GEOGRAPHIC INFORMATION SYSTEMS (GIS)

NOTE: Prior to Fall 2020, these courses were offered under the subject code GISC.

GIS 125 Mapping and Spatial Thinking
(3 Credits, Fall)
This course provides students with an overview of spatial thinking fundamentals and introduces geospatial technology as a means for illustrating these concepts. Spatial thinking is a set of cognitive skills used in identifying and understanding the location, scale, patterns, and trends of geographic relationships. Students will have hands-on experience working with these concepts in exercises with applications in the social and natural sciences. This course is of value not only to Geography majors but to all students interested in applying spatial thinking to their major field. (3 lecture hours, 0 lab hours, 3 credits)

GIS 126 Fundamentals of GIS
(3 Credits, Fall)
This course provides an introduction to the basic concepts and uses of geographic information systems (GIS). The course introduces the student to the theory and techniques of GIS, including the history of GIS, spatial data models, spatial and tabular data acquisition, spatial data management, spatial data analysis, and cartographic design and display. Emphasis in lab is placed on the hands-on use of ESRI ArcGIS Desktop software and includes exercises that allow the student to develop skills such as building, editing, and querying a GIS database; spatial data acquisition, including digitizing and data capture; projecting data; basic spatial analysis; displaying spatial data using basic cartographic principles to create maps; and creating metadata. For the final project, students identify a spatial problem, then design and implement an analysis to address the problem. (3 lecture hours, 0 lab hours, 3 credits)

GIS 155 Introduction to GPS
(2 Credits, Fall)
This course provides a survey of basic mapping concepts and global positioning systems (GPS). Topics include modeling the Earth’s surface, topographic maps, aerial photo interpretation, thematic maps, basics of GPS hardware, GPS theory and function, GPS data collection and organization, differential GPS data correction, and importing and manipulating GPS data in a user-friendly GIS application (ArcGIS for Desktop and/or ArcGIS Online). (2 lecture hours, 0 lab hours, 2 credits)

GIS 220 Cartography
(3 Credits, Fall)
This course provides an introduction to map design and production in the context of Geographic Information Systems (GIS). Emphasis is on the concepts and methods associated with designing and producing thematic maps. Topics include data standardization and classification, symbolization, map projections, map elements, typography, cartographic design, thematic mapping techniques, color, and history of cartography. The course will also help students develop their ability to critically evaluate maps for effective design. PREREQ: GIS 126. (3 lecture hours, 0 lab hours, 3 credits)

GIS 226 Spatial Analysis With GIS
(3 Credits, Spring)
This course builds on spatial analysis principles and concepts of GIS 126. Methods for analyzing environmental and social-spatial data sets will be utilized. Topics include point pattern analysis, spatial clustering methods, spatial autocorrelation, and kriging. Students will focus on more complex spatial analysis, and gain hands-on experience in advanced querying operations, Spatial Analyst, Raster Analysis, Network Analyst, ArcGIS ModelBuilder, database management, and the application of ArcGIS in a variety of disciplines. PREREQ: GIS 126. (3 lecture hours, 0 lab hours, 3 credits)

GIS 230 Remote Sensing/GIS Integration
(3 Credits, Spring)
This course will provide an overview of the principles of remote sensing and image processing. Students will learn about satellite imagery and aerial photography as data sources for geographic information systems, along with image enhancement, classification techniques, and spatial relationships. PREREQ: GIS 126. (3 lecture hours, 0 lab hours, 3 credits)

GIS 240 Python Scripting for GIS
(3 Credits, Fall)
Python is the scripting language of choice for the ArcGIS platform. This course introduces fundamental Python concepts and the Python scripting environment in ArcGIS. Students will learn to write Python script to automate routine tasks, customize data processing, create a tool with GIS applications in mind, and export models to Python using the ArcGIS ModelBuilder. Students do not need any prior programming experience. PREREQ: GIS 126 and GIS 226. (3 lecture hours, 0 lab hours, 3 credits)