

GEOLOGY

- Certificate, Geographic Information Systems (p. 1)

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Certificate in Geographic Information Systems (GIS)

The GIS certificate program contains four courses at its core:

GEO 550	Applied Geographic Information Systems	4
GEO 555	Environmental Remote Sensing	4
GEO 560	Advanced Applications of Geographical Information Systems	3
GEO 598	GIS Capstone	3
Total Hours		14

Students may take 1 or 2 other courses relating to distinctive areas of concentration that they may choose. These courses can be existing UD courses that provide additional background knowledge to GIS usage, or GIS-specific courses that can be developed later with collaboration from other departments.

Courses

GEO 550. Applied Geographic Information Systems. 4 Hours

This course covers the fundamentals of Geographic Information Systems (GIS) technology and how it is being applied in such diverse fields as physical sciences, social/political sciences, planning, marketing, health, criminal justice, natural resources, and engineering. Students will learn the processes to collect, organize, analyze and display geographic data obtained from sources such as address geocoding, GPS, CD-ROM and World Wide Web sites. However, the emphasis of the course will be on data preparation and visualization based on sound knowledge of basic principles of cartographic design. Some preliminary data analysis techniques will be introduced but it is not an emphasis of the course. Each student will complete a series of mini projects that illustrate the typical steps in a GIS project. Major topics include: representation of geography, coordinate systems and map projections, principles of basic cartography, thematic mapping, data acquisition using GPS, geocoding, basic editing, and basic data management and exploration.

GEO 555. Environmental Remote Sensing. 4 Hours

Introduction to principles and concepts of Remote Sensing, a sophisticated technology of earth observation that provides fundamental data for global environmental investigation. Prerequisite(s): GEO 307 or Permission.

GEO 560. Advanced Applications of Geographical Information Systems. 3 Hours

Building upon GEO 450 / GEO 550, this course aims to broaden students' understanding of GIS theories and emphasize advanced spatial analysis, modeling and visualization methodologies. Based on an applied approach, this course will use a variety of projects to illustrate these techniques. Prerequisite(s): GEO 450 / GEO 550 Applied GIS.

GEO 585. Geographic Information Systems Applications in Water Resource Planning & Management. 4 Hours

This course introduces GIS applications in water resource management. Following an introduction to raster-based modeling in GIS, it will focus on GIS techniques in surface water modeling and floodplain delineation and management.

GEO 598. Capstone Project. 3 Hours

This capstone course aims to integrate concepts and capabilities developed in previous courses (GEO 450 / GEO 550 and GEO 560) and to apply them in a realistic setting relevant to individual student interests. The course seeks to refine skills in project implementation using GIS, emphasizing project development, organization and management, presentation technique, and the use of modern information-acquisition and processing technology in GIS and/or Remote Sensing. Prerequisite(s): GEO 450 / GEO 550 Applied GIS; GEO 560 Advanced GIS.