

GEOSPATIAL INFORMATION SCIENCE (GIS)

GIS-299 Special Projects: Geospatial Information Science 1-3 Unit (IS 16-54)

Students with previous course work in the program may do special projects that involve research and special study. The actual nature of the project must be determined in consultation with the supervising instructor.

Prerequisite: Two Geospatial Information Science classes must be completed prior to enrollment; a Special Projects contract must be completed with the instructor prior to enrollment.

GIS-520 Intermediate Geographic Information Science (formerly GEOG-520) 4 Units (LBE 48-54, LEC 48-54)

This course prepares students for more advanced geographic analysis using current professional GIS application software. This course enhances professional potential in a geospatial career. Advanced topics include geodatabase methods, topology, customized and automated processes, and cartographic representation. Legal and ethical issues, geospatial certification, professional presentation, online collaboration and networking at GIS events prepare students for entering a GIS profession in many discipline related fields. Exploration of scientific models and methods for advanced analysis prepare students for independently planning, implementing and producing a deliverable real-world GIS project. (formerly GEOG-520)

Prerequisite: GEOG-115 (with a grade of C or better).

GIS-525 Advanced Geographic Information Science (formerly GEOG-525) 3 Units (LBE 48-54, LEC 32-36)

This course prepares students for advanced geographic analysis. Spatial statistics, topology and surface modeling are emphasized. Advanced tools, techniques and software applications for modeling surfaces, such as spatial, network and 3-dimensional terrain analysis are explored. Both qualitative and quantitative techniques for spatial analysis are explored in the context of various scientific methodologies. (formerly GEOG-525)

Prerequisite: GIS-520 (with a grade of C or better).

GIS-540 Introduction to sUAS (Drone) Systems 3 Units (LBE 48-54, LEC 32-36)

This course introduces students to the basic operations of small, unmanned aircraft systems (sUAS), drone vehicles, for use in geospatial information science (GIS) applications. The course equips students with the basic drone flight skills and knowledge about the regulations and procedures governing the safe and legal operation of small, unmanned aircraft systems. The course prepares students to become commercial sUAS pilots and to take the Federal Aviation Administration's Part 107 airman knowledge test.

GIS-550 Introduction to sUAS (Drone) Systems Use in Remote Sensing 3 Units (LBE 48-54, LEC 32-36)

This course introduces students to a basic understanding of the use of sUAS (drones) for remote data collection. It includes presentations of remote sensing theory, and implementation using sUAS platforms, aerial drones, for digital data and imagery collection and the analysis of data for geospatial information science, GIS, applications. Topics include non-aerial, conventional aerial, and satellite imagery collection; however, the major emphasis of the course is imagery and data acquisition, image interpretation, and applications of sUAS (drone) collected imagery and digital data. Students develop skills using different types of sUAS equipped with remote sensing systems and software to produce and analyze remotely collected digital data.

Recommended Preparation: Some experience with sUAS (drone) piloting skills is recommended. These skills can be acquired in many ways other than formal training. Completion of GIS-540 (with a grade of C or better) or an FAA Part 107 License satisfies the recommended preparation but is not required.

GIS-551 Digital Imaging with sUAS (Drone) Systems I 3 Units (LBE 48-54, LEC 32-36)

This course introduces students to commercial uses of Small Unmanned Aerial Systems (sUAS), drone facilitated remote sensing theory and implementation. The course focuses on developing foundations for commercial applications of digital imagery used in geospatial information science (GIS). Topics include data acquisition, imagery collection, analysis, and interpretation.

Prerequisite: GIS-550 (with a grade of C or better), AND GEOG-115 (with a grade of C or better).

GIS-552 Digital Imaging with sUAS (Drone) Systems II 3 Units (LBE 48-54, LEC 32-36)

This course provides advanced instruction in Small Unmanned Aerial Systems (sUAS), drone facilitated remote sensing theory and implementation focusing on commercial applications of digital imagery used in geospatial information science (GIS). Topics include satellite imageries, data acquisition, and image interpretation. The hands-on applications of the course cover high resolution video, aerial imaging, intelligent mission planning, multi-spectrum image capture, and the use of sUAS, drones, for collection, editing, mapping and commercially related uses of remotely collected digital imagery.

Prerequisite: GIS-551 (with a grade of C or better).

GIS-580 Geospatial Information Systems Practicum I (formerly GEOG-080) 2 Units (LBE 72-81, LEC 8-9)

This course offers students an opportunity to access advanced practical geospatial information instruction on the use of GIS software and hardware, improve their conceptual and technical GIS skills, and work one-on-one with an instructor, instructional aide or GIS tutor. Although the GIS Practicum is recommended for students enrolled in GIS courses, students enrolled in related disciplines may also benefit from this lab course. (formerly GEOG-080)

GIS-582 Programming for GIS-Python Applications (formerly GEOG-582)
3 Units (LEC 48-54)

This course prepares students with the concepts necessary for technical application for programming within the framework of GIS. Topics include variable management, branching and looping, reading and writing from GIS tabular and spatial data, custom tool creation, and tool manipulation. Through practical applications, students will use programming methods to customize and streamline GIS data management and analysis. (formerly GEOG-582)

GIS-583 Spatial Database Design and Management (formerly GEOG-583)
3 Units (LEC 48-54)

This course prepares students with geographic concepts and skills necessary for GIS spatial database design and management. Students learn about various GIS data types and formats that are compatible or may be converted, exported or imported. Students design and create spatial databases for a specific application involving project management and complex data analysis. Real world challenges of spatial databases used for solving problems, spatial query language, decision support strategies and system integration are emphasized. (formerly GEOG-583)

GIS-584 Water Management with GIS (formerly GEOG-584)
3 Units (LEC 48-54)

This course enhances professional potential in the water industry. Water Science topics include hydrology concepts and common GIS applications. This course covers hydrology networks of rivers, streams, drainage basins, flooding, water utilities (surface, waste and drinking water utilities). Legal and ethical issues of water management are discussed. Professional certification, project collaboration and presentation, and networking at GIS events prepare students for entering a GIS profession in water-related industries. (formerly GEOG-584)

Recommended Preparation: GEOG-115.

GIS-585 GIS for Catastrophes (formerly GEOG-585)
3 Units (LEC 48-54)

This course provides students with an introduction to the use of GIS in emergency management, natural hazard assessment and public safety. Students learn about GIS applications to various types of emergency response, natural hazards and homeland security scenarios for which GIS is commonly used for making quick and critical decisions. Emphasis is placed on analytical techniques for mitigating disasters, allocating emergency resources, identifying hot spots for crime or analyzing potential homeland security threats. (formerly GEOG-585)

GIS-586 GIS for Web Applications (formerly GEOG-586)
3 Units (LEC 48-54)

This course prepares students with the geographic concepts and skills necessary for designing and developing geospatial content for web applications, internet interfaces and web environments. Students learn web based concepts, internet fundamentals, web architecture and practices as they design and create geospatial data for online data analysis, interactive mapping, and map publishing via web applications. Students use real world challenges and problem solving solutions for interoperability, customizing and sharing web services. (formerly GEOG-586)

Recommended Preparation: GEOG-115.