

GEOSPATIAL TECHNOLOGY

GIST 131 Introduction to GIS and GPS 3 Credit Hours (2,3)

This course develops foundational knowledge and skills in (1) cartography (the science and art of map making); (2) remote sensing; (3) geographic information systems (GIS) and the many applications of GIS in diverse professional and academic fields; and (4) the theory and operation of GPS receivers and data integration with GIS.

Prerequisite(s): None

GIST 225 Intermediate GIS 3 Credit Hours (2,3)

This course includes design, implementation, and use of geographic information systems (GIS) for a variety of practical applications and research topics. Emphasis will be on geodatabases, georeferencing, geocoding, and geoprocessing, as well as providing an introduction to advanced topics using ESRI's suite of geospatial applications.

Prerequisite(s): GIST131

GIST 325 Geospatial Analysis 3 Credit Hours (2,3)

This course utilizes visualization of spatial data with GIS-based methods to analyze the data's distribution in space and/or time. Key topics will include the properties and quality of spatial data from land based and remote sensing sources, and the conceptual framework of spatial analysis. Project-centric lab exercises will include a variety of geospatial application such as the analysis of land use/land cover change, digital elevation model (DEM) analysis for terrain, watershed and flow, spatial interpolation, site suitability analysis, and spatial modeling through public and/or private sector applications.

Prerequisite(s): GIST225

GIST 355 GeoAI & Python for Spat Data 4 Credit Hours (3,3)

This course leverages the versatility of Python scripting and power of GeoAI for converting and managing geographic data, automating spatial analysis workflows and building models to solve complex problems quickly. The focus lies in automating routine GIS operations and building custom tools through Python scripts and applying spatial machine learning and deep learning techniques using pre-trained models through GeoAI. It will further emphasize the use of AI assistants to make spatial analysis more efficient through quick extraction of geospatial information from large geospatial data sets.

Prerequisite(s): GIST225 and CSCI105 or by permission of instructor

GIST 365 App Geospatial Technologies 4 Credit Hours (3,3)

This course focuses on contemporary and emerging trends in field-based geospatial technologies such as using unmanned aerial vehicles (e.g. drones), land survey equipment, and advanced GPS for data collection. Course content will evolve to reflect the current state of technologies in geospatial data acquisition, processing, and delivery.

Prerequisite(s): GIST225

GIST 445 Remote Sensing & Spatial Stats 4 Credit Hours (3,3)

Remote sensing skills such as ortho-rectification, color balancing, tiling imagery, and automatic feature recognition will be used to analyze spatial data such as aerial photography, hyperspectral imagery, multi-spectral imagery, LiDAR, microwave, and RADAR. Spatial statistics focuses on analyzing patterns, mapping clusters, and identifying geographic distributions using point pattern analysis spatial autocorrelation, spatial regression and kriging.

Prerequisite(s): GIST225

GIST 545 Remote Sensing & Spatial Stats 4 Credit Hours (3,3)

Remote sensing skills such as ortho-rectification, color balancing, tiling imagery, and automate feature recognition will be used to analyze spatial data such as aerial photography, hyperspectral imagery, multi-spectral imagery, LiDaR, microwave, and RADAR. Spatial statistics focuses on analyzing patterns, mapping clusters, and identifying geographic distributions using point pattern analysis, spatial autocorrelation, spatial regression and kriging.

Prerequisite(s): GIST225 or permission of instructor; accepted into graduate program