

GEOGRAPHIC INFORMATION SYSTEMS (GIS)

GIS 501 Fundamentals of GIS (3 Credits)

GIS 502 Fundamentals of GIS (1 Credit)

Corequisite(s): GIS 501

GIS 505 Geovisualization & Cartography (3 Credits)

Communicating geographic concepts, problems and solutions are key to the geovisualization and spatial design, the modern art and science of cartography. The foundational principles of the course will be grounded in the fundamentals of traditional cartography using GIS in combination with design and analytical software. This course will immerse students in color theory, symbology, typography, along with 2-D and 3-D design layout within web and print media. Hands-on learning experiences will emphasize and apply scientific visualization techniques alongside the art of data visualization, both in terms of how to use visualization to understand spatial data and to create strong visual communication.

GIS 510 Introduction to Remote Sensing (3 Credits)

Remote sensing is the art and science of obtaining information about an object without being in direct physical contact. Students will develop a robust understanding of the tools and techniques used to display, process, and analyze remotely sensed data, while studying the theory, principles, and methodology of remote sensing of the environment for geospatial applications. Emphasis will be placed on designing, implementing, and critically evaluating the processes of image acquisition and data collection in the electromagnetic spectrum from a variety of sensors (i.e. aerial, satellite, multispectral, hyperspectral, and LiDAR) and analysis through data set manipulations. Upon completion of this course students will be able to develop analytical workflows to derive products and extract information from remotely sensed data for a broad range of applications.

GIS 511 Geospatial Pattern Analysis (1 Credit)

GIS 520 Advanced GIS (3 Credits)

This course extends the existing base of GIS knowledge and skills by amplifying programmatic approaches to spatial data and analysis. Lectures, labs, and projects emphasize GIS model development, develop spatial database architecture and design best practices, and extend knowledge of web GIS by authoring and consuming geographic web services. Students will become familiar with methods of leveraging programming languages (such as Python) to make GIS processing easier, faster, and more accurate by scripting and automating data management, production, manipulation, and analysis procedures. Activities develop GIS analysis skills with examples from government, social science, physical science, and the humanities.

Prerequisite(s): GIS 501

GIS 550 Res Geospatial Tech (1-3 Credits)

This course provides students the opportunity to create a project demonstrating an application of geospatial technologies such as GIS, Remote Sensing, GPS, and spatial analysis. Each student will design and apply practical research methodology for an original project. Projects should involve solving geospatial technology challenges, such as complex data collection, data management strategies, implementing new or experimental analysis techniques, or working with multiple stakeholders in an applied and/or academic setting. Identification of a faculty mentor and agreement on the format of deliverables is required prior to registration for this course. The course can be repeated for credit up to a maximum of 3 credits of GIS 480.

GIS 590 Topics: Geospatial Tech (1-3 Credits)

Selected topics related to geospatial technologies (GIS, GPS, Remote Sensing, etc.). These courses will be offered as advanced study of topics not routinely covered by existing courses or emerging topics in the field of geospatial technologies. Subjects, prerequisites and instructor will vary from semester to semester. If there is no duplication of topic, this course may be repeated for credit by students.