GEOGRAPHIC INFORMATION SYSTEMS (GIS)

GIS 120 Web GIS
(3 Credits, Fall)
Gain hands-on experience learning the fundamental knowledge and skills needed to build modern web GIS applications and manage web GIS projects using the latest geospatial cloud technologies. This course focuses on the Esri Geospatial Cloud, the most widely used GIS platform in government and non-governmental organizations. Technologies taught include cloud GIS (ArcGIS Online and ArcGIS Enterprise), browser-based web apps (ArcGIS web app templates, Story Maps, Web AppBuilder, and Operations Dashboard), mobile GIS apps (Collector, Survey123, AppStudio, and Workforce), 3D web scenes, imagery services, and spatial analysis. Students will gain valuable experience that can be applied in academic and professional fields. *(3 lecture hours, 0 lab hours, 3 credits)*

GIS 126 Fundamentals of GIS
(3 Credits, Fall/Spring)
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 225 Cartography
(4 Credits, Spring)
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. *(4 lecture hours, 0 lab hours, 4 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)*

Refer to How to Read Course Descriptions for an explanation of elements found in the course descriptions above.