

GEOLOGY

- Certificate, Geographic Information Systems (p. 1)

Shuang-ye Wu, Department Chairperson
Umesh Haritashya, Graduate Program Director

Certificate in Geographic Information Systems (GIS)

The GIS certificate program contains four courses at its core:

GEO 550 or GEO 551	Applied Geographic Information Systems Geographic Information Systems (GIS) for Human Rights	4
GEO 555	Environmental Remote Sensing	4
GEO 560	Advanced Applications of Geographical Information Systems	3
GEO 598	Capstone Project	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 502. Glacial Geology. 3 Hours

The origin of mountain and continental glaciers; their depositional features, erosive activity and dynamics; history of glaciation in geologic past with special emphasis on North American Quaternary ice advances. Prerequisites: GEO 115 or GEO 109 or SCI 210 or GEO 208 or GEO 218.

GEO 502L. Glacial Geology Laboratory. 1 Hour

Course to accompany GEO 502. Three hours each week.

GEO 507. Sculpted Planet: Geomorphology, Surface Processes and the Origins of Earth's Topography. 3 Hours

Detailed study of the processes shaping the Earth's surface and the landforms and deposits they produce. This course is co-listed with GEO 407, and students taking this course will be given supplemental work and responsibilities, including additional or alternative exams, research and leadership roles during group projects. Prerequisites: GEO 115 or GEO 109 or SCI 210 or GEO 208 or GEO 218.

GEO 507L. Sculpted Planet Laboratory. 1 Hour

Course to accompany GEO 407. Three hours each week. This course is co-listed with GEO 407L, and students taking this course will be given supplemental work and responsibilities, including additional or alternative exams, research and leadership roles during group projects.

GEO 509. Advanced Surface & Groundwater Hydrology. 3 Hours

This course is designed to provide a graduate-level science or engineering student with the fundamental concepts and principles central to the study of water as a resource. This will include an examination of all components of the hydrologic cycle including surface-water hydrology and management, groundwater hydrogeology and water resource management. This course is co-listed with GEO 409, and students taking this course will be given extra assignments such as developing a report of groundwater flow analysis for an aquifer. Prerequisites: GEO 115 or SCI 210 or GEO 208 or GEO 109 or GEO 218 or permission of instructor.

GEO 509L. Advanced Surface and Groundwater Hydrology Laboratory. 1 Hour

Laboratory exercises to accompany GEO 409. Three hours per week. This course is co-listed with GEO 409L, and students taking this course will be given extra assignments.

GEO 510. Stratigraphy and Sedimentology. 3 Hours

Investigation and interpretation of sedimentary rocks, sedimentary environments and the stratigraphic record. This course is co-listed with GEO 410, and students taking this course will be given extra assignments during the semester and will be assignment a class project accompanied with an oral or poster presentation at the end of the semester. Prerequisites: GEO 109 or GEO 115 or GEO 208 or GEO 218 or equivalent.

GEO 510L. Stratigraphy and Sedimentology Laboratory. 1 Hour

Investigation and interpretation of sedimentary rocks, sedimentary environments and the stratigraphic record. This course is co-listed with GEO 410, and students taking this course will be given extra assignments during the semester and will be assignment a class project accompanied with oral or poster presentation at the end of the semester.

GEO 512. Introductory Geochemistry. 3 Hours

Study of elementary thermodynamics, aqueous geochemistry, and principles governing the distribution of trace elements, radioisotopes and stable isotopes in igneous, metamorphic and sedimentary rocks. Emphasis on applications and solution of geological problems. This course is co-listed with GEO 412, and students taking this course will be given extra assignments and article reading during the semester and will be assignment a class project accompanied with oral or poster presentation at the end of the semester. Prerequisites: GEO 201 or permission of instructor.

GEO 512L. Introductory Geochemistry Laboratory. 1 Hour

Course to accompany GEO 512 and co-listed with GEO 412 L. The class meet three hours a week. The lab extends the basic geochemical principles and concepts discussed in GEO 512 and provide hands on experience in the lab. The labs covers scientific methodology, analytical techniques, data analysis and interpretation, and applying geochemical principles to geological problems. In addition, the lab introduces geochemical softwares. Other skills you will learn are independent thinking and self-motivation.