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>Fall</th>
<th>Semester Credit Hours</th>
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<tbody>
<tr>
<td>Communication (<a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#communication">http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#communication</a>)</td>
<td>3</td>
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<tr>
<td>GEOG 203 Planet Earth</td>
<td>3</td>
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<tr>
<td>GEOG 213 Planet Earth Lab</td>
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<tr>
<td>MATH 141 Finite Mathematics</td>
<td>3</td>
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<td>Life and physical sciences</td>
<td>4</td>
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<td>Select one from the following:</td>
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<tr>
<td>BIOL 101 Botany</td>
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<td>BIOL 111 Introductory Biology I</td>
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<tr>
<td>CHEM 101 &amp; CHEM 111 Fundamentals of Chemistry I and Fundamentals of Chemistry Laboratory I</td>
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<td>GEOL 101 Principles of Geology</td>
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<td>PHYS 201 College Physics</td>
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<tr>
<td>ATMO 201 &amp; ATMO 202 Weather and Climate and Weather and Climate Laboratory</td>
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<thead>
<tr>
<th>Spring</th>
<th>Semester Credit Hours</th>
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<tbody>
<tr>
<td>GEOG 201 Introduction to Human Geography</td>
<td>3</td>
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<tr>
<td>MATH 142 Business Calculus</td>
<td>3</td>
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<tr>
<td>POLS 206 American National Government</td>
<td>3</td>
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<tr>
<td>Communication (<a href="http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#communication">http://catalog.tamu.edu/undergraduate/general-information/university-core-curriculum/#communication</a>)</td>
<td>3</td>
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<tr>
<td>Life and physical sciences</td>
<td>4</td>
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<td>Select one of the following:</td>
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<td>BIOL 107 Zoology</td>
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<td>BIOL 112 Introductory Biology II</td>
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<tr>
<td>CHEM 102 &amp; CHEM 112 Fundamentals of Chemistry II and Fundamentals of Chemistry Laboratory II</td>
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<td>GEOL 106 Historical Geology</td>
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<td>PHYS 202 College Physics</td>
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<tr>
<td>OCGN 251 &amp; OCGN 252 Oceanography and Oceanography Laboratory</td>
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Second Year

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<tr>
<th>Fall</th>
<th>Semester Credit Hours</th>
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<tr>
<td>GEOG 232 Cartography and Visualization</td>
<td>3</td>
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<tr>
<td>Select one of the following:</td>
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<tr>
<td>CSCE 110 Programming I</td>
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<tr>
<td>CSCE 111 Introduction to Computer Science Concepts and Programming</td>
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</table>
POLS 207  State and Local Government  3

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)  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)  3

Language, philosophy and 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)  3

Semester Credit Hours  15

Spring
- ESM 459  or GEOG 391  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  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  2
- Track elective  3

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  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.