



Graduate Study in Geography

KU THE UNIVERSITY OF
KANSAS

INSTRUCTIONS FOR SUBMISSION OF GRADUATE STUDENT APPLICATIONS

At the University of Kansas, a single application form covers admission and financial aid. The items listed below must all be received before the department can make an evaluation and admit a new student to the program. Those who wish to enter in the fall semester and to be considered for a fellowship or teaching assistantship must submit all materials by *January 15*. Applications for admission only should be submitted no later than June 1 for the fall term (international student deadline May 1), November 1 for the spring term (international student deadline October 1), or April 1 for the summer session (international student deadline February 15).

The following items must be received to complete the application file:

Items 1, 2, and 3 should be sent to: Graduate Applications Processing Center, 1450 Jayhawk Blvd., Room 313, University of Kansas, Lawrence, KS 66045-7535.

1. A completed Application Form. To apply on-line or print an application form, see the website at www.ku.edu/~graduate/.
2. A Statement of Interest and Goals. This is the last page of the on-line application form, or please attach to the paper application. The Graduate Studies Committee places considerable importance on the thoughtfulness of your remarks – in particular, we are interested in learning about (1) your specific interests within geography and why they are important and interesting to you, (2) what you envision as your educational and career objectives and how a degree from KU Geography helps to meet those objectives, and (3) which of our faculty members you think would be an appropriate graduate advisor and mentor.
3. The required application fee.

Items 4 through 6 should be sent to: Geography Department, 1475 Jayhawk Blvd., Room 213, University of Kansas, Lawrence, KS 66045-7613.

4. One official copy of the transcript where the undergraduate degree was confirmed, and one official copy of the transcript where any graduate degree/credit was earned (if applicable). If courses are in progress, please inform us as to department/program, course number, and title. Unofficial transcripts can be uploaded at the time of application.
5. Graduate Record Examination (GRE) scores. All students applying for admission must submit official GRE scores. For information regarding test centers and dates for examinations, see the website of the Educational Testing Service at www.ets.org or the Information Bulletin for the GRE Program available at any university's counseling office. You also may write the Educational Testing Service at P.O. Box 6000, Princeton, New Jersey 08541-6000.
6. Three confidential letters of recommendation sent by referees who are familiar with your academic and/or professional activities and who can address your likelihood of success in graduate school. If possible, we prefer letters from professors, but applicants returning to school after a lengthy absence may substitute letters from supervisors. Note

that it is the responsibility of the applicant to request and to confirm that the required letters have been sent by the deadline. When using the on-line reference form to list references, you must include valid e-mail addresses. Once you have completed and submitted your application, your references will be contacted directly via email with directions for submitting their letters of recommendation.

We hope that most of your inquiries will be answered by the enclosed materials. If you have additional questions, please contact the Graduate Studies Committee or a member of the departmental faculty in your area of professional interest.

ADDITIONAL REQUIREMENTS FOR INTERNATIONAL STUDENTS

1. Completion of the Test of English as a Foreign Language (TOEFL) examination or other evidence of English proficiency.
2. Completion of the Financial Resources section on the international graduate student application including the necessary documentation.
3. In addition, the Test of Spoken English (TSE) and a telephone or personal interview are required before a non-native English speaker can be offered a teaching assistantship. The minimum acceptable score on the TSE is 50

**GEOGRAPHY FACULTY
2010-11**

The members of the staff, their major specialties, and current research interests are as follows:

DAVID A. BRAATEN (Professor): Atmospheric science, remote sensing, climate change. Research on polar ice-sheet characteristics and snow-accumulation processes.

J. CHRISTOPHER BROWN (Associate Professor): Political ecology, biogeography, tropical environments, Latin America. Research on issues of sustainability in the Amazon.

NATHANIEL A. BRUNSELL (Associate Professor): Land-atmosphere interactions, remote sensing, micrometeorology. Research on the spatial and temporal variability of water, carbon, and energy cycling.

SO-MIN CHEONG (Assistant Professor): Economic, sustainable resources, East Asia. Research on the integration of science and policy.

JEROME E. DOBSON (Professor): Geographic information science, cultural geography. Research on the integration of remote sensing, geographical information science, and geography.

STEPHEN L. EGBERT (Associate Professor): Remote sensing, geographic information science. Research in phenologically based land-cover mapping and change-detection strategies using multitemporal satellite imagery.

JOHANNES J. FEDDEMA (Professor): Climatology, water resources, geographic information science. Research on global climate change, African water issues, and watershed modeling.

PETER H. HERLIHY (Associate Professor): Cultural and historical geography, Latin America. Research on indigenous peoples, conservation, and participatory mapping in Central America.

DANIEL R. HIRMAS (Assistant Professor): Pedology, soil geomorphology, soil mineralogy. Research on soil-landscape relationships, biogeochemical cycling of desert soils, and pedogenic modeling.

JAY T. JOHNSON (Assistant Professor): Cultural geography, comparative Indigenous Nations studies, post-colonialism. Research on Indigenous peoples' self-determination, Indigenous peoples' knowledge systems and the philosophies and politics of place.

WILLIAM C. JOHNSON (Professor): Fluvial geomorphology, geoarchaeology, palynology. Research on historic and prehistoric changes in river systems and Late Quaternary environments.

XINGONG LI (Associate Professor): Geographic information science, spatial analysis. Research on computational methods for the analysis of spatial data.

GEORGE F. MCCLEARY, JR. (Associate Professor): Cartography, behavioral systems, human factors. Research on map design, map use, and cognitive mapping.

DAVID B. MECHEM (Assistant Professor): Physical meteorology, cloud and mesoscale dynamics. Research on cloud microphysics and dynamics, mesoscale processes, numerical modeling, and boundary layer clouds.

SHAWN M. MILRAD (Visiting Assistant Professor): Atmospheric science, synoptic meteorology, and weather forecasting. Research on extratropical transition of tropical cyclones, extreme precipitation, and predictability of high-impact events.

GARTH A. MYERS (Professor): Cultural and political geography, development, Sub-Saharan Africa. Research on urban and regional development in Eastern Africa, cultural studies, and social theory in geography.

SHANNON R. O'LEAR (Associate Professor): Cultural and political geography, environmental policy, Russia, the Caucasus and Central Asia. Research on resource conflict in Azerbaijan.

MARGARET W. PEARCE (Assistant Professor): Critical cartographies, historical geography, Indigenous geographies and map history. Research on representation of place in historical and Indigenous cartographic design.

JAMES R. SHORTRIDGE (Professor): Cultural and historical geography, United States. Research on regionalism and sense of place.

TERRY A. SLOCUM (Associate Professor): Cartography, geographic information science, Quantitative Methods. Research on visualization and animation.

DONNA F. TUCKER (Associate Professor): Atmospheric science. Research on numerical modeling and mesoscale precipitation systems.

KEES VAN DER VEEN (Professor): Glaciology, ice-climate interactions, global environmental change. Research on dynamics and mass balance of fast-moving ice streams and outlet glaciers in Greenland and Antarctica, remote sensing applications for glacial geomorphology.

BARNEY L. WARF (Professor): Economic geography, social theory, urban geography. Research on telecommunications, cyberspace, elections.

WILLIAM I. WOODS (Professor): Cultural ecology, historical, soils, Latin America. Research on Amazonian anthrosols.

AFFILIATED FACULTY:

STEVEN R. BOZARTH (Adjunct Assistant Professor): Paleoenvironmental reconstruction, phytolith analysis, landscape evolution.

ROBERT W. BUDDEMEIER (Courtesy Professor): Hydrologic systems, water resources, climate change.

MARK E. JAKUBAUSKAS (Courtesy Associate Professor): Remote sensing, geographic information science, biogeography.

KYLE E. JURACEK (Adjunct Assistant Professor): Hydrology, fluvial geomorphology, geographic information science.

ROLFE D. MANDEL (Courtesy Associate Professor): Soils, geoarcheology, quaternary environments.

EDWARD A. MARTINKO (Courtesy Professor): Remote sensing, environmental systems.

BARBARA G. SHORTRIDGE (Lecturer): Cultural and urban geography, gender issues, American foodways.

The department prides itself in having unusually close staff-student relationships both in and out of the classroom. An informal atmosphere for discussion is maintained whenever possible. The Geography Graduate Student Association acts as a sounding board for student concerns and as a mechanism for representation in departmental committees and faculty meetings. In addition, a more informal group called the Geoclub sponsors colloquia, picnics, coffee hours and similar activities.

FACILITIES

The department, located in Lindley Hall on the Lawrence campus, has a broad range of computing resources available for faculty and students. All classrooms and offices have internet access. Several classrooms are multimedia ready while instruction in others can be enhanced with portable LCD projectors.

Students have 24-hour access to departmental computing facilities. Lindley 310 contains twenty-three Dell Optiplex dual core systems installed with the Windows 7 enterprise operating system. Lindley 405, the Atmospheric Science program Meteorology and Climate Hub (MACH) contains two Dell Optiplex dual core systems installed with the Windows 7 enterprise operating system and ten quad core systems installed with RedHat Linux. Within Lindley 310, one system is a dedicated instructional workstation connected to the room's LCD projector while twenty-two systems are for general GIS and image-processing instruction with accessibility to large format scanners, color and black and white printers. The ten RedHat LINUX Dell quad core computers in the MACH lab are running meteorological software packages such as Integrated Data Viewer, GEMPAK and Mcldas. The two Windows systems available in the MACH lab are to assist student weather forecasting and prepare for university radio and television student weather reports. Black and white and color printers are also available in the MACH lab.

Other instructional classrooms for practicums in Atmospheric Science and Geography have dedicated Dell Optiplex or Dell Latitude systems installed with Windows 7 enterprise to compliment the document viewers and LCD projectors installed in the classrooms.

All Windows computers in the department labs are equipped with Office 2010, SPSS 18, ArcGIS 10, Imagine 2010, and ENVI 4.7x. Other supporting software within the labs may include Photoshop, Illustrator, and Freehand. Departmental computing facilities are

complemented by various university-sponsored labs around campus and cooperative arrangements with other academic departments: Environmental Studies, the Kansas Applied Remote Sensing program of the Kansas Geological Survey, and the Kansas Geological Survey.

In addition to computing facilities, the department has well-equipped laboratories for students working in traditional cartographic production, soils/geomorphology, palynology, and climatology/atmospheric science. The department has easy access to extensive map collections at the Spencer Research Library and the university map library.

GRADUATE PROGRAMS IN GEOGRAPHY

The department graduate program emphasizes physical geography, geographic information science (cartography-GIS-remote sensing), and cultural/regional studies. Each is well supported by faculty strength throughout the university and by appropriate laboratory and library facilities. Physical geography concentrations include atmospheric science/climatology, fluvial geomorphology and landscape evolution (both complemented by work in geology), plant geography, and soils. The geographic information science program is a highly interconnected unit that builds on pioneering work begun in cartography and remote sensing at Kansas in the 1950s under George Jenks and David Simonett, respectively. Current remote-sensing research emphasizes visual and digital analysis whereas the GIS program stresses computational methods of analysis and applications in natural resources; cartographers concentrate primarily on design, visualization, and interactive statistical mapping. The cultural/regional programs take advantage of Kansas's well-developed interdisciplinary language and area-studies centers for Africa, East Asia, Latin America, and Russia-East Europe. The last three of these officially are designated "National Resource Centers" by the U.S. Department of Education. The university's American Studies program and its T.R. Smith map collection are similarly regarded as among the best in the nation. Specific strengths within the cultural realm include political ecology, historical and humanistic geography, and development studies.

Overall supervision of the graduate program is the responsibility of the Graduate Studies Committee (GSC). This committee evaluates applications and makes recommendations to the department concerning admission and financial support of prospective students. It periodically reviews and evaluates each student's program and achievement and also approves specified stages in an individual's progress toward a graduate degree. Communication with the GSC is usually through written petition, although committee members will try to answer questions at any time.

M.A. PROGRAM AND PROCEDURES

Admission and Prior Work. Entering students are expected to have had previous work comparable to a minimal bachelor's degree in geography. More specifically, to attain full standing as an M.A. candidate, a person must have had a course or equivalent background in each of the following fields: physical geography, human geography, regional study, and geographic information science (e.g., cartography, quantitative methods, GIS, remote sensing, field methods). If the student needs to take formal coursework to make up a deficiency, these credit hours will not count toward the M.A. A deficiency may be removed

by 1) passing the specified course with at least a "C," 2) auditing the course and receiving a letter from the instructor indicating that the course requirements have been met, or 3) passing a written and/or oral examination comparable to the final exam.

Program and Course Requirements. The program at the M.A. level continues the general training of the bachelor's degree, but also provides for the development of some concentration in preparation for employment or further study. Students are also encouraged to take work outside the department to supplement and strengthen their programs, usually to a maximum of six hours. All candidates must pass an oral examination over their coursework and then submit and successfully defend a thesis in a final oral examination. The course requirements are as follows:

- General - One course in each of the following areas of study:
Geographic Information Science
Human Geography
Physical Geography
Regional Geography
- Required - 805 (Introduction to Graduate Study), 806 (Basic Seminar), and 714 (Field Experience). Students wanting to petition for an exemption or alternative to GEOG714 should examine the characteristics of the course, which are listed under the course description at the back of this booklet.
- Electives - at least three courses in an approved area of concentration. (Courses taken to meet the "general" requirement may not be double counted here.)
- Thesis - 1-6 hours

Total credit hours: a minimum of thirty

JOINT MASTER'S PROGRAM IN GEOGRAPHY AND URBAN PLANNING

This interdisciplinary program combines in three years the degrees of MA in geography and Master of Urban Planning. Details are available in a separate booklet available either online or from either of the two departments. Entering students should submit separate applications to each department. The joint degree entails 61 credit hours of coursework (39 in planning, 22 in geography) including a thesis.

PH.D. PROGRAM AND PROCEDURES

Prerequisites and Admission. Normally aspirants for the doctorate will have satisfied requirements comparable to the University of Kansas M.A. in geography, including the thesis. Students from other disciplines may find it necessary to eliminate deficiencies early in their program. Under special circumstances, students may proceed directly from the B.A.

to the Ph.D., but this is done only at the discretion of the department through approval by an advisor and the GSC.

Programs and Coursework. The doctoral program generally includes sixty hours of work beyond the M.A. of which eighteen to thirty hours will be satisfied by the dissertation. No specific credit-hour figure can be set for a doctoral degree because each program is designed on an individual basis. Of greater importance is the student's demonstrated competence in the selected area(s) of specialization. The program is comprised of formal courses, seminars, individual research and reading, and preparation of a dissertation. Although no "outside minor" is formally required of candidates, the department favors study in auxiliary departments.

Programs are planned with the advisor and then approved by the GSC. Such approval must be secured at latest by the second month of the second semester of study. Changes in the approved program can be initiated by the student at any time but must be approved by the advisor and the GSC.

Required Courses. Geography 714, Field Experience, is the only required course at the Ph.D. level. This three-week summer course is designed to familiarize the student with field techniques in both physical and human geography. Students wanting to petition for an exemption or alternative to GEOG714 should examine the characteristics of the course, which are listed under the course description at the back of this booklet.

An advisor, upon review of the student's record, may recommend Geography 805 and/or Geography 806 to an incoming Ph.D. student.

Major Areas of Study. The capabilities and interests of the department fall into four areas of study: geographic information science, physical, human, and regional geography. A student concentrating within one of these divisions will develop a program in consultation with professors in that area. This program usually will include work in other aspects of geography and related disciplines. A student also may develop a second concentration if he or she takes at least nine hours in that specialty and includes a professor from that second area on the committee for the comprehensive examination. This second area of concentration may lie outside of geography.

MAJOR AREAS OF STUDY FOR THE PH.D.

I. Geographic Information Science

Cartography	McCleary, Slocum, Pearce
Geographic Information Systems	Dobson, Egbert, Feddema, Li, Slocum
Remote Sensing	Braaten, Brunsell, Egbert

II. Physical Geography

Biogeography	Brown, W. Johnson
Climatology	Braaten, Brunsell, Feddema, Mechem, Tucker, van der Veen, Milrad

Geomorphology	W. Johnson, Hirmas
Pedology	Woods, Hirmas

III. Human Geography

Cultural	Herlihy, J. Johnson, Myers, O'Lear, Shortridge, Woods, Pearce
Historical	Herlihy, Shortridge, Woods, Pearce
Political	Myers, O'Lear, Warf
Regional Development	Brown, Cheong, Warf
Urban	Myers, Warf

IV. Regional Geography

Africa	Myers
East Asia	Cheong
Latin America	Brown, Herlihy, Woods
Russia and East Europe	O'Lear
United States	Shortridge
Oceania	J. Johnson

The level of competence attained in the major study area should be such that the graduate can teach upper-level seminars and conduct research in that area. If a second area of concentration is chosen, it is often complementary to the first. Here the graduate is expected to have knowledge sufficient to teach undergraduate courses at the introductory and intermediate levels, even if teaching is not the ultimate career objective.

In addition to the area(s) of specialization, the candidate is expected to have a broad background in general geography as well as knowledge of those research skills most appropriate to the areas of specialization. This background is primarily gained through coursework requirements in the bachelor's and master's degree programs, which are prerequisites for Ph.D. work.

FLORS Requirement. Foreign language or research skills (FLORS) are important elements of any graduate program. Coursework necessary to meet this requirement should commence early in the program. Selection of a particular FLORS option must be approved by the student's advisor.

Possible options include the following:

1. Demonstrate a reading knowledge of two foreign languages relevant to the student's research interest. Usually this is accomplished by passing an examination with an appropriate member of the geography faculty (or with a member of a language department faculty if expertise is not available within the department) or by completing French 100, German 101, Italian 100, Dutch 101, Danish 101, Russian 101, and/or Spanish 100. See the Graduate Catalog for details.
2. For a single foreign language, demonstrate a reading, writing, and speaking capability sufficient to enable the student to do field work without an interpreter. An examination for competence, including written and oral portions, will be conducted by a member of

the geography faculty having expertise in that language or an examiner from the appropriate language department.

3. Demonstrate a satisfactory capability in two research skills from the list below. The actual courses must be approved by the student's advisor with the agreement of the GSC.
 - a. Computer Science--complete a computer-programming course in the Department of Electrical Engineering and Computer Science (e.g., C + +, Fortran, or Visual Basic) and create a substantial computer program that illustrates a geographic application of that language. Both the course and computer program must be approved by the Computer Programming Committee of the Department of Geography.
 - b. Mathematics--pass nine hours of courses at the 500 level or above.
 - c. Statistics--pass nine hours of courses outside the Geography Department at the 500 level or above.
 - d. An outside discipline relevant to the student's field(s) of specialization within geography, e.g. anthropology, biology, economics, geology, history, psychology--pass nine hours of courses at the 500 level or above, normally at KU, including at least one research seminar. (Atmospheric science courses may be used for this option, but not courses listed or cross-listed as geography).
4. Demonstrate a reading knowledge in one foreign language and a satisfactory capability in one of the research skills listed above.

Students whose native language is not English may, in some cases, use their native language to fulfill part of the reading-knowledge aspect of FLORS. The Graduate School has ruled that the student must, however, combine this native-language option with either reading knowledge of another non-English language (i.e. option 1 above) or one of the research skills mentioned in option 3. Using a native language to fulfill part of the FLORS requirement must have advisor and GSC approval.

Residency Requirement. In order to fulfill the university's residency requirement, a student must be involved full-time in academics for two semesters. One of these semesters can be a summer session. Full-time is defined as any of the following combinations:

- 1) 9 credit hours per semester; or 6 credit hours per summer session;
- 2) 8 credit hours per semester with a 30% TA or RA;
- 3) 7 credit hours per semester with a 40% TA or RA;
- 4) 6 credit hours per semester with a 50% TA or RA;
- 5) 5 credit hours per summer session with a 25% TA or RA;
- 6) 3 credit hours per summer session with a 50% TA or RA.

SOURCES OF FINANCIAL AID

Graduate Assistantships. State regulations permit departmental aid in the form of teaching assistantships to be offered only one year at a time. Assuming good performance by an incoming T.A. in his or her coursework and teaching duties, however, the department is committed to continuing these awards through a second year for an M.A. student and through a second and third year for a Ph.D. student.

Research assistantships are awarded by invitation through the professor holding the grant or other source of funding. Normally, a student is selected because of special research skills that integrate well with the research project.

Stipends for half-time teaching appointments currently are \$16,482 for nine months. All teaching and research appointments made at 40% of full time or more carry eligibility for tuition at the reduced staff rate. This rate is set on a per-credit-hour basis, and at present is the same as the Kansas resident tuition. Teaching assistants also receive a tuition waiver based on the percentage of time they are appointed. For example, a half-time appointment currently receives 100% waiver of tuition. In addition, three hours of required campus fees are paid. The remaining campus fees must be paid by the student, however. Nonresident students appointed for less than 40% of full time pay the nonresident tuition. Teaching and research assistantships are normally available only to full-time, degree-seeking students. Graduate students in geography are eligible to apply for teaching assistantships in several other department and programs at KU. Please refer to our website www2.ku.edu/~geography.

Madison A. and Lila Self Graduate Fellowships. These competitive, four-year fellowships are offered by the university to superior students seeking the Ph.D. The current stipend is \$28,500 each year for four years plus tuition and fees. The Self program is restricted to science students, which includes physical geography and geographic information science areas of concentration.

Graduate Initiative for Diversity

Graduate Fellowship for Diversity/Eunice H. Melik Diversity Fellowship

The Graduate Initiative for Diversity is intended to increase the participation in graduate study at KU by students who are from groups underrepresented in their field of study. A limited number of one-year fellowships are available to students who have been admitted to a graduate program. Nominees are expected to possess an outstanding academic record. The fellowships provide a one-year stipend of \$18,000 plus payment of up to 9 graduate credit hours of tuition and fees for the first year of study. Teaching and research assistantships provide compensation at the normal rate for such appointments. Teaching and research assistants will receive a tuition waiver or in-state fee status in accordance with his/her research or teaching appointment. Awards to students will be during their first year of study. Departments are expected to offer a half-time teaching or research assistantship for the remaining years of study, provided the student maintains good academic standing and satisfactory employment performance.

The following must be submitted electronically with the nomination: completed nomination coversheet; nomination statement by department, including a statement that the student is from a group underrepresented in their field of study; student's personal essay; student's

curriculum vitae/resume; transcripts of all college or university work; copy of GRE scores or other method of testing and/or evaluating quality; three letters of reference, and signed access waiver form indicating student's access to files or recommendations.

Other Employment Opportunities. Beyond the above sources of income, the department has numerous connections with other units on campus that employ graduate students. Several research assistantships are normally offered through the Kansas Geological Survey, the Kansas Applied Remote Sensing Program, KU Cartographic Services, and other units. In addition, student hourly and work-study employment is advertised through the University Career Center.

GEOGRAPHY CURRICULUM

The Department of Geography offers a broad undergraduate curriculum as well as intensive graduate training. Students can obtain instruction in the areas of regional, physical, and cultural geography. Emphasis is also placed on geographic information science and methodology, including the areas of cartography, GIS, remote sensing, and quantitative methods. Inter-disciplinary research is encouraged.

The department offers a full graduate program leading to both the M.A. and the Ph.D. Degree. Since many students applying for graduate work in geography do not have undergraduate degrees in the discipline, undergraduate course offerings are listed below. Students having undergraduate deficiencies may be required to take one or more of these courses in addition to their M.A. or Ph.D. work.

A. Undergraduate 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 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 or GEOL 101, or consent of instructor.

GEOG 335 Introduction to Soil Geography. (4)

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.

Prerequisite: GEOG 104 or GEOL 101 or consent of instructor; BIOL 104 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)

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.

B. Undergraduate and Graduate Courses

GEOG 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.

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 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.

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. 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 116 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 formational 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)

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 536 Landscape Ecology. (3)

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 consent of instructor.

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)

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 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.

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 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.

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 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.

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 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.

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.

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. The 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 GSC.

One alternative to 714 is to take a similar course at another college of university. Any questions about the Field Experience class should be directed to the department's director of graduate studies.

GEOG 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.

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 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.

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 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.

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 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.

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 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.

GEOG 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.

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.

C. Graduate Only Courses

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 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.

GEOG 805 Introduction to Graduate Study. (3)

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.

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 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: EOG 535 or equivalent, or 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 937 Seminar in Vegetation Geography. (1-3)

Same as BIOL 968.

GEOG 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.

GEOG 957 Seminar in Urban and Economic Geography. (2-3)

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 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.

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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