities and Fine Arts (6 hours)

3 hours Fine Arts ([ARTS 1301](#))

3 hours Humanities ([HUMA 1301](#))

Mathematics and Quantitative Reasoning (6 hours)

3 hours Mathematics ([MATH 1325](#), [MATH 2413](#) or [MATH 2417](#))²

3-4 hours Quantitative Reasoning ([EPPS 3405](#))²

Science (9 hours)

[GEOS 1103](#) Physical Geology Laboratory

[GEOS 1303](#) Physical Geology

5 credit hours Science elective(s)

II. Major Requirements: 44 hours

Major Preparatory Courses (11 hours beyond Core Curriculum)

[EPPS 3405](#) Introduction to Social Statistics with Lab^{2, 3}

[MATH 1325](#) Applied Calculus I^{2, 3}

or [MATH 2413](#) Differential Calculus^{2, 3}

or [MATH 2417](#) Calculus I^{2, 3}

[ENVR 2302](#) or [GEOG 2302](#) or [GEOS 2302](#) The Global Environment

[GEOG 2303](#) People and Place: An Introduction to World Geographic Regions

[GEOG 3370](#) The Global Economy

Major Core Courses (18 hours)

[GEOG 3304](#) or [GISC 3304](#) or [GEOS 3304](#) Tools for Spatial Analysis

[GEOG 4380](#) Spatial Concepts and Organization

[GISC 2301](#) or [GEOS 2301](#) Introduction to Geospatial Information Science

[GISC 2302](#) Geodesy and Geospatial Analysis

[GISC 4325](#) or [GEOS 4325](#) Introduction to Remote Sensing

[GISC 4382](#) Applied Geographic Information Systems

Concentrations (15 hours in ONE of the following concentration areas)

Geography

[GEOG 3331](#) Urban Growth and Structure

[GEOG 3357](#) Spatial Dimensions of Health and Disease⁴

[GEOG 3359](#) Human Migration and Mobility⁴

[GEOG 3372](#) Population and Development

[GEOG 3382](#) Russia: Yesterday, Today and Tomorrow⁴

GeoComputation and GeoVisualization

[MIS 3300](#) Introduction to Management Information Systems

[GISC 4317](#) GeoComputation

[GISC 4326](#) Cartography and GeoVisualization

[GISC 4384](#) Urban and Environmental GIS

[GISC 4385](#) Advances in GIS

III. Elective Requirements: 34 hours

Prescribed Electives (15 hours)

All students are required to take at least fifteen hours of prescribed upper-division elective courses.

Free Electives (19 hours)

This requirement may be satisfied with lower- and upper-division courses from any field of study. Students must complete at least 51 hours of upper-division courses to qualify for graduation.

Minor in Geography

This minor will provide students from all majors with a better understanding of distribution issues and the skills to analyze current and evolving spatial problems at various scale levels from local to global. Students are encouraged to learn to view spatial issues from scientific, environmental, political, and social standpoints. The 18-hour Geography Minor enables UT Dallas students to develop expertise in this important area.

Students are expected to take the following classes to meet the requirements:

[ENVR 2302](#) or [GEOG 2302](#) or [GEOS 2302](#) The Global Environment

[GEOG 2303](#) People and Place: An Introduction to World Geographic Regions

[GEOG 3370](#) The Global Economy

The remaining 9 credit hours must all be upper-division GEOG or GISC courses.

Student may also contact their academic advisor for a list of the courses that satisfy the minor requirements. No credit hours may be used to satisfy both major and minor requirements.

Because Geography is concerned with a distribution and interrelationships analysis, it provides a strong foundation for all careers that deal with spatial data. All social sciences study relationships on some level: prices and quantities, political parties and campaign contributions, musical genres and cultural diversity, etc. Students considering careers in business, education, law, public health,

urban development, environmental studies, or government work can benefit from minoring in Geography.

Upon completion of the Minor Program, students will:

- Have a comprehensive general education background
- Have a working knowledge of spatial principles and tools
- Understand the societal and environmental issues that may impede the adoption of geographic information systems across various fields of application
- Have the ability to communicate effectively and work collaboratively
- Be able to become successful professionals and, if they desire, be able to pursue graduate study

1. Curriculum Requirements can be fulfilled by other approved courses from accredited institutions of higher education. The courses listed in parentheses are recommended as the most efficient way to satisfy both Core Curriculum and Major Requirements at UT Dallas.

2. Three hours are counted under Mathematics and/or Quantitative Reasoning core, and one hour is counted under Major Preparatory Courses.

3. A Major requirement that also fulfills a Core Curriculum requirement. Hours are counted in Core Curriculum.

4. Alternative courses, as approved by the department head, may be used to satisfy this requirement.

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