

**A. Undergraduate Courses.**

**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.

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

**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.

**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.

**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.

- 105 INTRODUCTION 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.
- 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. Open only to students in the College Honors Program or by consent of the instructor.
- 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, to 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.
- 148 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.
- 149 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. An honors section of Geog 148, designed for superior students. Membership in the University Honors Program or approval of instructor required.
- 150 ENVIRONMENT AND SOCIETY. (3)  
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.
- 158 GIS IN SCIENCE AND SOCIETY. (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.

210 COMPUTERS, MAPS, AND GEOGRAPHICAL 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).

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.

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.

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.

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.

321 CLIMATE AND CLIMATE CHANGE. (3) (Same as ATMOS 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. Prerequisites: GEOG 104 or ATMOS 105.

**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.

**332 GLACIERS AND LANDSCAPE. (3)**

Interdisciplinary examination of the interactions between glaciers and their natural environments, bringing together elements from glaciology, geology, and climatology. Students learn how evidence for environmental change can be gathered from existing glacier ice, geomorphology, and the geologic record. An understanding of how glaciers respond to environmental changes is developed to fully employ the glacier record for paleoclimate reconstruction in addition to understanding the limitations of such reconstructions. Topics discussed include processes involved in forming glacier ice, the nature of the relationships between glaciers and climate, the mechanisms of glacier flow, and interpretation of the Earth's glacial record. Prerequisites are one of the following: GEOG 104, GEOL 101, or consent of instructor.

**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

**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.

**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.

- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.

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.

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.

399 TOPICS IN REGIONAL STUDIES: \_\_\_\_\_. (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.

410 HUMAN BIOGEOGRAPHY, HONORS (3) 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.

418 INTERNSHIP IN PRODUCTION CARTOGRAPHY. (1-3)

Theory and practice of producing maps and other related graphics using photo-mechanical and automated techniques. Involves a weekly consultation session and laboratory time in KU Cartographic Service. Prerequisite: Completion of GEOG 311 with a grade of B or better and consent of instructor.

433 BIOGEOGRAPHY FIELD AND LABORATORY TECHNIQUES. (3) Same as EVRN 433

This course provides undergraduate students with practical experience in field datacollection 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.

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.

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

498 SPECIAL TOPICS IN GEOGRAPHY. (1-5)  
Prerequisite: 15 hours of geography.

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.

B. Undergraduate and Graduate Courses

510 HUMAN FACTORS. (4) (Same as INDD 510)  
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.

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.

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 or 717. Laboratory fee and deposit required.

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.

515 BEHAVIORAL SYSTEMS. (3)  
An introductory course in behavioral geography. Examines the development of spatial cognitions (acquisition, organization and use of environmental knowledge),

and spatial patterns of behavior based on those cognitions at scales ranging from personal space to world views.

- 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.
- 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.
- 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.
- 521 MICROCLIMATOLOGY. (3) (Same as ATMO 521)  
A study of climatic environments near the earth-atmosphere interface. The course considers rural climates in relationship 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.
- 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.
- 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.

- 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 formational processes, and landscape reconstruction), and to a lesser extent on the array of laboratory approaches available. Prerequisite: GEOG 104, ANTH 110, or 310.
- 535 INTRODUCTION TO SOIL GEOGRAPHY. (4)  
This course focuses on the physical and chemical properties of soils. The student is introduced to the importance of clay minerals and organic content among other soil properties as they affect soil use and variability in a geographic context. Field trips and laboratory section required. Prerequisite: GEOG 104 or GEOG 331 or GEOL 101 or BIOL 104 or consent of the instructor.
- 536 LANDSCAPE ECOLOGY. (3) N  
Landscape ecology is the study of spatial variation in landscapes at a variety of scales. It includes the biophysical and societal causes and consequences of landscape heterogeneity, linking natural sciences with related human disciplines. Its core themes address the spatial pattern of landscapes; relationships between pattern and process in landscapes; relationships between human activity and landscape pattern, process and change; and the effect of disturbances on the landscape. Prerequisite: GEOG 104 or GEOG 148 or EVRN 148 or BIOL 104, or consent of instructor.
- 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.
- 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.
- 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.
- 551 INTERMEDIATE ECONOMIC GEOGRAPHY. (3)  
A lecture course dealing with the principles of location theory, resource utilization and regional specialization of economic activities. Economic concepts, such as

rent payment for agricultural and mineral resources, scale and agglomeration economies, etc., are applied to various physical, demographic and cultural settings of major world regions. Special emphasis is placed on the basic principles of and recent changes in patterns of world trade, international investment, and economic development. Prerequisite: GEOG 375 or introductory economics or consent of instructor.

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.

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.

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.

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.

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.

- 560 GIS APPLICATION PROGRAMMING. (3)  
This course teaches programming GIS. Students will learn how to customize GIS applications to automate data processing and spatial analysis through high-level programming languages. GIS programming concepts and methods will be introduced from the aspects of spatial data management and analysis covering both the vector and raster data models. The prerequisites for the course are GEOG 558 and a course in programming languages.
- 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.
- 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.
- 572 POLITICAL GEOGRAPHY. (3)  
Acquaints students with the theories and methods of political geography. Topics include geographical studies of: states, nations, and nationalism; territorially; geopolitics; and elections. Case studies from various regions of the world to be included, with an emphasis on the developing world.
- 573 ADVANCED GEOGRAPHIC ANALYSIS. (3)  
A course designed to teach students how to define, gather, process, evaluate and present geographic research. Its emphasis is field work and original data gathering versus library research. Prerequisite: previous coursework in geography and/or consent of the instructor.
- 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.
- 576 CULTURAL GEOGRAPHY OF THE UNITED STATES. (3) (Same as AM S 770)  
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. Although not absolutely necessary, familiarity with concepts treated in any of the following courses would be helpful: AM S 100, 110, ANTH 108, 308, GEOG 102, 390.
- 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.

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.

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.

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.

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.

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.

596 GEOGRAPHY OF CHINA. (3)

A detailed description and analysis of geographic patterns in both historic and modern China. Prerequisite: An introductory geography course or background in Chinese history, social science, or culture or consent of the instructor.

597 GEOGRAPHY OF BRAZIL (3)

Study of geological 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.

657 GEOGRAPHIC MODELS. (3)

Examination of several methodologies and specific techniques from geographical and operations research having proven applicability to public facility location decisions. The course emphasizes "hands-on" student experience with canned computer programs and real world problems. Prerequisite: An introductory course in urban planning or transportation geography or urban geography or consent of the instructor.

- 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.
- 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.
- 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.
- 711 ADVANCED CARTOGRAPHY: \_\_\_\_\_. (3)  
An investigation of special topics in cartography. Can be repeated for different topics. Prerequisite: Consent of the instructor.
- 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.
- 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.

#### **Characteristics of Geog 714 (Field Experience)**

The basic characteristics of Geog 714 are listed below.

1. Approximately three weeks of fieldwork in an environment unfamiliar to the student.
2. Extensive on-site instruction from at least two professors.
3. A course content that includes both human and physical geography along with

geography techniques (e.g., interviews and GPS), and that addresses the means to attack and solve geographical problems.

4. Stresses a team approach to problem solving.

Any student who wishes to propose alternate work (or document previous experience) as a substitute for 714 should petition the Graduate Studies Committee (GSC), and provide a detailed plan for that work. GSC must approve this plan before the work can be substituted for Geog 714. Upon completion of the work, students must prepare a 10-page report summarizing the content of the substituted activities for approval by SAC.

One alternative to 714 is to take a similar course at another college or university.

Any questions to Field Experience class should be directed to the department's director of graduate studies.

716 ADVANCED GEOSTATISTICS. (3)

An introduction to the practical application of advanced geo-spatial 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.

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.

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.

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.

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. Recommended: GEOG 516 or multivariate statistics equivalent.

**735 SOIL GENESIS, CLASSIFICATION AND DISTRIBUTION. (3)**

An analysis of the origin, classification and distribution of major soil groups of the world. Field trips required. Prerequisite: GEOG 535 or consent of the instructor.

**741 ADVANCED GEOMORPHOLOGY. (1-3) (Same as GEOL 741)**

Detailed discussions of processes and landforms characteristic of specific environments. Considered during separate semesters will be general methodology, and fluvial, arid regions, glacial, and shoreline geomorphology. Course may be taken more than once. Prerequisite: GEOG 541.

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

**751 ANALYSIS OF REGIONAL DEVELOPMENT. (3)**

An analytical approach to spatial organization of economic activities and aspects of growth and development. An emphasis is given to location theory and the geography of trade and migration. A research paper is required. Prerequisite: GEOG 551, or a course in economics, or consent of the instructor.

**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.

**756 ENERGY PROBLEMS AND THE ECONOMIC-PHYSICAL ENVIRONMENT. (2-3)**

This course investigates the economic, social, political, and environmental conditions of energy production, transport and use: total energy consumption and mix, relations to the level and structure of the economy, substitutability of fuel and energy sources, resource endowment in an international setting. Prerequisite: GEOG 551, or a course in economics, or consent of the instructor.

**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.

- 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.
- 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.
- 773 HUMANISTIC GEOGRAPHY. (3)  
A discussion and project-oriented course focused on ways of studying the character and meaning of places. Concepts examined include place image and image makers, landscapes as text, sense of place, vernacular regions, and alternate representations of space. Prerequisite: Graduate standing or fifteen hours of geography or consent of instructor.
- 775 PROSEMINAR IN POPULATION GEOGRAPHY. (3)  
Evaluation of problem formulation, data gathering, research methods and substantive knowledge in the geography of human populations. Concurrent auditing of GEOG 575 plus an additional meeting each week is required. Prerequisites: GEOG 575 and 516, and SOC 514.
- 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.
- 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.
- 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.
- 795 EUROPEAN REGIONS: \_\_\_\_\_. (3)  
Prerequisite: Fifteen hours in Geography, background in specified region, or consent of instructor.
- 796 ASIAN REGIONS: \_\_\_\_\_. (2-3)  
Prerequisite: Fifteen hours in Geography, background in Asia, or consent of instructor.

**C. Graduate Courses Only.**

- 802 URBAN GEOGRAPHIC INFORMATION SYSTEMS. (3) (Same as UBPL 802)  
 An advanced survey of GIS/LIS focusing on: (1) history; (2) the wide range of applications from Automated Mapping/Facilities Management (AM/FM) to topologically related GIS; (3) generic analytical functions in both raster and vector modalities; and (4) software employed, hardware platforms and institutional settings. A limited experience in the use of GIS is provided from exercises employing Arc/Info software. Prerequisite: Some experience with DOS based computing.
- 805 INTRODUCTION TO GRADUATE STUDY. (2)  
 A course required of all M.A. candidates to introduce geography as a research discipline. The course focuses on writing and editing, library materials, and the history and philosophy of the discipline.
- 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.
- 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.
- 835 PRACTICUM IN SOIL MAPPING AND SOIL EROSION. (3)  
 This course is designed to give graduate students field experience in soil mapping and in the evaluation of soils for loss through processes of erosion. Prerequisite: GEOG 535 or equivalent, or consent of the instructor.
- 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.
- 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.

- 898 READINGS IN GEOGRAPHY. (1-4)
- 899 MASTER'S THESIS. (1-10)
- 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 and 717, or consent of instructor.
- 912 SEMINAR IN QUANTITATIVE METHODS. (2-3)
- 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. Topic will be specified in advance.  
 Prerequisite: GEOG 726 or consent of the instructor.
- 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.
- 937 SEMINAR IN VEGETATION GEOGRAPHY. (1-3) (Same as BIOL 968)
- 939 SEMINAR IN FLUVIAL SYSTEMS. (2-3)  
 Study of selected topics in theory and method of fluvial systems. Samples include hydraulic geometry, the nature of alluvial sediments, and basin case studies. Topic will be specified in advance. Prerequisite: GEOG 739 or consent of instructor.
- 957 SEMINAR IN URBAN AND ECONOMIC GEOGRAPHY. (2-3)
- 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.
- 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. Topic will be specified in advance. Prerequisite: GEOG 770 or consent of instructor.
- 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.
- 975 SEMINAR IN POPULATION GEOGRAPHY. (2-3)

Study of selected geographic topics and problems dealing with the distribution of human populations. Prerequisite: GEOG 775 or consent of instructor.

980 SEMINAR IN GEOGRAPHY: \_\_\_\_\_. (1-3)

990 SEMINAR IN REGIONAL GEOGRAPHY: \_\_\_\_\_ (Selected areas to be specified). (1-3)

998 RESEARCH IN GEOGRAPHY. (1-5)

999 DOCTORAL DISSERTATION. (1-10)