## Geography Courses (GEOG)

### Courses

**GEOG 1110. Global Geography — 3 hrs.**
Global geography is the study of people, places and the connections between them. How people give meaning and character to different places, and how the growing level of interdependence between those places shape and reshape the cultural, political, economic, and environmental nature of individual societies and global society as a whole. (Fall, Spring, Summer)

**GEOG 1120. Peoples, Cultures, and Environments — 3 hrs.**
Spatial perspectives on the dynamics of socio-cultural and human-environmental interactions, including processes, patterns, and systems examined from local to global scales of analysis. Through these perspectives, the course examines global human diversity and commonality via topics that include globalization, culture, population, sustainability and economies, while incorporating theories, findings, and works that illuminate the human condition. (Fall, Spring, Summer)

**GEOG 1210. Planet Earth — 3 hrs.**
We live in a swiftly changing world characterized by rapidly changing climates, shifting landscapes, growing human populations with degrading soil and water resources. Now, more than ever, it is essential to understand how Earth systems work, how they affect our livelihoods, and how we are altering them. The course has three objectives: 1) to provide a basic understanding of the most important processes shaping the Earth's physical systems; 2) to convince you of the dynamic nature of these systems, in part because of human activity; and 3) to help you understand the environmental systems of particular places so that you might use this background to explore these further and see how they change over time. Many students take this course to fulfill a LAC requirement. Others use it as a gateway to majors and careers in Geography, Natural Resources Management, and Environmental Science. (Fall, Spring, Summer)

**GEOG 1211. Planet Earth Laboratory — 1 hr.**
We live in a swiftly changing world characterized by rapidly changing climates, shifting landscapes, growing human populations with degrading soil and water resources. Now, more than ever, it is essential to understand how Earth systems work, how they affect our livelihoods, and how we are altering them. This laboratory course compliments and enhances students understanding of the content and scientific reasoning skills presented in GEOG 1210 thorough a series of applied laboratory activities. Prerequisite(s) or corequisite(s): GEOG 1210. (Fall and Spring)

**GEOG 1310. Digital Earth — 3 hrs.**
Survey of maps and map communication principles with a focus on digital maps and dynamic mapping applications. Emphasis on reading, analysis, and interpretation of information on maps. (Fall)

**GEOG 2120. North American Cities — 3 hrs.**
Principles of urban geography, including urban growth and change, structure and dynamics, and analysis and planning in North American cities. (Fall)

**GEOG 2210. Modern Climate Change: Evidence and Predictions — 3 hrs.**
Brief overview of the climate system. Examination of the evidence for recent global and regional climate changes. Analysis of the importance of greenhouse gases, solar changes, aerosols, and cloud changes as contributors to climate changes. (Fall)

**GEOG 2240. Natural Hazards and Disasters — 3 hrs.**
Examination of causes, physical processes, and geographic distribution of natural hazards. Discussion of prediction methods and social impact of such disasters. (Spring)

**GEOG 2250. Nature-Society Relations — 3 hrs.**
There is no relationship more fundamental to society than the one we have with our natural environment. This introductory course will explore human society's connection to food systems, climate change, urbanization and extinctions, while connecting local-scale phenomena with regional-, national-, and global-scale processes. (Spring)

**GEOG 2260. Environmental Resource Management — 3 hrs.**
This course provides an overview of issues and training in the accepted approaches to contemporary environmental management and sustainability, both in general and in the context of the state of Iowa. The objective of this course is to provide the theoretical background for critical analysis of resource management issues and applied problems in both for-profit and non-profit contexts, including but not limited to, government agencies, public park areas, public and private conservancies, and corporate environmental management contexts. Prerequisite(s): GEOG 1210 or EARTHSCI 1300; BIOL 2051; or consent of instructor. (Fall)

**GEOG 2270. Science of Scenery — 3 hrs.**
Exploring the core concepts of geomorphology and biogeography in the context of the landscapes of North American national parks and protected places. Prerequisite(s): GEOG 1210 or EARTHSCI 1300. (Odd Springs)

**GEOG 2320. Drones for Mapping and Communication — 3 hrs.**
This course will provide an overview of aspects related to unmanned aerial systems (UAS) operations for both environmental mapping and communication purposes. Topics will include: Basic aviation knowledge, current UAS regulations, flight control systems, UAS platforms/sensors, basic aerial mapping techniques, and aerial photography/videography for communications. Students will engage in classroom and field exercises and will gain hands-on experience with data collection using a variety of UAS. Field trips are required. (Fall)

**GEOG 2350. Intro to Environmental Data Analysis — 3 hrs.**
Scientific computing is becoming a core component of many earth and environmental sciences. This course focuses on the application scientific computing principles to analyze and visualize environmental data. Analysis tasks will range from basic data processing to full statistical analysis. For this course we will be using Python, a widely used, open source, general-purpose, and high-level programming language. It is easy to read and easy to learn. Python is increasingly being used for data analysis in scientific research for everything from basic statistics to complex computer models. No prior programming skills/experience are needed. (Even Springs)

**GEOG 2410. Geographic Information Systems I — 3 hrs.**
Fundamental concepts and operations of Geographic Information Systems with applications. Lectures are supplemented by computer-based projects. Lecture, 2 periods; lab 2 periods. (Fall and Spring)

**GEOG 2420. Cartographic Design — 3 hrs.**
Application of cartographic principles and techniques in compiling thematic maps. Emphasis on cartographic production including the use
of map projections, data characterization and symbolization, graphing, color use, typographic and design elements, and thematic mapping techniques. (Spring)

GEOG 2450. Regional Geography: (Variable Topic) — 3 hrs.
Study of geography of selected region including evolution and dynamics of its cultural, social, economic, political, and environmental dimensions. May be repeated on different regions. (Variable)

GEOG 3110. Economic Geography — 3 hrs.
Analysis of changing spatial structure of the economy and inter-relationships between geography and economics within a global perspective. (Odd Springs)

GEOG 3179. Cooperative Education in Geography — 1-3 hrs.
Practical experience in business, industry, or a government agency. May be repeated for maximum of 3 hours. Offered on credit/no credit basis only. Prerequisite(s): 15 hours of geography at UNI; cumulative GPA of 2.50; junior standing; consent of department. (Fall, Spring, Summer)

GEOG 3186. Studies in (Variable Topics).
Studies in (Variable Topics) (Variable)

Study of geographic dimension of human-environmental interaction. Historical perspectives on Earth's environmental problems, the place of humankind in ecological systems, and issues of sustainable development. May be repeated on different topics. Prerequisite(s): GEOG 1120 or GEOG 1210 or GEOG 2210 or GEOG 1110 or consent of instructor. (Variable)

Examination of physical basis of Remote Sensing and various sensing systems available for monitoring, mapping, measuring, and identifying phenomena on the earth's surface. Emphasis on non-photographic systems operating within the electromagnetic continuum. Various modes of multispectral scanning. Lecture, 2 periods; lab, 2 periods. (Fall)

GEOG 3410. Geographic Information Systems II — 3 hrs.
Technical issues in GIS and ways of implementing GIS as a decision support system for solving problems of a spatial nature in selected fields. Lecture, 2 periods; lab, 2 periods. Prerequisite(s): GEOG 2410 or consent of instructor; junior standing. (Spring)

Utilization of global positioning system (GPS) to collect, process, and analyze geographic data. GPS theory and techniques including field survey experiences. Applications within an integrated geographic information system (GIS) framework. (Fall)

GEOG 3580. Readings in Geography — 1-3 hrs.
Maximum of 3 hours can be applied toward Geography major. Prerequisite(s): consent of department head. (Fall, Spring, Summer)

GEOG 3598. Research Experience in Geography — 1-3 hrs.
Conducting of supervised research or scholarly project. May be repeated for maximum of 6 hours. Prerequisite(s): 15 hours of geography; consent of instructor. (Fall, Spring, Summer)

GEOG 3778/5778. Spatial Data Analysis — 3 hrs.
Analysis and interpretation of spatial point processes, area, geostatistical and spatial interaction data. Applications to geographic data in real estate, biology, environmental and agricultural sciences using S-Plus software. Prerequisite(s): STAT 1774 or STAT 1772 or SOC SCI 2020; junior standing. (Same as STAT 3778/5778) (Odd Springs)

Examination of the nature and dynamics of culture relative to issues and landscapes that arise out of the interactions between people and their physical and human environments. Special emphasis on socio-economic development and the process of globalization. Prerequisite(s): junior standing. (Odd Springs)

GEOG 4115/5115. Climate Change and Social Justice — 3 hrs.
This is a participatory action research focused class where students engage in research on climate change social justice issues in and around Iowa. Prerequisite(s): junior standing. (Fall)

GEOG 4120/5120. Demography and Population Geography — 3 hrs.
Geographic perspectives on demography and migration in a changing world. Patterns, processes, and models of population structure, change, distribution, and movement. Relationships with complex spatial mosaic of socioeconomic and environmental systems. Elements of population analysis and geodemographics. Prerequisite(s): junior standing. (Even Springs)

An introduction to the urban planning process, with a focus on climate action planning. The course includes a discussion of climate action best practices from cities around the world, as well as opportunities for actual community engagement in Iowa cities and towns to develop strategies for greenhouse gas reduction and other practices to enhance sustainability. Prerequisite(s): junior standing. (Spring)

GEOG 4220/5220. Soils and Landscapes — 3 hrs.
Study of soils as result of inter-relationships among climates, ecosystems, and landscapes of the world. Soil formation, distribution, properties, classification, and applications of soil geography to other disciplines. Lecture, 2 periods; lab/field trips, 2 periods. Prerequisite(s): EARTHSCI 1300 or GEOG 1210; junior standing. (Odd Falls)

GEOG 4230/5230. Rivers — 3 hrs.
Runoff processes, stream discharge, sediment transport, drainage basins, properties of alluvium, channel changes, floodplains, terraces, human adjustments to floods, human impacts on rivers, and river water quality. Prerequisite(s): junior standing. (Even Springs)

GEOG 4240/5240. The Ice Age — 3 hrs.
Study of earth systems, long-term environmental change, and methods used to detect such change. Evidence of environmental changes resulting from glacial-interglacial conditions and how large scale changes in Earth climate systems affect environmental systems. Prerequisite(s): GEOG 1210; GEOG 2210; EARTHSCI 1300 or consent of instructor; junior standing. (Even Falls)

GEOG 4250/5250. Laboratory Methods in Environmental Geography — 3 hrs.
Intended to make students proficient in the common laboratory techniques used for analyzing soil and sediments for environmental geography. Prerequisite(s): EARTHSCI 1300 or GEOG 1210; junior standing. (Even Springs)

GEOG 4310/5310. GIS Applications: (Variable Topic) — 3 hrs.
GIS techniques to conduct spatial analysis of social and environmental topics. Focus on an individual research project and associated functional capabilities of GIS packages. Variable social/environmental focus. May be taken more than once for credit. Prerequisite(s): GEOG 2410; junior standing. (Spring)
GEOG 4335/5335. Web Mapping and GIS — 3 hrs.
An applied course examining state of the art web mapping and Geographic Information Systems server technologies. Students will gain hands-on experience utilizing a variety of cloud-based technologies and simple scripting techniques to build web mapping applications and visualizations. Prior programming experience is not required. Prerequisite(s): GEOG 1310 or GEOG 2410 or consent of instructor; junior standing. (Odd Falls)

GEOG 4380/5380. Satellite Image Processing — 3 hrs.
Scientific and computational foundation of digital image processing techniques for extraction of earth resources information from remotely sensed satellite data. Prerequisite(s): GEOG 3380; junior standing. (Even Springs)

This class will provide an in-depth training on the uses of unmanned aerial systems (UAS) for environmental mapping. Topics will include: photogrammetry, advanced remote sensing, geospatial data accuracy, aerial photography survey design, and geospatial data processing/post-processing. Students will engage in classroom and field exercises and will gain hands-on experience with data collection using a variety of UAS. Field trips are required. Prerequisite(s): GEOG 3380 or consent of instructor; junior standing. (Spring)

GEOG 4390/5390. GIS Programming — 3 hrs.
An applied course in Python programming for ArcGIS automation and customization. Students will gain hands-on experience with ArcGIS Geoprocessing framework, basic programming concepts, Python fundamentals, and writing Python scripts for geoprocessing and map automation. Prior programming experience is not required. Prerequisite(s): GEOG 2410 or consent of instructor; junior standing. (Spring)

GEOG 4395/5395. Geographic Research Methods — 3 hrs.
This course is intended for secondary social science teaching majors to focus on geography. It will cover the geographic approach, foundational knowledge in geography (human, physical, and geospatial), the use of online GIS, and the application of this material in the K-12 education setting. Prerequisite(s): GEOG 1110 or GEOG 1120; GEOG 1210. (Spring)

GEOG 4550. Senior Seminar in Geography — 3 hrs.
Examination of specific topics through application of geographic principles and analysis. Discussion of readings during first half semester and student presentations during second half semester. Research paper required. Prerequisite(s): 21 hours of geography. (Spring)

GEOG 4550. Professional Seminar — 1 hr.
Issues and opportunities involved in transition from undergraduate to professional life. Design and completion of essential documents including resume, professional portfolio, graduate program applications, and standardized examinations. Prerequisite(s): junior standing. (Fall)

GEOG 5150. Regional Geography: (Variable Topic) — 3 hrs.
Study of geography of selected region including evolution and dynamics of its cultural, social, economic, political, and environmental dimensions. May be repeated on different regions. (Fall and Spring)

Exploring the core concepts of geomorphology and biogeography in the context of the landscapes of North American national parks and protected places. Prerequisite(s): GEOG 1210 or EARTHSCI 1300. (Odd Springs)

GEOG 5320. Geographic Information Systems II — 3 hrs.
Technical issues in GIS and ways of implementing GIS as a decision support system for solving problems of a spatial nature in selected fields. Lecture, 2 periods; lab, 2 periods. Prerequisite(s): GEOG 2410 or consent of instructor; junior standing. (Spring)

Utilization of global positioning system (GPS) to collect, process, and analyze geographic data. GPS theory and techniques including field survey experiences. Applications within an integrated geographic information system (GIS) framework. (Fall)

GEOG 5360. Cartographic Design — 3 hrs.
Application of cartographic principles and techniques in compiling thematic maps. Emphasis on cartographic production including the use of map projections, data characterization and symbolization, graphing, color use, typographic and design elements, and thematic mapping techniques. (Fall)

Examination of physical basis of Remote Sensing and various sensing systems available for monitoring, mapping, measuring, and identifying phenomena on the earth's surface. Emphasis on non-photographic systems operating within the electromagnetic continuum. Various modes of multispectral scanning. Lecture, 2 periods; lab, 2 periods. (Fall)

GEOG 6000. Graduate Colloquium — 1 hr.
Weekly presentations by a faculty member, visitor, or student. May be repeated for maximum of 2 hours. (Fall and Spring)

GEOG 6010. Geographic Research Methods — 3 hrs.
The purpose of this course is to develop an appreciation for the process of research as practiced by contemporary professional geographers. Topics covered include formulating research problems, reviewing and critiquing published literature, developing and executing a research design, institutional review boards, funding programs, proposal writing and application, and completing a research project. (Spring)

GEOG 6285. Readings in Geography — 1-3 hrs.
May be repeated. Prerequisite(s): consent of department head. (Fall, Spring, Summer)

GEOG 6286. Studies In: (Variable Topics).
Studies In: (Variable Topics) (Variable)

GEOG 6299. Research.
Prerequisite(s): consent of department. (Fall, Spring, Summer)

Utilization of global positioning system (GPS) to collect, process, and analyze geographic data. GPS theory and techniques including field survey experiences. Applications within an integrated geographic information system (GIS) framework. (Fall)

GEOG 6598. Directed Research Project — 3 hrs.
Research leading to research paper for students in the non-thesis option. Prerequisite(s): GEOG 6010. (Fall, Spring, Summer)