

## Geography Courses

### GEOG 100 **World Regional Geography.** (3)

An introductory survey of the environmental setting, historical formative periods, and present-day issues that distinguish the major culture areas of the world.

### GEOG 101 **World Regional Geography, Honors.** (3)

An introductory survey of the environmental setting, historical formative periods, and present-day issues that distinguish the major culture areas of the world.

*Prerequisite:* Open only to students in the College Honors Program or by consent of instructor.

### GEOG 102 **Principles of Human Geography.** (3)

An examination of the relationships between humans and their environments. The course introduces students to basic concepts in human geography relating to economic activities, landscapes, languages, migrations, nations, regions, and religions. Serves as the basis for further course work in cultural, economic, political, population, and urban geography.

### GEOG 103 **Principles of Human Geography, Honors.** (3)

An introduction to how human societies organize space and modify the world about them. Resultant patterns on the landscape are interpreted through principles of space perception, cultural ecology, diffusion, land use, and location theory. Comparisons are made between urban and rural areas and between subsistence and commercial societies.

*Prerequisite:* Open only to students in the College Honors Program or by consent of instructor.

### GEOG 104 **Principles of Physical Geography.** (3)

The components of the physical environment are discussed in order to familiarize the student with their distributions and dynamic nature. Major topics include the atmosphere, landforms, soils and vegetation together with their interrelationships and their relevance to human activity. This course and Geography 105 together satisfy the laboratory science requirement.

### GEOG 105 **Introductory Laboratory in Physical Geography.** (2)

A laboratory course designed to complement Geography 104 in satisfying the laboratory science requirement. It is required for geography majors. Laboratory exercises include a wide variety of analyses using data on the atmosphere, hydrosphere, biosphere and lithosphere. *Prerequisite:* GEOG 104 which may be taken concurrently.

### GEOG 107 **Principles of Physical Geography, Honors** (3)

Interactive processes among the systems of the earth are studied and discussed. Major topics include vegetation, soils, landforms, water, the atmosphere, and cycles of matter between these portions of the earth. The course includes lectures and critical discussions to address study problems in physical geography.

*Prerequisite:* Open only to students in the College Honors Program or by consent of instructor.

### GEOG 111 **Maps and Mapping.** (4)

How do people find their way to there or just around? Simple--they use maps. Maybe not maps on pieces of paper but instead in their heads: mental maps. Different people have different maps, even of the same place. Mapping is an ancient form of communication that has created ideas and opinions, promoted understanding and confusion. A non-technical approach to the transformation of space onto maps, their content and structure, and to their role and impact in human activity, past and present. Neither background in geography nor artistic skills are required.

### GEOG 140 **Global Environment I: The Discovery of Environmental Change.** (3)

Same as EVRN 140 and HIST 140

This interdisciplinary course and its laboratory (GEOG/EVRN/HIST 141) survey the foundations of

environmental understanding and the process of scientific discovery from perspectives that combine the principles and methodologies of the humanities, physical, life and social sciences. Key topics will include the history of environmental systems and life on earth, the discovery of biotic evolution, ecological change, and climate change. To be taken with GEOG/EVRN/HIST 141.

### GEOG 141 **Global Environment I: Interdisciplinary Laboratory.** (2)

Same as EVRN 141 and HIST 141

This laboratory applies the principles and methodologies of the humanities, physical, life and social sciences to earth systems and the development of environmental understanding using historical and present-day examples. To be taken with GEOG/EVRN/HIST 140.

### GEOG 142 **Global Environment II: The Ecology of Human Civilization.** (3)

Same as EVRN 142 and HIST 142

This interdisciplinary course and its laboratory (GEOG/EVRN/HIST 143) survey the history of humanity's relationship with the natural world over the long term from perspectives that combine the principles and methodologies of the humanities, physical, life and social sciences. Key topics will include the evolution of Homo sapiens and cultural systems; the development of hunter, gatherer, fisher, agricultural, and pastoral lifeways; the ecology of colonialism and industrial civilization, and the emergence of ideological and ethical perspectives on the relationship between nature and culture. To be taken with GEOG/EVRN/HIST 143.

### GEOG 143 **Global Environment II: Interdisciplinary Laboratory.** (2)

Same as EVRN 143 and HIST 143

This laboratory applies the principles and methodologies of the humanities, physical, life and social sciences to the humanity's engagement with the global environment using historical and present-day examples. To be taken with GEOG/EVRN/HIST 142.

### GEOG 148 **Scientific Principles of Environmental Studies.** (3)

Same as EVRN 148

This course presents an overview of our understanding of environmental processes and environmental issues. Topics include scientific principles, population and resource issues, pollution and global change, and land use and management. This course gives students a rigorous understanding of interactions between humans and their environment, and provides students with a scientific basis for making informed environmental decisions.

### GEOG 149 **Scientific Principles of Environmental Studies, Honors.** (3)

Same as EVRN 149

This course presents an overview of our understanding of environmental processes and environmental issues. Topics include scientific principles, population and resource issues, pollution and global change, and land use and management. This course gives students a rigorous understanding of interactions between humans and their environment, and provides students with a scientific basis for making informed environmental decisions.

*Prerequisite:* Open only to students in the College Honors Program or by consent of instructor.

### GEOG 150 **Environment, Culture and Society.** (3)

Same as EVRN 150

An introduction to geographic approaches to the study of the environment, emphasizing societal and cultural factors that influence human interaction with the biosphere, hydrosphere, lithosphere, and atmosphere. The course involves analysis of a broad range of contemporary environmental issues from the local

to global scales.

**GEOG 210 Computers, Maps and Geographic Analysis. (3)**

This course will introduce students to a number of different methods for the visualization, representation and analysis of geographical phenomena. Both field and computer-based techniques will be employed to demonstrate the concept of experimental design and the collection, processing, and analysis of geographical data. Topics include: 1) the unique nature of geographic data; 2) mapping techniques and technologies; 3) geographical information systems; 4) remote sensing (aerial photography and satellite imagery); and 5) methods of geographical analysis (e.g., statistic and spatial modeling).

**GEOG 304 Environmental Conservation. (3)**

Same as EVRN 304

A survey of current methods of describing and modeling the function, structure and productivity of natural and anthropogenically modified earth resource systems, along with a discussion of contemporary views of what constitutes a natural landscape. Fundamental natural science principles about the interplay among lithospheric, atmospheric, hydrospheric, and biospheric components of earth systems are emphasized. Uses of natural resources, including fossil fuels, minerals, and water are described with attention to the earth's total energy budget. Human activities that affect preservation, conservation, and multiple uses of earth regions receive attention. Systems under stress through population and other contemporary forces serve as examples.

**GEOG 311 Map Conception and Development. (4)**

An examination of the map production process with emphasis on two areas: the *mental map* formed during interaction with the environment, and the *map as a physical object*, which emerges from mapping activity. A local area will serve as the laboratory/environment for the mapping activity including production and use.

**GEOG 316 Methods of Analyzing Geographical Data. (4)**

Introduces the benefits and limitations of using quantitative methods to analyze geographical problems. Covers traditional descriptive (e.g., measures of central tendency) and inferential statistics (e.g., hypothesis testing), but also inherently geographical approaches such as shape and point pattern analysis, and spatial autocorrelation. Laboratory emphasizes using the computer to explore and analyze geographical problems.

**GEOG 319 Topics in Techniques: \_\_\_\_\_ (1-3)**

An investigation of special topics in Techniques. May include coursework in cartography, GIS, or remote sensing. May be repeated if topic differs.

**GEOG 321 Climate and Climate Change. (3)**

Same as ATMO 321

This course is designed to introduce students to the nature of the Earth's physical climate. It will introduce the basic scientific concepts underlying our understanding of our climate system. Particular emphasis will be placed on energy and water balances and their roles in evaluating climate change. The course will also evaluate the impact of climate on living organisms and the human environment. Finally, past climates will be discussed and potential future climate change and its impact on humans will be evaluated. *Prerequisite:* GEOG 104 or ATMO 105.

**GEOG 331 Regional Geomorphology of the United States. (3)**

This course examines forces and processes affecting the earth's surface, and furthermore identifies and describes the physiographic regions that are the result of these processes. Special efforts are made to explore various photographic resources, satellite imagery, and internet sources of geomorphic data from a regional perspective since there is no wholly satisfactory text available for the course. A research paper is required. *Prerequisite:* An introductory earth science course or consent of the instructor.

**GEOG 332 Glaciers and Landscape. (3)**

Elements from glaciology, geology, and climatology are merged to examine the interactions between glaciers and their natural environments, including the processes involved in glacier formation, the relationship between glaciers and climate, the mechanisms of glacier flow, and interpretation of the Earth's glacial record. Emphasis is placed on an interdisciplinary approach to study environmental change and paleoclimate reconstruction.

*Prerequisite:* GEOG 104, GEOL 101, or consent of instructor.

**GEOG 335 Introduction to Soil Geography. (4)**

Same as EVRN 335

This course focuses on the properties and processes of soils as they occur in their environment. The student is introduced to the nature of soil as it functions as a body; genesis of soils; properties of soil solids especially colloids; soil chemical composition, properties, and reactions; interaction between solid, liquid, and gaseous components in soils; plant-soil-water relationships; biological interactions with soil; classification of soils; and the distribution of soils on the landscape. Laboratory section is required. Not open to students who have taken GEOG 535.

*Prerequisite:* GEOG 104 or GEOL 101 or consent of instructor; BIOL 100 and CHEM 184 or CHEM 185 recommended.

**GEOG 338 Introduction to River Systems. (3)**

A course on fluvial geomorphology. Topics include the drainage basin, fluvial processes, river channel adjustment and forms, human disturbance and geomorphic response, and research methods in fluvial geomorphology. Field trip. *Prerequisite:* GEOG 104.

**GEOG 339 Topics in Physical Geography: \_\_\_\_\_ (1-3)**

An investigation of special topics in Physical Geography. May include coursework under headings of soils, vegetation, climate, or geomorphology. May be repeated if topic differs.

**GEOG 350 Physical Geography of Africa. (3)**

Same as AFS 350

This course is a survey of the basic physical features of the African continent including structure and relief, rivers and lakes, soils and mineral resources. It includes characteristics and processes of African climates, and the ecology of Africa's four major biomes: tropical rain forest, savanna, steppe, and desert. Climatic and environmental variations of the past, emergence of humankind, and development of pastoral and farming systems are discussed. Contemporary environmental concerns also include deforestation and desertification, the impacts of drought, methods for monitoring African environments, and Africa's prospects in a 21st century suffering from global warming.

**GEOG 351 Africa's Human Geographies. (3)**

Same as AAAS 351

An introduction to historical, cultural, social, political, and economic issues in Africa from a geographic perspective. The course begins with the historical geography of humanity in Africa, from ancient times through the present. Other topics include cultural dynamics, demography, health, rural development, urbanization, gender issues, and political geography. Case studies from Eastern and Southern Africa will be used to illustrate major themes.

**GEOG 352 Economic Geography. (3)**

This course offers an overview of contemporary economic geography with an underlying theme of uneven regional development. Topics examined include: the historical context in which capitalism emerged; the major theoretical approaches used to understand the temporal and spatial dynamics of capitalist society; a series of case studies of different economic sectors; and the global economy, including its development with respect to colonialism, neocolonialism, international trade, third world development, and population growth.

**GEOG 357 History and Philosophy of Geographic Information Science (3)**

An examination of the development of geographic information science (GISci) from its roots in traditional geography, cartography, and remote sensing to modern geographic information systems (GIS). GIS will be explored as a new scientific instrument, a “macroscope,” for representing and analyzing complex earth processes, both physical and cultural. The societal benefits and risks of GIS will be demonstrated and discussed.

**GEOG 358 Principles of Geographic Information Systems. (4)**

An introduction to computer-based analysis of spatial data. Covers basic principles of collecting, storing, analyzing and displaying spatial data. Emphasis is on problem-solving activities using common spatial analytical techniques (e.g., map overlay). The student will gain extensive hands-on experience with state-of-the-art GIS software.

**GEOG 370 Introduction to Cultural Geography. (3)**

Charts some of the major lines of research in cultural geography, including critical theory, political economy, poststructuralist thought, feminism, and global consumption. Through fieldwork, diverse research methods are applied to issues such as community development, cultural patterns on the landscape and global impacts on local economies.

*Prerequisite:* GEOG 100, 101, 102 or 103; or consent of instructor.

**GEOG 371 Environmental Geopolitics. (3)**

Same as EVRN 371

This course is structured by a framework of geopolitics and critical geopolitics. We will engage with literature that demonstrates critical thinking about how human relationships with the biophysical world are portrayed and politicized. We will examine key contributions to the environmental security, resource conflicts, and related literatures. We will discuss how and why the environment is featured in debates about security and conflict as well as geopolitical assumptions on which these debates build. Learning objectives for this course include: 1) develop and apply, in writing and in discussion, critical thinking skills with particular attention to geopolitical interests, 2) develop and demonstrate an understanding of key debates about environment and security, resource conflicts, and the construction of environmental fears, 3) develop and demonstrate an ability to identify and discuss how themes in the course are evident in mainstream media and public debate.

**GEOG 375 Intermediate human Geography. (3)**

An examination of processes of cultural-economic interaction and patterns of human activity on a global scale. The topics cover the whole spectrum of human geography, with focus on urban-economic development, innovation and diffusion, and trade. Each week the third hour will be devoted to discussion of topics dealt with in lectures presented during the first two hours.

*Prerequisite:* Introductory course in Geography or consent of the instructor.

**GEOG 377 Urban Geography. (3)**

This course explores the city from the multiple perspectives of its inhabitants. The cultural viewpoints of place, gender, age, and ethnicity are stressed, but traditional economic topics such as urban hierarchy, functions of the city, suburbanization, and ongoing changes in core and peripheral areas also receive attention. The distinctive landscapes of individual North American cities are emphasized, but examples also are drawn from throughout the world.

**GEOG 379 Topics in Cultural Geography: \_\_\_\_\_ (1-3)**

An investigation of special topics in Cultural Geography. May include coursework under headings of culture theory, material culture, language, foodways, or religion. May be repeated if topic differs.

**GEOG 390 Geography of the United States and Canada. (3)**

Same as AM S 390

A study of the different physical, economic, and cultural settings in the United States and Canada which form the basis for the various forms of livelihood. Emphasis is on the United States.

*Prerequisite:* An Introductory geography course or background in United States or Canadian history, social science, or culture or consent of the instructor.

**GEOG 395 Environmental Issues of: \_\_\_\_\_ (3)**

This regional geography course examines contemporary environmental issues of a particular region of the world based on the expertise of the professor. Course emphasis is on the interaction of natural, socio-economic, and cultural factors of development that give rise to environmental problems. Students learn how local, national, and international government and non-governmental stakeholders address environmental problems. Course may be repeated with different professors.

**GEOG 396 China’s Geographies. (3)**

An appreciation of how China and the Chinese way of life has evolved. Confucianism, Buddhism, Taoism, and communism are examined as the bases of Chinese culture values. These values are then set against a highly varied physical and economic landscape to show how an elaborate and complex society has come into being. Contemporary developments are discussed only as a part of the entire spectrum of Chinese history.

**GEOG 397 Geography of Kansas and the Plains. (3)**

A study of the different physical, economic, and cultural settings in Kansas and the Plains that form the basis for various kinds of livelihood.

**GEOG 399 Topics in Regional Geography: \_\_\_\_\_ (1-3)**

An investigation of special topics in Regional Studies. May include coursework related to a specific country or region. May be repeated if topic differs.

**GEOG 410 Human Biogeography, Honors (3) N**

Same as BIOL 410

Natural science principles of evolution and earth change are used to examine distributions of the populations, economies, and resource uses of humans. Lecture and discussion.

*Prerequisites:* BIOL 152 or 153 or GEOG 107 and membership in the University Honors Program, or consent of the instructor.

**GEOG 418 Workshop in Production Cartography. (1-3)**

Theory and practice of map production and other related graphics using the latest graphic and GIS software. Projects vary but include the processes of design and production, editing and quality control, and a final printed or operational product. Involves a weekly consultation session and laboratory time in KU Cartographic & GIS Services.

*Prerequisite:* Completion of GEOG 311 with a grade of B or better and consent of instructor.

**GEOG 433 Biogeography Field and Laboratory Techniques (3)**

Same as EVRN 433

This course provides undergraduate students with practical experience in field data collection techniques and laboratory data analysis methods. During the first half of the semester, students will work in the field using a variety of methods to measure such vegetation characteristics as: cover, density, biomass, leaf area, and canopy architecture. Students will gain experience in the use of field instruments including a spectroradiometer, and techniques for quantifying vegetation biophysical attributes. During the later part of the course, students will learn to summarize their field data and examine relationships between the vegetation attributes and measurements made using remote sensing instruments. Recommended: Geog 316 or an introductory statistics equivalent.

**GEOG 458 Geographical Information Systems: \_\_\_\_\_ (1-6)**

An introduction to the organization and components of geographic information systems and their software. Fundamental

concepts and their implementation with applications to physical and human systems.

**GEOG 490 Geographic Internship.** (1-6)

Supervised practical experience. The student submits a proposal describing the internship prior to enrollment. Upon acceptance, regularly scheduled meetings with the advisor provide assistance, guidance and evaluation of progress in the professional experience. A written summary of the experience or outcomes of the research project are prepared independently by the student, a representative of the host agency, and the advisor. Total credit not to exceed six hours (typically 80 work hours equate to one academic credit hour)

*Prerequisite:* 15 hours of geography and permission of instructor.

**GEOG 498 Special Topics in Geography.** (1-5)

*Prerequisite:* 15 hours of geography.

**GEOG 499 Honors Course in Geography.** (2-3)

Open to students with nine hours of upperclass credit in geography, an average of at least 3.5 in all geography courses and a general average of at least 3.25. Includes the preparation of an honors paper and its defense before a committee of at least 2 regular members.

**GEOG 500 Senior Capstone in Geography.** (3)

The capstone project provides students with a broad-based, interdisciplinary educational experience and allows them to integrate and synthesize the knowledge they have gained in their studies. The course is designed to achieve several objectives: provide an overview of geography as a unified, coherent discipline with multiple perspectives, emphasize writing and analytical skills, introduce students to a major research project that integrates elements of physical and human geography, and cultivate knowledge of future professional development. Graduate students may take this course by permission only.

*Prerequisite:* Nine hours in Geography and status as a senior major in the department, or permission of the instructor.

**GEOG 510 Human Factors.** (4)

An introduction to the concepts and theories underlying the study of human-technological systems. Human-machine interfaces and system properties, and the environment are considered. Lecture-discussion sessions are supplemented by computer-supported laboratory and research activities.

**GEOG 511 Intermediate Cartography:** \_\_\_\_\_ (Selected topic to be specified). (1-6)

An investigation of special topics in cartography. Can be repeated for different topics.

*Prerequisite:* A course in cartography and consent of the instructor.

**GEOG 513 Cartographic Design.** (3)

A study of graphic elements and their role in the physical and perceptual structure of the map image. Concepts and principles of design are stressed with particular emphasis on the figure-ground relationships, color and lettering.

*Prerequisite:* GEOG 311.

**GEOG 514 Visualizing Spatial Data.** (4)

Students use Visual Basic or other currently prominent programming language to visualize spatial data. Early projects cover basic principles such as color manipulation and spatial transformations. Later projects involve developing more sophisticated software for data presentation, data exploration, and map animation.

*Prerequisite:* Some experience with Visual Basic or other programming language.

**GEOG 516 Applied multivariate Analysis in Geography.** (3)

An introduction to the application of multivariate statistical analysis in geography. Techniques covered include univariate and multivariate analysis of variance, multiple regression, logistic

regression, principle components analysis, and spatial regression. Practical applications of the techniques in a geographical research context are emphasized. Students will learn how to use statistical packages such as SPSS. *Prerequisite:* GEOG 316 or equivalent.

**GEOG 517 Data Handling and Map Symbolization.** (3)

An analysis of methods for manipulating and symbolizing spatial data. Techniques studied include dot, choropleth, proportional symbol, and isarithmic (contour) mapping. Topics covered include data classification, and the use of color, and automated methods of interpolation (triangulation, inverse distance, and kriging). Emphasis is on developing maps that can be presented to the general public, although some consideration is given to visualization software that can be utilized by individuals to explore spatial data.

*Prerequisite:* GEOG 111 or GEOG 210 or GEOG 311.

**GEOG 519 History of Cartography.** (3)

Same as HIST 546

A history of mapmaking worldwide from its origins to the present day; emphasis on maps as historical records of evolving civilizations and cultural landscapes; methods of studying early maps.

**GEOG 521 Microclimatology.** (3)

Same as ATMO 521

A study of climatic environments near the earth-atmosphere interface. Consideration of rural climates in relation to agriculture and urban climates as influenced by air pollution and other factors. Emphasis is on physical processes in the lower atmosphere, distribution of atmospheric variables, the surface energy budget and water balance.

*Prerequisite:* ATMO 105 and Math 106 or Math 121.

**GEOG 526 Remote Sensing of Environment I.** (4)

Same as EVRN 526

Introduction to study of the environment through air photos and satellite imagery, including principles of remote sensing, interactions of electromagnetic energy with the atmosphere and earth's surface, aerial photography, satellite systems, and sensors (electro-optical, thermal, and radar). Emphasis in the latter part of the course is on such applications as global monitoring, land cover mapping, forestry, agriculture, and oceanography. Laboratory emphasizes visual interpretation of aerial photography and satellite imagery and an introduction to digital image processing in the department's NASA Earth Science Remote Sensing Laboratory.

*Prerequisite:* basic algebra. GEOG 358 recommended.

**GEOG 531 Topics in Physical Geography:** \_\_\_\_\_ (1-3)

An investigation of special topics in physical geography. May include specific coursework under the headings of geomorphology, climatology, soils, vegetation, quaternary, paleoenvironments, hydrology, etc. May be repeated if topic differs.

**GEOG 532 Geoarchaeology.** (3)

Same as ANTH 517

Application of the concepts and methods of the geosciences to interpretation of the archaeological record. The course will focus primarily on the field aspects of geoarchaeology (e.g., stratigraphy, site formation processes, and landscape reconstruction), and to a lesser extent on the array of laboratory approaches available.

*Prerequisite:* GEOG 104, ANTH 110, or 310.

**GEOG 535 Soil Geography.** (5)

Same as EVRN 535

A broad study of the principles and properties of soils and their distribution on the landscape. Topics covered include: pedology, clay mineralogy, soil physics, soil chemistry, management of soils, soil biology, taxonomy, and soil geomorphology. Laboratory section and a field project are required. Not open to students who have taken GEOG 335.

*Prerequisite:* GEOG 104 or GEOL 101 or consent of the

instructor; BIOL 104 and CHEM 184 or 185 recommended.

**GEOG 537 Elements of Plant Geography. (3)**

An introduction to spatial and temporal variation in natural plant populations and communities. Included is an introduction to methods of analysis and an overview of structure and process in the earth's major biomes.

*Prerequisite:* GEOG 331, or an introductory biology/botany course and GEOG 104; or consent of instructor.

**GEOG 538 Environmental Soil Physics and Chemistry. (4)**  
Same as EVRN 538

This course examines the physical and chemical properties of soils and methods of evaluation. Physical topics include the movement of water, heat, gases, and solutes through soil. Chemistry topics include solid and solution speciation, mineral solubility, ion exchange, and oxidation-reduction reactions in soils.

*Prerequisites:* GEOG 335 or 535, CHEM 188 or 189, MATH 121, PHSX 114, or consent of the instructor.

**GEOG 541 Geomorphology. (4)**

Same as GEOL 541

A critical study of landforms in relation to tectonics, climatic environment, and geologic processes. The use of geomorphic methods in the interpretation of Cenozoic history is emphasized. Laboratory exercises in analysis of field observations, maps, and photographs. Required field trip and fee.

*Prerequisite:* GEOL 101 or GEOG 104 or 304.

**GEOG 550 Environmental Issues in Africa. (3)**

Same as AFS 551

Acquaints students with the complexities of debates on environmental problems in Sub-Saharan Africa. Topics addressed may include deforestation, desert expansion, wildlife conservation, soil erosion, climate change, coral reef destruction, water resources development, mangrove preservation, and the environmental effects of war, industrialization, and urbanization. Class presentations and projects synthesize the perspectives of both human and physical geography.

*Prerequisite:* GEOG 104 or permission of the instructor.

**GEOG 552 Topics in Urban/Economic Geography: \_\_\_\_\_**  
(Selected topic to be specified). (1-3)

An investigation of special topics in urban/economic geography. May include specific coursework under the headings of energy, economic development, international trade, environmental perception, housing, transportation, and migration. May be repeated if topic differs.

**GEOG 553 Geography of African Development. (3)**

Same as AFS 553

Acquaints students with the values and social parameters of African agricultural and pastoral practice. Topics include customary land rights, African perspectives on the natural world, gender issues in African agriculture, and the urbanization of African cultures. The course also contrasts African views with those of Western development practitioners and donor agencies. Case studies from different countries are used to highlight the continent's regional differences.

**GEOG 556 Geography of the Energy Crisis. (3)**

A discussion and analysis of the basic facts and causes of energy problems on a national and world scale. Examines current production, consumption, efficiency, reserves, conservation and other energy policy options, including adjustments that will affect consumer use, national politics and strategic issues.

*Prerequisites:* GEOG 102 or 375.

**GEOG 557 Cities and Development. (3)**

Same as AAAS 557

An intermediate level course in urban geography, with an emphasis on cities in the developing world. Example cities in Latin America and the Caribbean, Sub-Saharan Africa, the Middle East, South Asia, and/or Southeast Asia may be

examined. The main focus is on the intersection between urbanization and economic development, but social, political, and cultural aspects of development in cities are considered. Other topics include the geographical impacts of European colonialism, urbanization and industrialization, rural-to-urban migration, urban structure and spatial dynamics, urban planning and environmental sustainability.

**GEOG 558 Intermediate Geographical Information Systems (4)**

An intermediate level course in geographic information science designed for advanced undergraduate and graduate level students who already have an introductory understanding of GIS. Emphasis will be placed on the application of spatial analytical techniques to geographical problem-solving. Topics include spatial data structures, interpolation techniques, terrain analysis, cost surfaces and database management techniques. Students will apply knowledge gained in lecture and reading to natural resource, urban, and scientific applications using state-of-the-art GIS software.

*Prerequisite:* GEOG 358 or consent of instructor.

**GEOG 560 GIS Application Programming. (3)**

This course teaches programming within Geographic Information Systems. Students will learn how to customize GIS applications to automate data processing and spatial analysis through programming languages. GIS programming concepts and methods will be introduced from the aspects of spatial data management and analysis covering both vector and raster data models.

*Prerequisite:* GEOG 558 and a course in programming languages.

**GEOG 570 Geography of American Indians. (3)**

A survey of the culture and history of selected indigenous peoples of the Americas. Emphasis is placed on the environmental setting, the settlement and subsistence patterns, and the impact of European colonization. Discussion includes present-day ethnic and resource issues.

**GEOG 571 Topics in Cultural Geography: \_\_\_\_\_.** (1-3)

An investigation of special topics in cultural geography. May include specific coursework under the headings of cultural theory and methodology, material culture, foodways, religion, and similar topics. May be repeated if topic differs.

**GEOG 572 Political Geography. (3)**

Acquaints students with the theories and methods of political geography. Topics include geographical studies of: states, nations, and nationalism; territories and territoriality; geopolitics; and elections. Case studies from various regions of the world to be included, with an emphasis on the developing world.

*Prerequisite:* GEOG 102 or consent of instructor.

**GEOG 575 Geography of Population. (3)**

Describes and analyzes the distribution of human populations and spatial relations among and within varying types of settlements.

*Prerequisite:* GEOG 102 or 375.

**GEOG 576 Cultural Geography of the United States. (3)**

Same as AMS 576

Distributions of major culture elements including folk architecture, religion, dialect, foodways, and political behavior are systematically studied from a predominately historical perspective. These discussions are followed by a survey of the major culture regions in America.

*Prerequisites:* Although not absolutely necessary, familiarity with concepts treated in any of the following courses would be helpful: AMS 100, 110, ANTH 108, 308, GEOG 102, 390.

**GEOG 579 Geography of American Foodways. (3)**

Same as AMS 579

An interdisciplinary approach to food that explores the diversity of eating habits across the United States and the role of food as an indicator of cultural identity and change. Current regional and ethnic food consumption patterns are stressed. Topics include

multi-culturalism and regional identity, the symbiotic relationship between restaurant food and home cooking, the recent interest in farmers' markets and organic foods, and the importance of the food industry and the popular press in setting trends.

**GEOG 591 Geography of Latin America. (3)**

A study of the different physical, economic, and cultural settings in Latin America which form the basis for the various forms of livelihood.

**GEOG 592 Middle American Geography. (3)**

This regional study of the natural environments and cultural-historical backgrounds of Mexico, Central America, and the Caribbean details the physical and historical processes that have shaped the cultural landscape.

**GEOG 593 Central American Peoples and Lands. (3)**

This is a study of the natural and cultural history of the region's lands and peoples that focuses on the cultural geography of the surviving indigenous populations, including their culture area, culture history, cultural landscape, and cultural ecology.

**GEOG 594 Geography of the Former Soviet Union. (3)**

An analysis of the spatial organization of the successor states to the USSR. A study of the diverse human and natural resources, demographic, cultural and economic conditions.

*Prerequisite:* An introductory geography course or background in Russian-East European history, social science, or culture or consent of instructor.

**GEOG 595 Geography of Eastern Europe. (3)**

A study of nations and regions of Eastern Europe, excluding Russia. *Prerequisite:* An introductory geography course or background in Slavic-East European history, social science, or culture or consent of the instructor.

**GEOG 597 Geography of Brazil. (3)**

Study of geographic factors, physical and cultural, that are basic to understanding the historical development of Portuguese South America and the contemporary and cultural geography of Brazil. Course also includes a survey of Brazil's South American neighbors.

**GEOG 601 Indigenous Peoples of the World. (3)**

Same as GINS 601

A survey of the varied responses of global Indigenous peoples as a result of the imposition of externally-dominated economic and political systems. An overview of diverse, thematic issues such as land rights, economic development, resources and cultural patrimony, languages, knowledge systems, and women's rights from the perspectives of Indigenous societies around the world. Detailed studies of Indigenous peoples seeking recognition and protection under international law will be used.

**GEOG 658 Topics in Geographic Information**

**Science:** \_\_\_\_\_. (1-6)

An investigation of special topics in geographic information science. May include specific coursework under the headings of methodology, basic research, thematic or regional applications, geographic information systems (GIS), Global Positioning System (GPS), and geostatistics. May be repeated if topic differs.

*Prerequisite:* Vary by topic.

**GEOG 670 Cultural Ecology. (3)**

Same as ANTH 695

Investigation of the interrelations between socio-cultural systems and the natural environment, including a survey of major theories and descriptive studies.

*Prerequisite:* An introductory course in Geography or Anthropology.

**GEOG 710 Information Design. (3)**

Concepts and principles for the organization of verbal, numerical and graphic/spatial data and their application to the production of information displays and instruments. Examination of the

evolution of the information design process from the traditional (communication system) perspective to interactive user-centered design approaches. The nature of human information processing in handling information for both visualization and analysis, with particular emphasis on decision-making and usability.

*Prerequisites:* GEOG 510, INDD 510, PSYC 318, PSYC 685 or equivalent, or consent of the instructor.

**GEOG 711 Advanced Cartography: \_\_\_\_\_ (3)**

An investigation of special topics in cartography. Can be repeated for different topics.

*Prerequisite:* Consent of the instructor.

**GEOG 713 Practicum in Cartography. (1-6)**

Experience in the organization and presentation of cartographic material in lecture, discussion and laboratory formats. May be repeated to a total of six credits.

*Prerequisite:* Consent of the instructor.

**GEOG 714 Field Experience. (3)**

Working in a new environment presents problems unlike those encountered in a classroom situation. Data collection techniques and exercises discussed in this off-campus course are intended to provide experience in dealing with an unfamiliar situation. Course location is dictated by the interests and composition of the student group; offered in the first three weeks of August.

Geography majors are encouraged to attend. This course is required for graduate students. Fee required.

*Prerequisites:* Junior-Senior standing and 15 hours of geography or instructor's consent.

**GEOG 716 Advanced Geostatistics. (3)**

An introduction to the practical application of advanced geospatial statistical techniques. Potential topics include: spatial regression, interpolation, clustering and advanced non-parametric statistics. Knowledge of a statistical package and GIS is assumed.

*Prerequisite:* GEOG 516 or equivalent and GEOG 358 or equivalent.

**GEOG 719 Development of Geographic Thought. (2-3)**

Critical analysis of the growth of geographic thought from antiquity to the present: Emphasis is on the structure of modern geography.

*Prerequisite:* 20 hours of geography, or consent of the instructor.

**GEOG 726 Remote Sensing of Environment II. (4)**

An overview of techniques for computer analysis of digital data from earth orbiting satellites for environmental applications.

Topics covered include: data formats, image enhancements and analysis, classification, thematic mapping, and environmental change detection. The laboratory exercises provide hands-on experience in computer digital image processing in the

department's NASA Earth Science Remote Sensing Laboratory.

*Prerequisite:* Introductory statistics and GEOG 526 or equivalent.

**GEOG 731 Topics in Physical Geography: \_\_\_\_\_ (1-3)**

An investigation of special topics in physical geography. May include specific coursework under the headings of geomorphology, climatology, soils, vegetation, quaternary, paleoenvironments, hydrology, etc. May be repeated if topic differs.

**GEOG 733 Advanced Biogeography Field and Laboratory Techniques. (3)**

This course provides graduate students with practical experience in field data collection techniques and laboratory data analysis methods. During the first half of the semester, students will work in the field using a variety of methods to measure such vegetation characteristics as: cover, density, biomass, leaf area, and canopy architecture. Students will gain experience in the use of field instruments including a spectroradiometer, and techniques for quantifying vegetation biophysical attributes. The laboratory analyses component will include: data summary, data

entry, correlation, regression, MANOVA, cluster analysis, and data display and reporting.

*Prerequisites:* GEOG 516 or multivariate statistics equivalent recommended.

**GEOG 735 Soil Geomorphology.** (3)

Examines the interaction of pedogenic and geomorphic processes during the Quaternary with an emphasis on strategies and methodologies employed in soil-geomorphic studies. Group research projects incorporating field data collection and analyses are required.

*Prerequisite:* GEOG 335 or 535 or consent of the instructor.

**GEOG 749 Topics in Stable Isotopes in the Natural Sciences** (2-3)

Same as BIOL 749

Isotopic compositions of substances provide powerful insights into many topics in the natural sciences. Applications of isotopic analyses of carbon, hydrogen, oxygen, and nitrogen to selected research topics such as plant resource use, food web analysis, paleoecology, paleodiet reconstruction, hydrology, and soils genesis will be examined.

*Prerequisite:* Knowledge of isotope chemistry is not required. (Concepts necessary to understand pertinent articles will be taught during the first class meetings.) May be repeated.

**GEOG 752 Topics in Urban/Economic Geography:** \_\_\_\_\_

(Selected topic to be specified). (1-3)

An investigation of special topics in urban/economic geography. May include specific coursework under the headings of energy, economic development, international trade, environmental perception, housing, transportation, and migration. May be repeated if topic differs.

**GEOG 758 Geographic Information Science.** (4)

This course integrates topics in geographical information science (GISci) with spatial analytical techniques to solve spatial problems. Focuses on the most current research in GISci and its relevance to the environmental sciences, natural resource management, and spatial decision-making. Students are expected to apply the concepts and techniques learned in this class to their own research projects.

*Prerequisites:* GEOG 558 and GEOG 316, or consent of instructor.

**GEOG 771 Topics in Cultural Geography :** \_\_\_\_\_ (1-3)

An investigation of special topics in cultural geography. May include specific course methodology, material culture, foodways, religion, and similar topics. May be repeated if topic differs.

**GEOG 772 Problems in Political Geography.** (3)

Case studies of regional and national power settings with particular emphasis upon the geographical analysis of political developments in unstable areas of the world.

*Prerequisites:* GEOG 102 or GEOG 375.

**GEOG 790 North American Regions:** \_\_\_\_\_ (Selected areas to be specified). (3)

A detailed description and analysis of selected regions of North America.

*Prerequisite:* An introductory geography course or background in United States or Canadian history, social science, or culture or consent of the instructor.

**GEOG 791 Latin American Regions:** \_\_\_\_\_ (3)

A description and analysis of the principal sources of geographic information pertaining to portions or all of Latin America.

*Prerequisite:* GEOG 591, or concurrent auditing of 591, or consent of the instructor.

**GEOG 794 Regions of the former USSR.** (3)

A description and analysis of geographic data pertaining to the successor states of the USSR.

*Prerequisite:* Fifteen hours of Geography courses or background in Russian, East European or Middle East studies, or consent of

the instructor.

**GEOG 795 European Regions:** \_\_\_\_\_ (3)

*Prerequisite:* Fifteen hours in Geography, background in specified region, or consent of instructor.

**GEOG 796 Asian Regions:** \_\_\_\_\_ (2-3)

*Prerequisite:* Fifteen hours in Geography, background in Asia, or consent of instructor.

**GEOG 801 Indigenous Peoples of the World.** (3)

Same as GINS 801

A survey of the varied responses of global Indigenous peoples as a result of the imposition of externally-dominated economic and political systems. An overview of diverse, thematic issues such as land rights, economic development, resources and cultural patrimony, languages, knowledge systems, and women's rights from the perspectives of Indigenous societies around the world. Detailed studies of Indigenous peoples seeking recognition and protection under international law will be used.

**GEOG 805 History of Geographic Thought.** (2)

A course to familiarize students with the history and philosophy of geography as a science and humanity. The course summarizes, reviews, and explores the ongoing relevance of 2,500 years of theoretical and methodological advancements in human and physical geography. It is required of all M.A. students and is required for Ph.D. students if lacking in previous curricula.

**GEOG 806 Basic Seminar.** (2)

The second of two courses required of M.A. students designed to provide experience in the development of research proposals and exposure to methodologies in geography. This course deals with approaches to geographic problems, and involves individual examination of special topics which require preparation, presentation and critical evaluation of research proposals.

**GEOG 818 Problems in Production Cartography.** (1-3)

Advanced instruction in the theory and practice of producing maps and other related graphics for classroom instruction and research projects. Emphasis will be on current photomechanical and automated techniques.

*Prerequisite:* consent of instructor.

**GEOG 858 Environmental Geographic Information Systems.** (4)

An introduction to the use of GIS for environmental inventory, monitoring and modeling. This course integrates the principles of landscape ecology with the analytical tools of GIS, remote sensing and spatial analysis. Students will be taught GIS methodologies used to address real world problems and the use of GIS spatial analysis techniques to characterize landscapes and monitor their change.

*Prerequisite:* GEOG 316 and GEOG 558 or equivalents, multivariate analysis recommended.

**GEOG 890 Geographic Internship.** (1-6)

Supervised professional experience. The student submits to the program committee a proposal describing the internship prior to enrollment. Upon acceptance, regularly scheduled meetings with the advisor provide assistance, guidance and evaluation of progress in the professional experience. A written summary of the experience or outcomes of the research project are prepared independently by the student, a representative of the host agency, and the advisor. Total credit not to exceed six hours. *Prerequisite:* 12 hours of graduate level geography courses and consent of program committee.

**GEOG 898 Readings in Geography.** (1-4)

**GEOG 899 Master's Thesis.** (1-10)

**GEOG 911 Seminar in Cartography:** \_\_\_\_\_ (Selected topic to be specified). (1-4)

Study of selected topics in cartography. May be repeated if topic differs.

*Prerequisite:* GEOG 513 or consent of instructor.

**GEOG 912 Seminar in Quantitative Methods. (2-3)**

**GEOG 926 Seminar in Remote Sensing. (2-4)**

Study of selected topics in remote sensing theory and application. May include independent or group research and/or development work. Topics will be specified in advance.

*Prerequisite:* GEOG 726 or consent of the instructor.

**GEOG 935 Seminar in Soil Geography. (2-3)**

Subject matter varies but focuses on modern concepts and trends in soil geography. Sample topics include classification, paleopedology, and soil genesis. Field trip may be required.

*Prerequisite:* GEOG 735 or consent of the instructor.

**GEOG 958 Seminar in Geographic Information Systems. (2-4)**

Study of selected topics in analysis of digital geographic data. May include research and/or developmental work.

*Prerequisite:* GEOG 758 or equivalent, or consent of the instructor.

**GEOG 970 Seminar in Cultural Geography. (2-3)**

Study of selected topics in the theory and method of cultural geography. Samples include religious patterns, folk architecture, and place-defining novels. Topics will be specified in advance.

**GEOG 972 Seminar in Political Geography. (2-3)**

Study of selected topics in the theory and method of political geography. Samples include insurgent states, electoral patterns, and political ecology. Topic will be specified in advance.

*Prerequisite:* GEOG 772 or consent of instructor.

**GEOG 980 Seminar in Geography: \_\_\_\_\_**

(1-3)

**GEOG 990 Seminar in Regional Geography: \_\_\_\_\_**

(Selected areas to be specified). (1-3)

**GEOG 998 Research in Geography. (1-5)**

**GEOG 999 Doctoral Dissertation. (1-10)**

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