GEOGRAPHIC INFORMATION SCIENCE AND TECHNOLOGY - BS, COMPUTATION, DESIGN AND ANALYSIS TRACK

The BS in Geographic Information Science and Technology (GIST) requires semester credit hours for completion in the Computation, Design, and Analysis (CDA), Earth Systems Analysis (ESA), or the Human Systems and Society (HSS) tracks.

The Computation, Design, and Analysis (CDA) track is intended for students interested in the computational, analysis, and software development aspects of GIST. This track emphasizes the computational and information technology that underpins GIST and focuses on technical issues, algorithm development and performance, and software tool development.

Students will receive a rigorous and modern-day education and training in GIST with application knowledge in physical and human geography. Employers require problem solvers, not button pushers, to address problems in various application domains. The BS in GIST is designed to:

- Provide modern-day exposure to the rapidly changing field of GIST
- Balance education and training with a focus on competency
- Provide application and problem-solving experiences
- Support student activities and research
- Provide students with professional experience
- Produce high-quality geographers with strong GIST knowledge and skills

Geospatial technology graduates are in extremely high demand and according to the US Department of Labor (USDL), are one of the highest growth areas in the federal government, particularly in homeland security activities, as well as in energy, software and engineering firms, and biomedical and biohazard research, among many others. A 35% annual rate of growth in Geospatial Technology related degrees are projected by the United States Department of Labor. Specifically, students have employment opportunities with the following corporate and government entities:

- Government agencies (federal, state, county, and city): management and planning of urban infrastructure, inventory and assessment of natural resources including agriculture, forestry, and water resources.
- Energy industry: assessing biofuel production and identifying locations suitable for renewable energy resources and mineral exploration.
- Health science industry: determine hotspots of health events and explore causative influences.
- Military and intelligence community: numerous opportunities exist in military branches, and agencies such as the Central Intelligence Agency, National Security Agency, and other intelligence organizations.
- Commercial industries: business analytics and marketing, as spatial information can be used to target marketing campaigns, and suitable site assessment to locate companies.
- Geospatial industries: software development, geotechnical engineering, and technology development.

Students select courses with the assistance of faculty advisors and academic advisor in an individualized advising system.

Program Requirements

First Year

<table>
<thead>
<tr>
<th>Semester Credit Hours</th>
<th>Fall</th>
<th>Spring</th>
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<tbody>
<tr>
<td>14</td>
<td></td>
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<tr>
<td>3</td>
<td>GEOG 203</td>
<td>Planet Earth</td>
</tr>
<tr>
<td>3</td>
<td>GEOG 213</td>
<td>Planet Earth Lab</td>
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<tr>
<td>3</td>
<td>MATH 141</td>
<td>Finite Mathematics</td>
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<tr>
<td>3</td>
<td>Life and physical sciences 1</td>
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<tr>
<td>4</td>
<td>Select one from the following:</td>
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<tr>
<td></td>
<td>BIOL 101</td>
<td>Botany</td>
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<td></td>
<td>BIOL 111</td>
<td>Introductory Biology I</td>
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<td></td>
<td>CHEM 101  &amp; CHEM 111</td>
<td>Fundamentals of Chemistry I &amp; Fundamentals of Chemistry Laboratory I</td>
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<td></td>
<td>GEOL 101</td>
<td>Principles of Geology</td>
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<td></td>
<td>PHYS 201</td>
<td>College Physics</td>
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<td>ATMO 201</td>
<td>Weather and Climate and Weather and Climate Laboratory</td>
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<tr>
<td>Semester Credit Hours</td>
<td>14</td>
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Second Year

<table>
<thead>
<tr>
<th>Semester Credit Hours</th>
<th>Fall</th>
<th>Spring</th>
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<tbody>
<tr>
<td>16</td>
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<tr>
<td>3</td>
<td>GEG 232</td>
<td>Cartography and Visualization</td>
</tr>
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<td>4</td>
<td>Select one of the following:</td>
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<tr>
<td></td>
<td>CSCE 110</td>
<td>Programming I</td>
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<tr>
<td></td>
<td>CSCE 111</td>
<td>Introduction to Computer Science Concepts and Programming</td>
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</tbody>
</table>

1. Life and physical sciences include courses in biology, chemistry, geology, physics, and oceanography.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>POLS 207</td>
<td>State and Local Government</td>
<td>3</td>
</tr>
<tr>
<td>American history</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Social and behavioral sciences</td>
<td>3</td>
<td></td>
</tr>
</tbody>
</table>

**American history** ([http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#american-history](http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#american-history)) 3

**Social and behavioral sciences** ([http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#social-behavioral-sciences](http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#social-behavioral-sciences)) 3

**Semester Credit Hours** 16

**Spring**

**Physical Geography** 3

Select one of the following:

- GEOG 324 Global Climatic Regions
- GEOG 331 Geomorphology
- GEOG 335 Pattern and Process in Biogeography
- GEOG 352/GEOL 352 GNSS in the Geosciences
- STAT 303 Statistical Methods

**American history** ([http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#american-history](http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#american-history)) 3

**Language, philosophy and culture** ([http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#language-philosophy-culture](http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#language-philosophy-culture)) 3

**Semester Credit Hours** 15

**Third Year**

**Fall**

- GEOG 361 Remote Sensing in Geosciences 4
- GEOG 390 Principles of Geographic Information Systems 4
- GEOG 392 GIS Programming 4
- Creative arts ([http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#creative-arts](http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#creative-arts)) 3

**Semester Credit Hours** 15

**Spring**

- ESSM 459 Programming for Spatial Data Applications or Geodatabases 3
- GEOG 312 Data Analysis in Geography 3
- GEOG 475 Advanced Topics in GIS (Geographic Information Systems) 4
- Directed elective 4

**Directed elective** 2

**Semester Credit Hours** 14

**Fourth Year**

**Fall**

- Human Geography 3

Select one of the following:

- GEOG 304 Economic Geography
- GEOG 306 Introduction to Urban Geography
- GEOG 311 Cultural Geography
- Directed elective 6

**Track elective** 2

**Directed elective** 6

Select from the following:

- GEOG 306 Introduction to Urban Geography
- GEOG 309 Geography of Energy

- GEOG 330 Resources and the Environment
- GEOG 335 Pattern and Process in Biogeography
- GEOG 370/MARS 370 Coastal Processes
- GEOG 398 Interpretation of Aerial Photographs
- GEOG 404 Spatial Thinking, Perception and Behavior
- GEOG 450 Field Geography
- GEOG 461 Digital Image Processing in the Geosciences
- GEOG 467 Dynamic Modeling of Earth and Environmental Systems
- GEOG 477 Terrain Analysis and Mapping
- GEOG 479 Principles of Geocomputation

**Semester Credit Hours** 15

**Spring**

- GEOG 476 GIS Practicum 3
- GEOG 478 WebGIS 4
- Directed elective 8

**Directed elective** 2

**Semester Credit Hours** 15

**Total Semester Credit Hours** 120

1 Department requires that you take two in the same discipline to meet this requirement.


3 Track electives comprise 6 hours of focused coursework. The track and specific courses within the track are to be chosen in consultation with the advisor and/or faculty mentor. Two courses in the degree plan must be Writing Intensive courses designated by the department in the schedule of classes. Also, International and Cultural Diversity Electives (6 hours) must be incorporated into the degree.