

# GEOGRAPHY (GEOG)

## Geography Graduate Courses

### **GEOG 8000 HISTORY AND PHILOSOPHY OF GEOGRAPHY (3 credits)**

Introduction to history of geography. Emphasis on significant concepts, methodologies, and philosophies in geography from classical Greeks to the present.

**Prerequisite(s):** Permission

### **GEOG 8016 CONSERVATION OF NATURAL RESOURCES (3 credits)**

This course provides a diverse overview of the principles and contemporary issues related to ecology and management of wildlife, fisheries, forests, soil, rangeland, minerals, and water. It includes the philosophical, economic and social aspects of resource management. Current local, regional, and global issues are examined. (Cross-listed with GEOG 4010).

**Prerequisite(s):** Three hours of geography

### **GEOG 8026 SPATIAL ANALYSIS IN GEOGRAPHY (3 credits)**

An introduction to spatial analysis with a focus on spatial statistics. Emphasis will be placed on the nature of geographic data, spatial data handling, modeling logic, sampling theory, and design. Both descriptive and spatial statistics methods are covered. Students will receive hands-on experience working with statistical data sets, software, and scientific visualization of research results. (Cross-listed with GEOG 4020).

**Prerequisite(s):** STAT 1530 or STAT 3000 and GEOG 4050 or permission

### **GEOG 8036 COMPUTER MAPPING AND VISUALIZATION (3 credits)**

Computer techniques in the mapping and visualization of spatial data. Various forms of spatial data manipulation and computer graphic output techniques are examined. Particular attention is given to the creation of maps for the internet and the incorporation of interaction and animation in their display. (Cross-listed with GEOG 4030).

**Prerequisite(s):** GEOG 1090 or permission of instructor. Background in programming, particularly JavaScript, highly recommended.

### **GEOG 8040 SEMINAR IN EDUCATION GEOGRAPHY (3 credits)**

This seminar surveys the goals, methods, and content associated with teaching geography in elementary, secondary, and in higher education. It is designed to aid current and future teachers in teaching geography.

**Prerequisite(s):** Permission

### **GEOG 8046 GEOARCHAEOLOGY (3 credits)**

An introduction to geoarchaeology: the application of methods and techniques of geography, geology and other earth sciences to solve archaeological problems and reconstruct past environments. (Cross-listed with GEOL 4040, GEOG 4040).

### **GEOG 8056 GEOGRAPHIC INFORMATION SYSTEMS I (4 credits)**

An introduction to the concepts and principles of geographic information systems (GIS). Emphasis will be placed on geographic data inputs, manipulation, analysis, and output functions. Exercises introduce students to GIS software and applications. Usually offered Fall, Spring, Summer. (Cross-listed with GEOG 4050).

**Prerequisite(s):** 3 hours in Geography or by permission

### **GEOG 8106 BIOGEOGRAPHY (3 credits)**

This course is intended as an introduction to biogeography, the study of the distribution and evolution of organisms across space and through time. Usually offered every year. (Cross-listed with BIOL 4100, GEOL 4100, BIOL 8106, GEOL 8106, GEOG 4100).

**Prerequisite(s):** BIOL 1450 and BIOL 1750 or GEOL 3100 or BIOL 3100, junior-senior

### **GEOG 8126 URBAN GEOGRAPHY (3 credits)**

This course is designed to serve as an introduction to the complex and dynamic urban system, including the physical, economic, political, cultural, social, and environmental forces that shape the form and function of cities, as well as how individuals and groups experience urban life. We make ample use of geographic information systems (GIS) to analyze cities and better understand crucial urban concepts such as urban growth and development, patterns of urban form, segregation and neighborhood change, economic specialization and agglomeration, urban sprawl, and environmental justice. (Offered Fall) (Cross-listed with GEOG 4120).

### **GEOG 8130 SEMINAR IN ECONOMIC GEOGRAPHY (3 credits)**

This seminar course investigates the development of current world economic systems through the elements of primary, secondary, tertiary, quaternary and quinary production on a micro and macro scale. Exchange and transactional systems, consumption linkages, resource management, economic health on global and local scales, and location decision-making are major topics.

**Prerequisite(s):** Graduate in geography and permission of instructor

### **GEOG 8136 POLITICAL GEOGRAPHY (3 credits)**

An introduction to the basic concepts and approaches in contemporary political geography at the global, national and local scales. Core topics to be examined include geopolitics, imperialism, war and peace, global ecopolitics, states, nationalism and electoral geography. (Offered Fall) (Cross-listed with GEOG 4130).

**Prerequisite(s):** Graduate status

### **GEOG 8156 GEOGRAPHY, GENDER AND ENTREPRENEURSHIP (3 credits)**

An advanced seminar focused on links among geography, gender and work, emphasizing leadership and entrepreneurship. The course considers theory and method in addition to empirical work. The nature of space, of gender, and of work, are examined. Topics include the gendering of work, the geography of entrepreneurship, gender and leadership. (Cross-listed with WGST 4150, GEOG 4150, ENTR 4150, ENTR 8156, WGST 8156).

**Prerequisite(s):** Junior, senior, or graduate standing, or permission of instructor.

### **GEOG 8166 URBAN SUSTAINABILITY (3 credits)**

Using sustainability as a conceptual framework, students in this course will investigate a variety of social, economic, and environmental challenges facing cities of the 21st century. Topics and issues explored include urban growth and expansion, livability, equity & gentrification, energy use & production, urban farming, poverty, automobility & transportation, water security, urban pollution, and the role of cities in climate change. (Cross-listed with GEOG 4160)

**Prerequisite(s):** Graduate standing.

### **GEOG 8176 ADVANCED CULTURAL GEOGRAPHY (3 credits)**

This course examines current theoretical debate and research practice in a select topic in Cultural Geography. Emphasis will be on readings and discussion with students engaging in original research. Specific thematic focus will vary from year to year. This course may be taken multiple times as long as topics differ. (Cross-listed with GEOG 4170).

**Prerequisite(s):** Graduate standing and permission of the instructor.

### **GEOG 8206 WATER QUALITY (3 credits)**

This class will apply chemical principles to the aquatic environment to understand how and why water quality varies. Integrated lectures and labs will focus on completing a class-defined, locally-explorable water quality project. Students will also gain basic water sampling and analysis skills. (Cross-listed with GEOG 4200, GEOL 4200).

**Prerequisite(s):** One of the following: GEOL 2750, GEOL 4540, CHEM 1140, CHEM 1180, or instructor permission.

### **GEOG 8210 SEMINAR IN CULTURAL GEOGRAPHY (3 credits)**

This course explores the different theoretical, methodological and empirical approaches in cultural geography, while also addressing its development, its evolution, its competing schools of thought, and new frontiers.

**Prerequisite(s):** Permission

**GEOG 8216 GEOGRAPHIES OF SEXUALITIES (3 credits)**

How are geography and sexuality related? What have cities got to do with sexual identities? Can rural spaces foster diverse sexual communities? These and related questions are the focus of this upper-level undergraduate and graduate-level course. Students read scholarly work by and about LGBTQ+ (Lesbian, Gay, Bisexual, Transgender, Queer, and +), and cisgender people, and their lived experiences creating and inhabiting different geographies. Students gain an appreciation for the social construction of diverse sexualized spaces and considers questions about equity and policy through case studies in a variety of countries. Each student also researches a course-relevant topic they choose. (Cross-listed with GEOG 4210, WGST 4210, WGST 8216).

**GEOG 8236 GREAT PLAINS & NEBRASKA (3 credits)**

This course is a comprehensive examination of the Great Plains region from a geographical perspective. It considers both the physical and human geography of the Plains, with particular attention to our home, Nebraska. Topics to be covered include: the Plains' unique ecosystems, its early human inhabitants, its later settlers, its evolving land-use patterns, and current issues. (Cross-listed with GEOG 4230).

**GEOG 8266 PROCESS GEOMORPHOLOGY (4 credits)**

A lecture and laboratory course focused on understanding Earth surface processes and the evolution of landforms across spatial and temporal scales. The course emphasizes applying unifying concepts in geomorphology, quantitative methodology and modern process-oriented geomorphology to interpret landscape evolution. (Cross-listed with GEOG 4260, GEOL 4260).

**Prerequisite(s):** One of the following: GEOL 1010, GEOL 1170, GEOG 1030, GEOG 1050 or instructor permission.

**GEOG 8310 GEOGRAPHY OF AGRICULTURE (3 credits)**

A systematic study of the characteristics and patterns of world agriculture. Usually offered on demand.

**Prerequisite(s):** Permission

**GEOG 8326 CLIMATOLOGY (3 credits)**

A study of climatic processes and their effect on shaping the physical landscape. Emphasis on physical and applied aspects of the field. (Cross-listed with GEOG 4320).

**Prerequisite(s):** GEOG 1030, GEOG 1050, GEOG 3510, or permission of instructor.

**GEOG 8336 SOIL GENESIS, MORPHOLOGY AND CLASSIFICATION (4 credits)**

This course is designed to familiarize students with basic soil chemical, physical and biological properties, soil morphological characteristics, soil classification and soil forming processes. The course focuses on relationships between soils and environmental factors and how such factors alter soil forming processes. The lab will focus on developing basic field skills, including soil morphological descriptions and soil mapping, as well as common laboratory methods used to analyze soils. (Cross-listed with GEOG 4330, GEOL 4330).

**Prerequisite(s):** One of the following: GEOG 1030, GEOG 1050, GEOL 1010, GEOL 1170 or instructor permission.

**GEOG 8346 WATER RESOURCES (3 credits)**

This course explores the applied principles of hydrology, water systems modeling, river basin development, and water management issues and practices in the United States and other parts of the world. Two local Saturday field trips will be required. (Cross-listed with GEOG 4340).

**Prerequisite(s):** Six hours of Physical Geography or equivalent and graduate standing.

**GEOG 8356 GLOBAL CLIMATE CHANGE (3 credits)**

The primary objective of this course is for students to form a scientific, evidence-based, stance on current and future changes to the Earth's climate. To this end, this course will be based on scientific inquiry into the current state of knowledge. Particular emphases are placed on evidence and causes of change, and the associated environmental and social impacts, including: water resources, extreme weather, human health, and others of interest to the class. (Cross-listed with GEOG 4350, ENVN 8356, ENVN 4350).

**Prerequisite(s):** Graduate standing

**GEOG 8406 EMERGING TOPICS IN GEOGRAPHY (3 credits)**

Emerging Topics in Geography focuses on the latest research areas in the field of geography. The specific topic of each course set will be based on the research trends in geography. This course will be offered on demand. (Cross-listed with GEOG 4400).

**Prerequisite(s):** Permission of the instructor

**GEOG 8456 GEOHYDROLOGY (3 credits)**

A course dealing with geology, chemistry and hydraulics of groundwater. Designed mainly for Geology majors but can be helpful to other disciplines where ground water is involved. (Cross-listed with GEOG 4450, GEOL 4450).

**GEOG 8500 SPECIAL TOPICS IN GEOGRAPHY (3 credits)**

This course will provide for an in-depth study of a geographical or geological subject (as specified in the course subtitle). Subjects will be offered as sections of GEOG 8500, but will be separate from one another. Students may repeat GEOG 8500 as often as they like as long as no specific subject is duplicated. Course to be offered with approval of Graduate Program Committee and Dean for Graduate Studies.

**Prerequisite(s):** Permission of instructor

**GEOG 8535 CARTOGRAPHY AND DATA VISUALIZATION (4 credits)**

An introduction to the concepts and techniques of map construction and visual data communication. Topics include map scale, map projections, thematic cartography, history of cartography, computer mapping, and global positioning systems. Particular attention is given to designing both paper and Internet distributed maps. This course is offered in both the Fall and Spring semesters. (Cross-listed with GEOG 3530).

**Prerequisite(s):** GEOG 1000 or GEOG 1020 and GEOG 1030 or GEOG 1050

**GEOG 8536 HISTORICAL GEOGRAPHY OF THE UNITED STATES (3 credits)**

This course examines the geography, physical and human, real, perceived, or theoretical, of the United States' historical development. It considers the ways history has and has not been affected by geography. It will also cover the field of historical geography, its theories and practices. (Cross-listed with GEOG 4530).

**GEOG 8556 GEOGRAPHY OF ECONOMIC GLOBALIZATION (3 credits)**

A study of the geography of economic globalization and the geography of the world economy. The major topics include the historical development of the world economy and globalization from the geographical perspective, trends in geography of global production, trade and investment, the most important factors and actors in the globalization processes and its geographic effects, geography of transnational corporations, case studies of economic geography of selected industries and service activities, effects of globalization on the developed and developing countries. This course also supports the Cultural and Global Analysis concentration in the Master of Arts in Critical and Creative Thinking. (Cross-listed with GEOG 4550, CACT 8116).

**Prerequisite(s):** Graduate status.

**GEOG 8600 INDEPENDENT RESEARCH (1-3 credits)**

This is an independent research course, where students undertake and complete a focused independent project under faculty supervision, exploring an aspect of geography in greater depth.

**Prerequisite(s):** Completed independent research contract between faculty and student and permission of adviser or the Graduate Studies Coordinator.

**GEOG 8616 ENVIRONMENTAL MONITORING AND ASSESSMENT (3 credits)**

An interdisciplinary approach to techniques for the design and implementation of environmental inventory and monitoring schemes used to evaluate natural resources. Students work as teams to synthesize information from their backgrounds in geography, geology and ecology to evaluate the impacts of human actions on environmental quality following the framework for environmental assessments provided by the National Environmental Policy Act. Course is organized to accommodate variable needs of students with different backgrounds and career choices. Usually offered every year. (Cross-listed with BIOL 4610, ENVN 4610, GEOG 4610, GEOL 4610, GEOL 8616)

**Prerequisite(s):** Permission of instructor.

**GEOG 8626 GEOGRAPHICAL FIELD STUDIES (3 credits)**

Field experience course based on variable topics and themes. Students must attend the multiple day field trip that will require overnight stays. (Cross-listed with GEOG 4620).

**Prerequisite(s):** Instructor Permission. Not open to non-degree graduate students.

**GEOG 8636 ENVIRONMENTAL REMOTE SENSING (4 credits)**

An introduction to remote sensing science and technology. Emphasis will be placed on multispectral data, matter/energy interactions, sensor system characteristics, photogrammetry, image interpretation, digital image processing, and environmental applications. Formal laboratory instruction will provide students with problem-solving skills and hands-on experience with remote sensing and GIS software. (Cross-listed with GEOG 4630).

**Prerequisite(s):** GEOG 1060 or GEOG 1070 or GEOL 1170. Introductory statistics highly recommended.

**GEOG 8640 REMOTE SENSING ADVANCED CONCEPTS AND APPLICATIONS (3 credits)**

Designed for the graduate student desiring to do advanced work in remote sensing. The emphasis of the course is on non-photographic sensors and especially digital processing of multispectral satellite data. The applications are multidisciplinary in nature. Usually offered on demand.

**Prerequisite(s):** GEOG 4630 / GEOG 8636

**GEOG 8646 CRITICAL ZONE SCIENCE (4 credits)**

This course examines the Critical Zone (CZ), Earth's permeable layer that extends from the top of vegetation to the bottom of groundwater. The CZ is a constantly evolving layer where rock, soil, water, air, and living organisms interact to regulate the landscape and natural habitats; it also determines the availability of life-sustaining resources, including our food production and water quality. CZ science is an interdisciplinary and international endeavor focused on cross-disciplinary science. In this course, we will focus on using data available from the existing National Science Foundation (NSF)-funded CZ Observatories (CZOs) along with readings, discussions and activities to explore interactions within the CZ. (Cross-listed with GEOG 4640, GEOL 4640)

**Prerequisite(s):** One of the following: GEOL 1170, GEOL 1010, GEOG 1030 or GEOG 1050; one chemistry or physics course recommended; or instructor permission.

**GEOG 8650 LAND USE (3 credits)**

Introduction to the theories and practices of land use planning. Land use planning considers the natural environment and the human activities utilizing it, studying the decisions made in human land use, in order to understand and critique current land use practices. Local, state, nation, and international case studies of land use will be considered.

**Prerequisite(s):** GEOG 4120/ GEOG 8126 Urban Geography

**GEOG 8666 GEOGRAPHIC INFORMATION SYSTEMS II (4 credits)**

An introduction to advanced geographic information systems (GIS) topics. Emphasis will be placed on algorithms and analysis for information extraction. Topics include spatial interpolation, remote sensing GIS integration, software development, spatial analysis, GIS modeling, and future advances in GIS. Formal laboratory instruction will provide students with GIS experience to solve application problems. Usually offered in Fall. (Cross-listed with GEOG 4660).

**Prerequisite(s):** GEOG 4050/ GEOG 8056

**GEOG 8670 CARTOGRAPHIC METHODS (3 credits)**

An applied graduate seminar in cartography and geospatial science. The course examines advanced methods for the representation of spatial data. Emphasis is placed on the design of interactive Internet-based maps. Projects will be directed toward the creation of map-based web pages.

**Prerequisite(s):** A junior/senior course in cartography, GIS, computer mapping, or visualization.

**GEOG 8680 SEMINAR IN GEOSPATIAL SCIENCE (3 credits)**

Seminar in Geospatial Science examines the origins, development and prospects of spatial information technology to understand people, places, and processes of the earth. The overall approach is to examine the three main components of geospatial science: 1) Geographic Information Systems (GIS), the software, hardware, outputs, personnel, and practices that together facilitate the analysis and mapping of geographic entities and phenomena; 2) Remote Sensing, the use and processing of aerial photographs and satellite imagery; and 3) Cartography, the general processing and display of geographic information for both analysis and communication.

**Prerequisite(s):** Graduate standing. Prior coursework in geographic information systems, remote sensing or cartography.

**GEOG 8700 RESEARCH METHODS (3 credits)**

The course provides students with an overview of research approaches and methods used by geographers. Students are expected to put these methods into practice by drafting a full thesis proposal by semester's end.

**GEOG 8800 INTERNSHIP IN ENVIRONMENTAL/REGIONAL PLANNING (1-6 credits)**

(repeatable up to six hours) Internship with local planning agencies enabling students to gain knowledge and experience in comprehensive regional or environmental planning. Usually offered Fall, Spring, and Summer.

**Prerequisite(s):** Permission and 12 graduate hours in geography.

**GEOG 8826 INTRODUCTION TO ENVIRONMENTAL LAW & REGULATIONS (3 credits)**

An introduction to environmental law and regulations intended for students pursuing careers in environmental sciences or related fields. The course emphasizes the origins, implementation, and enforcement of U.S. state and federal laws and regulations. Major federal environmental laws, covering air and water quality, solid and hazardous waste, pollution prevention and remediation, and natural resources will be discussed. Usually offered Fall semesters. (Cross-listed with ENVN 8826, ENVN 4820, BIOL 4820, GEOG 4820, PA 8826).

**Prerequisite(s):** Graduate Standing or Permission from the Instructor.

**GEOG 8830 SEMINAR IN URBAN STUDIES (3 credits)**

This course provides an interdisciplinary overview of the forces influencing and influenced by urbanization and urbanism. (Cross-listed with UBNS 8000)

**Prerequisite(s):** Not open to non-degree graduate students.

**GEOG 8840 DIRECTED RESEARCH IN URBAN STUDIES (3 credits)**

The course is intended for advanced graduate students in urban studies or geography. It is especially suited for those in-career students who have had their internships waived and who might profit more by in-depth research on a problem of urban studies rather than additional classroom courses. (Cross-listed with UBNS 8940).

**Prerequisite(s):** Completed 9 graduate hours in Urban Studies. Permission from the School. For Geography students, GEOG 8126 (Urban Geography) or permission from the School.

**GEOG 8990 THESIS (1-6 credits)**

Independent research project conducted under the supervision of an adviser and thesis committee.

**Prerequisite(s):** Graduate student in geography who has successfully presented and defended their thesis proposal.