

# GEOGRAPHY (GEOG)

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## Courses

**GEOG 5502 Environmental Remote Sensing and Digital Image Analysis Credits: 4**

This course will provide students with innovative techniques for landscape-level environmental analysis, geographic and geological studies, earth science research, and environmental resources management using remotely sensed data including satellite images. Students will be taught basic remote sensing concepts and technical skills, including energy radiative transfer processes, sensors and resolutions in remote sensing, computer-based image processing and classification, and remote sensing/GIS integration.

**Prerequisites:** GEOG 203, equivalent introductory GIS course, or permission of instructor

**GEOG 5503WI History and Philosophy of Geoscience Credits: 3**

A survey of geoscientific thought since antiquity. The substance of geography will be sought primarily in scholarly treatises, formal analytical systems, and cartography, but the course also addresses geographical principles emerging from the history of such matters as government, law economy, religion, and material culture. Readings, lectures, discussions, research, writing.

**GEOG 5504 Biogeography and Landscape Ecology Credits: 3**

Principles and applications of biogeography and landscape ecology, emphasizing distribution of major ecosystems and related plants and animal species on earth, biodiversity, landscape patterns and processes, and physical, biological, and human interactions. The course explores ecosystem and landscape analyses using advanced GIS, remote sensing, and spatial modeling methods for real problem solving in environmental and biological research, ecosystem conservation, and urban planning and studies.

**Prerequisites:** GEOG 203, GEOG 402 (or GEOG 5502).

**GEOG 5506 Global Environmental Change Credits: 3**

This course will examine the current rates of global environmental change and potential causes in the context of Earth's natural climate variability. The course will follow a seminar format. Students will read and discuss published articles on current and emerging theories of forcing mechanisms in the Earth's systems. Additional in-depth research and written evaluation are required for graduate credit.

**GEOG 5507 Advanced Geographic Information Science Credits: 4**

This course offers advanced topics and applications in geographic information systems, remote sensing, geospatial sciences, and environmental informatics. Classes are organized to encourage students to obtain critical thinking and practical knowledge of geographic information science by conducting research projects and presentations.

**Prerequisites:** GEOG 203, equivalent introductory GIS course, or permission of instructor

**GEOG 5509 Urban Geography Credits: 3**

Historical development, morphology and functions of urban places, including intercity relationships and the relationship between cities and their hinterlands; emphasis on American cities. Students will complete a series of reports and a term paper.

**GEOG 5510 Landscape, Language, Literature, and Law Credits: 3**

An examination of the geographic underpinnings and implications of languages, literatures, and jurisprudence. The course explores languages' historic rootedness in the interactions between human beings and their surroundings; the varying geographic expressiveness and discrimination of languages; the effect and significance of literary evocations of landscapes; and the cultural and environmental geographic content of the language of law. Readings, lectures, discussions, writing.

**GEOG 5512 Global Tourism Credits: 3**

This course is a regional survey of world tourism. Topics include the uniqueness of place, the marketing of tourist destinations, and the cultural, economic, and environmental impacts on host societies.

**Prerequisites:** GEOG 105 (or GEOG 200, or GEOG 202).

**GEOG 5526 Paleocology: Microfossils and Climate Change Credits: 3**

Paleocology will focus on questions addressing past environments and past climates based on the ecology of microfossils. Micro-organisms are very sensitive to a wide variety of environmental conditions including temperature, precipitation, hydrology, water chemistry, salinity, habitat, and pollution. The fossil remains of these organisms are used as proxy indicators for reconstructing past environmental conditions, climate change, vegetation dynamics, and human impacts. Students will have the opportunity to process microfossils and make interpretations based on analysis of data.

**GEOG 5530 Location Theory Credits: 3**

An analysis and evaluation of the basic theories that have been developed to account for the spatial arrangements of economic activity. Emphasis on urban areas as nodes of economic interaction. Three hours lecture and discussion per week.

**Prerequisites:** Six hours in economics or urban studies.

**GEOG 5537 Population Geography Credits: 3**

An analysis of human population: how they grow, their changing compositions, and how and why people migrate from one place to another. Basic demographic processes-mortality, fertility, and migrate- and theory and techniques for their study are discussed. The relationships between population growth and population planning, immigration, urbanization and cities, and the environment.

**GEOG 5544 Advanced Spatial Data Analysis Credits: 4**

This course will focus on advanced computation methods for the analysis and modeling of complex and often non-deterministic processes in the spatial and environmental sciences. Students will be introduced to innovative techniques for analyzing large datasets with attribute spaces of very high dimensionality, including hyper-spectral remote sensing data. Three hours lecture and one hour computer lab per week.

**Prerequisites:** GEOG 444, elementary statistics, or permission of instructor.

**GEOG 5546 Global Water and Sustainability Credits: 3**

This course examines the physical characteristics of water and its role in Earth systems. The challenges facing societies in an era of rapidly changing climate are explored.

**GEOG 5548 Satellite Climatology Credits: 4**

Use of satellite observations to study the climate system. Discussions consider the development of satellite climatology, sensors, platforms and methodologies use to estimate climate variables from radiance measurements. Aspects of climate that are emphasized include cloud climatologies, cloud systems, atmospheric moisture, radiation budget, and land-surface conditions. Three hours of lecture and one hour of lab per week.

**GEOG 5597 Graduate Seminar in Geosciences Credits: 3**

This graduate seminar examines emerging and current issues in Environmental and Urban Geosciences. Most environmental issues and their solutions are inherently multidisciplinary and are characterized by significant interactions between oceans, atmosphere, land, and society. In addition to examining these issues, this seminar engages students in the process of critically evaluating Earth and human systems studies. The course provides students with a fundamental background of today's important environmental challenges and experience doing the craft of science through critically reading, thinking, writing, and speaking.

**GEOG 5598 Special Topics in Geography Credits: 1-3**

Advanced independent research in Cultural or Physical Geography.

**Prerequisites:** Baccalaureate degree.

**GEOG 5598A Special Topics in Cultural Geography Credits: 1-3**

Advanced independent research in Cultural Geography.

**Prerequisites:** Baccalaureate degree.

**GEOG 5598B Special Topics in Physical Geography Credits: 1-3**

Advanced independent research in Physical Geography.

**Prerequisites:** Baccalaureate degree.

**GEOG 5598D Special Topics in Advanced GIS and Remote Sensing Credits: 1-3**

Advanced independent research in geographic information science (GIS) and remote sensing.

**GEOG 5598F Special Topics: Geostatistics and Modeling Credits: 1-3**

Advanced independent research in geostatistics and modeling techniques.

**GEOG 5599 Research and Thesis Geography Credits: 1-9**

Students will conduct research and writing in support of a thesis topic, which will have been approved in advance by the appropriate graduate advisory committee. Credit load will also be approved in advance by the student's graduate advisor.

**Prerequisites:** Baccalaureate degree.

**GEOG 5690 Special Research Topics Credits: 1-3**

Student will produce a major research paper suitable for publication under the direction of their instructor.

**GEOG 5699R Research And Dissertation Credits: 1-10**

Research for dissertation in partial fulfillment of the Geosciences requirements for the Ph.D. degree.