POLICIES FOR GRADUATE STUDY IN GEOGRAPHY

This publication is for informational purposes and does not constitute a contract.

2012
INTRODUCTION

Policies for Graduate Study in Geography (the Geography “Red Book”) focuses on graduate guidelines specific to the Department of Geography and is not intended to summarize or cover all policies for graduate study at the University of Kansas. For guidelines published by the University and the College Office of Graduate Affairs (COGA), see the following links:

Online Graduate Catalog:  http://www2.ku.edu/~distinction/cgi-bin/overview302

COGA Graduate Policies:  http://www.clas.ku.edu/coga/department/policies

University Policy Library:  http://www.policy.ku.edu/office.shtml

Graduate policies are continually being reviewed, updated, and published. As a general principle, specific graduate policies apply to those students who enter the program after the effective date of the policy. Students who entered the program prior to the effective date of a policy generally have the option of following either the policy in force when they entered the program (sometimes referred to as “grandfathering”) or the new policy. Decisions about which policy to follow should be made in conjunction with the advisor and any questions should be directed to the Chair of the Graduate Studies Committee.

Every effort is made to ensure that the policies spelled out in Policies for Graduate Study in Geography are free of error and conform to policies published by the University and the College Office of Graduate Affairs (COGA). In any case of disagreement between policies in this book and University or COGA policies, the University or COGA policies take precedence.

GENERAL PROCEDURES

Annual Progress Reports. All graduate students will be evaluated on an annual basis to achieve the following goals:

1) To fairly and transparently allocate funding beyond our normal 3 years for Ph.D. and 2 years for MA/MS students based on student progress and achievements.
2) To identify students who are under performing and in need of assistance.
3) To keep track of graduate student performance and achievements.

The evaluation procedure consists of the student filling out a form and sending it to their advisor for additional (optional) comments.

Annual Meeting with Thesis or Dissertation Committee. Once an MA thesis or Ph.D. committee has been established for a student (normally by the end of the first year of academic residence), the student will be required to meet with committee members on a yearly basis (before April 1 of the spring semester) to review the student’s program in all of its facets.
**GTA Evaluations.** The department is required to evaluate all Graduate Teaching Assistants at least once every academic year during the GTA’s appointment. The performance evaluations must include classroom observations documented in writing and a written performance evaluation from the evaluator. Faculty evaluators are assigned each year. Evaluations must be completed by May 31 of each year. Beyond the obvious advantage of improving teaching, this process will enable faculty members to comment directly on teaching skills when writing letters of recommendation for on-campus awards or postgraduate positions.

**Directed Readings and Independent Research Hours.** Although the Graduate School sets minimal hours requirements for the M.A., M.S., and Ph.D. degrees, most students take coursework beyond this basic core. Formal classes and seminars constitute the heart of degree programs, but independent study through readings-research-problem courses is often a useful adjunct. M.A. or M.S. students wanting to take more than 6 hours of independent study courses and Ph.D. students wanting to take more than 12 hours of independent study, however, must first obtain permission from the Graduate Studies Committee (GSC). In addition, a one-page statement of the nature of each independent study course shall be prepared by the student, signed by the professor involved, and placed in the student’s file. If these statements are not so filed, the student will not be permitted to take the M.A. or M.S. proposal defense or Ph.D. comprehensive exam.

**Incompletes.** Students are strongly discouraged from requesting "incompletes" in lieu of regular letter grades. Students with six or more hours of "incomplete" grades will be denied permission to enroll until these hours are reduced to the allowable limit (i.e., five hours). "Incomplete" grades automatically revert to an “F” after one year.

**Colloquium Attendance.** All graduate students are strongly encouraged to attend the various departmental colloquia offered throughout the year. Enrollment in Geography 980 (Seminar in Geography: Colloquium) for 1 credit hour is required during each of the first two semesters of residence at KU.

**THESES AND DISSERTATIONS**

**Philosophy.** The department envisions master's theses to be demonstrations of a student's ability to formulate a geographic research problem, collect and analyze relevant data or appropriate literature, arrive at logical conclusions, and present the entire exercise in an acceptably professional form. Theses are more often learning experiences than substantive contributions to the field. The Ph.D. dissertation, on the other hand, is a major research effort designed to contribute significant new knowledge to geography.

**Guidelines for Proposals.** Although a dissertation proposal is necessarily more elaborate than that for a M.A. or M.S. thesis, all proposals are expected to contain four basic elements:
1. Problem statement—the research problem and/or questions presented in concise terms.

2. Relevant literature—a demonstration of how the proposed research relates to existing knowledge.

3. Outline of methodology—an outline of the general methodology if not specific techniques to be utilized in solving the research problem or answering the basic research questions.

4. A projected timeline for completion.

While these are the minimum content requirements for all proposals, students should consult with their advisor early in the proposal writing process with regard to specific format, length, or content requirements. It is expected that the student will consult closely with the advisor during the development and drafting of the proposal and that the student will receive the advisor's approval of the proposal before submitting it to committee members and scheduling the M.A. or M.S. thesis proposal defense or the Ph.D. oral exam.

**Thesis and Dissertation Format.** Because of the diversity of Geography as a discipline, the Department does not specify a required format for theses and dissertations. The preferred format varies from subfield to subfield and from advisor to advisor; therefore, you should consult with your advisor early in your graduate studies with regard to your advisor's required format. In all cases, of course, the thesis or dissertation must meet University guidelines.

**Submission of Thesis/Dissertation for Committee Examination.** Students should submit theses and dissertations directly to their advisors, and this advisor's approval must be received before a "clean and complete" version of this document is passed on to other committee members and the final oral defense is scheduled. A "clean" manuscript is typed in legible fashion with a minimum of handwritten corrections and is "complete" in the sense that the entire text is provided, together with table of contents, notes, bibliography, appendices, and supporting materials such as tables, graphs, maps, and illustrations. Graphics and maps should be carefully laid out with complete information in a format (size and shape) that is appropriate for inclusion in the final document. The thesis/dissertation need not, and in fact should not, be in final form for submission. The presumption is that some changes will be necessary and these are easier to recommend and implement if the copy is "clean and complete" but not "final." Five weeks before the intended date of a student's final oral examination, the student (with approval of the committee chair) will submit a complete draft of the thesis or dissertation to all committee members. The advisor and committee members have a responsibility to provide timely evaluations. Within two weeks of this submission, committee members must indicate whether or not the thesis or dissertation is defensible by signing a "Permission to Schedule Defense" form.

**Public Presentation.** All M.A., M.S., and Ph.D. defenses must have a public component, which typically will involve an oral presentation by the student. These defenses must be announced via departmental email, the departmental Web page, and flyers posted in Lindley Hall. Once the presentation has been given and the public has been given a chance to ask questions, the public
will be required to leave, and committee members will be able to ask questions in a private session.

Publication of Thesis and Dissertation Research. It is an expectation of the Department of Geography that all thesis and dissertation research be of publishable quality. All graduate students, under the guidance of their advisors and graduate committees, are strongly encouraged to develop a plan to publish their research in peer-reviewed journals, edited books, or other appropriate venues. Elements of that plan may include publishing abstracts and making presentations at scholarly conferences, submitting conference proceedings papers, and structuring the thesis or dissertation so as to facilitate publications.

M.A. or M.S. Program and Coursework. The program at the M.A. or M.S. 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. Upon a student’s admission to the department, the Graduate Studies Committee will appoint an advisor. Early in the first semester (preferably in the first week of classes), the student should meet with this advisor to outline a tentative program of coursework for the degree. Such programs should be solidified by the time of enrollment for the second semester and submitted to the GSC for approval. The student and advisor then continue to discuss and update programs each semester, bearing in mind that any substantive changes must be approved by the GSC. Program sheets are available in the department office and must be filed before the proposal defense can be scheduled. All candidates must pass a proposal defense (after a substantial portion of the coursework is complete) and then submit and successfully defend a thesis in a final oral defense. The course requirements are as follows:

M.A. Program Requirements

General - One course in each of the following areas of study:
Geographic Information Science
Human/Regional Geography
Physical Geography

Required - GEOG 805 Perspectives in Geography
Two-day (non-credit) orientation before classes begin in the fall semester GEOG 980 (Seminar in Geography: Colloquium) for 1 credit hour during each of the first two semesters of residence at KU.

Recommended - Non-credit 8-hour Responsible Scholarship session held before classes start in the spring semester.

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

**M.S. Program Requirements**

**Required** - GEOG 805 Perspectives in Geography  
GEOG 716 Advanced Geostatistics or an equivalent course in statistics and experimental design  
Two-day (non-credit) field trip before classes begin in the fall semester  
GEOG 980 (Colloquium) for 1 credit hour during each of the first two semesters in residence at KU

**Recommended** - Non-credit 8-hour Responsible Scholarship session held before classes start in the spring semester.

**Electives** - One course (500-level or above) in each of the three areas in geography (GIScience, Physical Geography / Atmospheric Sciences, and Regional / Human Geography).

At least three courses (500-level or above) in an approved area of concentration (GIScience or Physical Geography). GIScience or Physical Geography courses taken to meet the one course in each of the three areas in geography electives cannot be double counted here.

For the GIScience concentration, a graduate level (500-level or above) computer programming course must be one of the three electives.

**Thesis** - 1-6 hours

Total credit hours: a minimum of thirty

**The M.A. or M.S. Committee.** Ideally, work on the M.A. or M.S. thesis should begin during the second full-time semester so that field, laboratory, or library work can be done the following summer. During the second semester of the M.A. or M.S. program, the student should decide on the general area of thesis research and select a member of the Geography faculty who is competent in that area and is willing to supervise the thesis and serve as the student’s general advisor. The student’s advisor must have at least a partial FTE appointment (i.e., tenured or tenure-track) within the Department of Geography. Should the student desire an advisor outside of the department, a departmental co-advisor is required. In consultation with the faculty advisor, the student should invite two additional members of the graduate faculty to serve on the M.A. or M.S. Committee. At least one of the additional committee members must be a member of the Geography faculty – all committee members must be approved by the GSC. Additional
committee members beyond the minimum of three may be appointed to the M.A. or M.S. Committee if desired and if approved by the GSC. Members of the M.A. or M.S. Committee conduct the proposal defense, read the thesis, and conduct the final thesis defense.

**Proposal Defense.** Each M.A. or M.S. student will undergo a proposal defense with members of his or her M.A. or M.S. committee to demonstrate that he or she is prepared to conduct research that will result in a satisfactory thesis. This examination should take place after a substantial portion of the coursework is complete and after at least one full draft of the proposal has been submitted to the advisor for review. The proposal defense may address all components of the proposal, including the problem statement, the literature review, and, particularly, the methods of research and analysis to be applied.

At the conclusion of the proposal defense, the committee awards an evaluation of either Satisfactory or Needs Revision. In cases where the committee determines that the proposal needs to be revised, the student is provided specific criticisms that need to be addressed. Once the criticisms have been addressed, the proposal is circulated to the advisor and then to the committee members. There is no need for the committee to formally meet again unless the advisor deems it necessary. Once the proposal is determined to be satisfactory by all committee members, the advisor forwards the decision to the Graduate Studies Committee.

**M.A. or M.S. Final Examination.** A final general examination in geography is required of all M.A. or M.S. students. This examination, a defense of the thesis, is normally held during the semester of the student's final enrollment in coursework but cannot occur until the entire thesis has been completed and has received approval from the advisor. The examination should be scheduled for a two-hour time slot, and in no case is it to extend beyond three hours. This final examination is separate from, and should not be confused with, the proposal defense, which is held earlier in the program when the proposal is complete and the student is ready to begin research.

**Other M.A. or M.S. Procedures.**

**Continuous Enrollment.** All master's students who have completed required coursework for their degrees are required to be continuously enrolled until all requirements for the degree are completed. No enrollment is necessary for the summer term unless the degree will be completed at that time. The Graduate School has established a maximum time limit of seven years between initial graduate enrollment and completion of all degree requirements.

**Submission of Thesis.** When the thesis has been completed, a thesis defense is scheduled. The student must submit a list of committee members, the proposed date and time, and the thesis title three weeks prior to the scheduled defense. After a successful defense, both electronic and hardbound copies need to be prepared. Both should include an abstract of no more than 150 words. A hardbound copy (8 1/2" x 11") is required for the department. The KU Libraries recommend the following binders that can bind paper copies of your thesis and additionally offer
print-from-electronic file services: 1) Heckman Bindery (http://www.thesisondemand.com/) or 2) Acme Bookbinding (http://www.acmebook.com/bindery/thesis). Bound copies can also be obtained through UMI Dissertation Publishing. The student must turn in a receipt showing that arrangements have been made for such work prior to the deadline for graduation set by the Graduate School. It is also customary for the student to provide a bound copy for the advisor.

The thesis must be submitted to the Graduate School and UMI Dissertation Publishing electronically using Portable Document Format (PDF). Instructions for this process are available at the KU graduate school website. See also UMI's website at http://dissertations.umi.com/ku/. In addition to this electronic submittal, a student must submit a paper copy of the title page and an "acceptance page" with original signatures to the College Graduate Studies Office in 102 Strong Hall. Formats for both of these are at the graduate school website. A copy of the title page should also be turned in to the Geography office.

KU M.A. or M.S. Students Continuing for the Ph.D. Departmental M.A. or M.S. students desiring to continue at KU for their Ph.D. studies must apply to the Graduate Studies Committee. The application consists of a letter requesting admission accompanied by letters of evaluation from at least two KU faculty members in a position to judge the student's performance at the graduate level; one of these letters must be from the chair of the student's M.A. or M.S. committee. A student is eligible to apply any time after successfully passing his or her M.A. or M.S. examination. No more than nine hours of coursework completed within the M.A. or M.S. program and in excess of the thirty-hour minimal requirement therein will be allowed to count toward Ph.D. requirements.

JOINT MASTER'S PROGRAM IN GEOGRAPHY AND URBAN PLANNING

This interdisciplinary program combines in three years the degrees of M.A. 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

Programs and Coursework. The doctoral program generally includes sixty hours of work beyond the M.A. or M.S. 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. Program sheets are available in the department office and must be filed before the comprehensive examination can be scheduled.

**Required Courses.** GEOG 805 Perspectives in Geography.
Two-day (non-credit) orientation before classes begin in the fall semester.
GEOG 980 (Seminar in Geography: Colloquium) for 1 credit hour during each of the first two semesters of residence at KU.
Non-credit 8-hour Responsible Scholarship session held just before classes start in the spring semester.

**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
- Geographic Information Systems
- Remote Sensing

Egbert, Li, Lei
Braaten, Brunsell, Egbert

II. **Physical Geography**

- Biogeography
- Climatology
- Geomorphology
- Pedology

Brown, W. Johnson
Braaten, Brunsell, Mechem, Tucker, van der Veen, Rahn
W. Johnson, Hirmas
Hirmas

III. **Human Geography**
Cultural Cheong, Herlihy, J. Johnson, O’Lear, Shortridge, Diener, Chikanda
Historical Herlihy, Shortridge
Political O’Lear, Warf, Diener
Regional Development Brown, Cheong, Warf
Urban Warf

IV. Regional Geography

Africa Chikanda
East Asia Cheong
Latin America Brown, Herlihy
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.

Research Skills Requirement. Research skills are important elements of any graduate program and should complement the student’s research topic. Coursework necessary to meet this requirement should commence early in the program. Selection of a particular Research Skills option must be approved by the student’s advisor and student’s committee members. A student’s Research Skills requirement may be met by one of the following:

1. Demonstrate a reading, writing, and speaking capability in a single foreign language 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 the appropriate language department having expertise in that language.

2. Demonstrate a satisfactory capability in one research skill from the list below. The actual courses must be approved by the student’s advisor and committee members.

   a. Computer Science--complete a computer-programming course in the Department of Electrical Engineering and Computer Science (e.g., C++, Fortran, or Visual Basic) with a grade of B or higher 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--complete nine hours of courses at the 500 level or above with a grade of B or better.

c. Statistics--complete nine hours of courses outside the Geography Department at the 500 level or above with a grade of B or higher.

d. An outside discipline relevant to the student's field(s) of specialization within geography, e.g. anthropology, biology, economics, geology, history, psychology--complete nine hours of courses at the 500 level or above with a grade of B or higher. (Atmospheric science courses may be used for this option, but not courses listed or cross-listed as geography.) Students may petition the Graduate Studies Committee to have nine hours of courses at the 500-level or above in multiple departments fulfill this requirement.

Students whose native language is not English may, in some cases, use their native language to fulfill the Research Skills requirement but only if the language is considered an adequate research tool for their program and is justified by the student's advisor and committee members. Using a native language to fulfill part of the Research Skills requirement must GSC approval.

**Responsible Scholarship Requirement:** As part of the University requirement that all Ph.D. students receive "training in responsible scholarship relative to the field of study," the Department of Geography will conduct a non-credit training seminar in responsible scholarship to be held at the beginning of spring semester each year. This requirement must be completed prior to taking the comprehensive exam. The seminar consists of eight (8) contact hours between seminar leaders and Ph.D. students. Seminar leaders will include faculty members in the Geography Department who represent the broad range of research fields in Geography and who have expertise and experience in the topic(s) they cover. Topics to be addressed will include (but are not limited to): human subjects, data management, conflicts of interest, appropriate research conduct, collaborative research, authorship of research articles and grant applications, citation ethics, plagiarism, copyright, peer review, confidentiality and non-disclosure agreements, mentor/student responsibilities, classroom behavior and ethics, and professional liability. The format will consist of readings, policy reviews and resources, short presentations, case studies, and discussion.

**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.

**Comprehensive Examination.** The comprehensive examination is scheduled when the student and the advisor believe that competence in the specialty or specialties has been achieved. Normally the process occurs after the student has completed nearly all of his/her coursework, although Graduate School regulations stipulate that the testing can take place as soon as five months after enrollment in the Ph.D. program. Admittance to the examination is by approval of the GSC. In petitioning for admittance, the student must submit the following materials at least three weeks prior to the scheduled examination (forms are available for 1 and 2 in the departmental office).

1. a program sheet listing courses taken, grades received, etc.

2. demonstration that the Research Skills and Responsible Scholarship requirements have been satisfied (see description above).

3. demonstration that the Residency Requirement has been satisfied (see description above).

4. a written dissertation proposal approved by the advisor (see guidelines on previous pages of this document).

5. a list of examination committee members. The Graduate School requires that the committee consist of at least five members of the graduate faculty. This consists of the student’s advisor and four additional members. The student’s advisor must have at least a partial FTE appointment (i.e., tenured or tenure-track) within the Department of Geography. Should the student desire an advisor outside of the department, a departmental co-advisor is required. At least one member must be from a KU department outside of geography and at least three members must represent the department. Members are chosen by the student in consultation with the advisor on the basis of expertise in the areas of specialization. They must also be approved by the GSC and recommended by the department to the Graduate School.

6. The date and time proposed for the oral portion of the examination.

The comprehensive examination normally focuses on the student's areas of specialization, including proposed dissertation research. It consists of two parts: written questions submitted by the committee members and then an oral examination. At least four members of the committee must submit written questions. The procedure is for each examiner to give his/her questions to the chair of the student's committee at least one week before the written examinations begin. The committee chair has the responsibility of screening these questions for overlap and clarity, and then administering them, one set per day. The questions may be open-book or closed at the discretion of the individual submitting the questions, and the student normally will have up to eight hours to complete each set of questions. At the conclusion of the written portion of the
examination, the committee chair will poll the committee. A majority of the members must approve their individual written portions of the examination in order for the second (oral) portion to take place. In the oral section, students often are asked to elaborate and comment on their written answers. The focus is on the proposal, however, with probes into its scope, justification, and methodology being common. Significant revisions to the research subject and approach sometimes emerge from this process. Three grades are possible for the overall examination: "honors," "satisfactory," and "unsatisfactory." In the unsatisfactory case, the student may be allowed to repeat the process upon recommendation of the committee. Such repetition can be undertaken no sooner than ninety days after the last testing. The comprehensive examination may be taken no more than three times. Approval of the Graduate School must be secured for the scheduling of this procedure and the request must be submitted three weeks prior to the proposed date for the examination.

**Ph.D. Comprehensive Exam Procedures.** In order to give committee members sufficient time to read and discuss responses to the written comprehensive examination questions, at least seven (7) calendar days must elapse between the date of the last written exam question and the meeting for the oral examination. The gap between the last written exam question and the oral exam may be up to 30 calendar days. Any exceptions to these policies must be unanimously agreed upon by all examination committee members and the chair of the Graduate Studies Committee.

**The Doctoral Dissertation.** Serious work on the dissertation should begin no later than the third full-time semester of study for the Ph.D. and well before the scheduling of the comprehensive examination. When selecting a topic, the student first should make sure that an advisor exists who is able and willing to supervise on that subject. Then, usually in close consultation with this advisor, a proposal is developed to articulate the research idea for the rest of the examination committee. The advisor also serves as chair of this committee.

The dissertation committee, consisting of the advisor and at least four others, is designated immediately following the passing of the comprehensive examination and is usually comprised of members of the examination committee. This committee must include at least one member from a KU department outside of geography and must have at least two members from Geography. Committee members must be approved by the GSC and recommended to the Graduate School.

After successful completion of the comprehensive examination, the student is officially admitted to candidacy for the Ph.D. degree (prior to this stage, the student is a Ph.D. aspirant). By passing to the candidacy stage, the examination committee records its view that this person has a satisfactory dissertation proposal as well as the capability to complete the proposed task of research and writing. Although formal coursework is finished at this point, continued scholarly and professional development obligates the candidate to continue attendance at special-interest seminars and colloquia while still in residence.

After passing the comprehensive oral examination, every student must be continuously enrolled, including summer sessions, from the time of candidacy until the dissertation is deposited at the
Graduate School office. The Graduate School further stipulates that a minimum enrollment of six hours is required each semester (plus three in summer) until a total of eighteen is achieved. Thereafter the enrollment may be dropped to one hour per semester, assuming that the dissertation is deposited in the Graduate School office within six months after the defense. Students who exceed this six-month limit must enroll in three hours per semester until the dissertation is so deposited.

When the dissertation committee has tentatively approved the dissertation, approval is sought from the Graduate Studies Committee to schedule the final oral defense. At least five months must elapse between the successful completion of the comprehensive examination and the date of this oral defense. The final oral defense committee has the same composition requirements as does the dissertation committee. Approval of the Graduate School must be secured for the scheduling of this exam and the request must be submitted to the GSC three weeks prior to the proposed date for the examination. Submission procedures for the dissertation are described elsewhere in this booklet.

When the final oral defense has been passed and the dissertation completed, both electronic and hardbound copies need to be prepared. Both should include an abstract of no more than 150 words. A hardbound copy (8 1/2” x 11”) is required for the department. The KU Libraries recommend the following binders that can bind paper copies of your thesis and additionally offer print-from-electronic file services: 1) Heckman Bindery (http://www.thesisondemand.com/) or 2) Acme Bookbinding (http://www.acmebook.com/bindery/thesis). Bound copies can also be obtained through UMI Dissertation Publishing. The student must turn in a receipt showing that arrangements have been made for such work prior to the deadline for graduation set by the Graduate School. It is also customary for the student to provide a bound copy for the advisor.

The dissertation must be submitted to the Graduate School and UMI Dissertation Publishing electronically using Portable Document Format (PDF). Instructions for this process are available at the KU graduate school website. See also UMI’s website at http://dissertations.umi.com/ku/. In addition to this electronic submittal, a student must submit a paper copy of the title page and an “acceptance page” with original signatures to the College Graduate Studies Office in 102 Strong Hall. Formats for both of these are at the graduate school website. A copy of the title page should also be turned in to the Geography office.

The Graduate School has established a maximum time limit of eight years between initial enrollment in the doctoral program and completion of all degree requirements. For people earning both M.A. and Ph.D. degrees from KU, the combined time limit is ten years.

GENERAL INFORMATION

Use of Departmental Resources. Only graduate students who hold teaching assistantships have access to photocopy and secretarial support. All graduate students have access to computers in the various laboratories so long as they follow posted guidelines. The department endeavors to
provide desk space for every graduate student but people holding teaching assistantships and research assistantships have priority. All graduate students are provided with e-mail addresses.

**Departmental Grievance Procedures.** The Geography Department's grievance procedures are on file in the departmental office and are available upon request.

**Student Rights and Responsibilities.**

All graduate students are responsible for informing themselves of requirements of the Graduate School as stated in the most recent issue of the Graduate School Catalog, both the general requirements and those specific to geography. Members of the faculty and the staff of the graduate school are ready to answer questions and offer counsel.

The university’s *Code of Student Rights and Responsibilities* describes protected rights and expectations for conduct. Included are rights to free speech, expression, assembly, pursuit of educational goals, privacy, and due process. It also outlines how student and campus organizations may operate, and describes nonacademic misconduct such as threats and violence against disrupting classes and events. The complete text of the *Code of Student Rights and Responsibilities* is available on-line at [www.vpss.ku.edu/rights.shtml](http://www.vpss.ku.edu/rights.shtml) or at the offices of the Vice Provost for Student Success and the Dean of Students.

July 2015
**Geography Courses**

**GEOG 100 World Regional Geography.** (3)
An introductory survey of the environmental setting, historical formative periods, and present-day issues that distinguish the major culture areas of the world.

**GEOG 101 World Regional Geography, Honors.** (3)
An introductory survey of the environmental setting, historical formative periods, and present-day issues that distinguish the major culture areas of the world. 
*Prerequisite:* Open only to students in the University Honors Program or by consent of instructor.

**GEOG 102 People, Places and Society.** (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 University 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 University Honors Program or by consent of instructor.

**GEOG 110 Geopolitics In the News (3)**
This course examines leading contemporary geopolitical events and processes through the lens of geography. It focuses on major political conflicts and struggles as they play out unevenly over space, contextualizing them within broader themes of neocolonialism, globalization, and the international system of nation-states. Emphasis is put on making issues commonly found in the media understandable to students by providing a relevant historical background and drawing comparisons among events.

**GEOG 111 Mapping our Changing World.** (4)
This course is an introduction to geospatial technologies. It focuses on the conceptual and technical aspects of mapping technologies that transform information about locations, people, objects, environments, events, and phenomena to digital representations of the world and as end-products of geospatial analysis. Topics covered include surveying, aerial photography and photogrammetry, satellite remote sensing, global positioning systems (GPS), geographic information systems (GIS), and thematic mapping. Students will learn how to acquire and develop geospatial data as the sources for mapping, the skills of analyzing and interpreting spatial information, and how geovisualization can be used in addressing real-world problems.

**GEOG 140 Global Environment I: The Discovery of Environmental Change.** (5)
Same as EVRN 140 and HIST 140
This interdisciplinary course and laboratory sections survey the foundations of environmental understanding and the process of scientific discovery from perspectives that combine the principles and methodologies of the humanities, physical, life and social sciences. Key topics will include the history of environmental systems and life on earth, the discovery of biotic evolution, ecological change, and climate change. Laboratory sections apply the principles and methodologies of the humanities, physical, life and social sciences to earth systems and the development of environmental understanding using historical and present-day examples.

**GEOG 142 Global Environment II: The Ecology of Human Civilization.** (5)
Same as EVRN 142 and HIST 142
This interdisciplinary course and its laboratory sections survey the history of humanity's relationship with the natural world over the long term from perspectives that combine the principles and methodologies of the humanities, physical, life and social sciences. Key topics include the evolution of Homo sapiens and cultural systems; the development of hunter, gatherer, fisher, agricultural, and pastoral lifeways; the ecology of colonization and industrial civilization, and the emergence of ideological and ethical perspectives on the relationship between nature and culture. Laboratory sections apply the principles and methodologies of the humanities, physical, life and social sciences to human engagement with the global environment using historical and present-day examples.

**GEOG 144 Global Environment I: The Discovery of Environmental Change, Honors.** (5)
Same as EVRN 144 and HIST 144
This interdisciplinary course and laboratory sections survey the foundations of environmental understanding and the process of scientific discovery from perspectives that combine the principles and methodologies of the humanities, physical, life and social sciences. Key topics will include the history of environmental systems and life on earth, the discovery of biotic evolution, ecological change, and climate change. Laboratory sections apply the principles and methodologies of the humanities, physical, life and social sciences to earth systems and the development of environmental understanding using historical and present-day examples. Open only to students admitted to the University Honors Program or by permission of instructor.

**GEOG 145 Global Environment II: The Ecology of Human Civilization, Honors (5)**
Same as EVRN 145 and HIST 145
This interdisciplinary course and its laboratory sections survey the history of humanity's relationship with the natural world over the long term from perspectives that combine the principles and methodologies of the humanities, physical, life and social sciences. Key topics include the evolution of Homo sapiens and cultural systems; the development of hunter, gatherer, fisher, agricultural, and pastoral lifeways; the ecology of colonization and industrial civilization, and the emergence of ideological and ethical perspectives on the relationship between nature and culture. Laboratory sections apply the principles and methodologies of the humanities, physical, life and social sciences to humanity's engagement with the global environment using historical and present-day examples. Open only to students admitted to the University Honors Program or by permission of instructor.
GEOG 148 Scientific Principles of Environmental Studies. (3)
Same as EVRN 148
This course presents an overview of our understanding of environmental processes and issues. Topics include scientific principles, resource issues, pollution and global change, among others. 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 issues. Topics include scientific principles, resource issues, pollution and global change, among others. 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 University 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 177 First Year Seminar: (3)
A limited-enrollment, seminar course for first-time freshmen, addressing current issues in Geography. Course is designed to meet the critical thinking learning outcome of the First-Year Seminar topics are coordinated and approved by the Office of First-Year Experience.

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, hydroospheric, 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 are seen as examples.

GEOG 311 Introductory Cartography and Geovisualization. (4)
This course is an introduction to cartography and focuses on computer-based map making skills. It begins with the history of cartography, cognitive maps, and the use of maps in the past and modern times. Topics covered in the course emphasize spatial data handling, principles of cartography and symbolization, map elements and design, and mapping techniques such as choropleth, proportional symbol and dot maps. Students will learn to adopt appropriate spatial data and mapping techniques to create accurate and creative digital maps reflecting given phenomena.

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 introduces 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 also evaluates the impact of climate on living organisms and the human environment. Finally, past climates are 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 processes and forces 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 geographic resources, satellite imagery, and internet sources or 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)
Same as EVRN 335
This course focuses on the properties and processes of soils as they occur in their environment. The student is introduced to the nature of soil as it functions as a body; genesis of soils; properties of soil solids especially colloids; soil chemical composition, properties, and reactions; interaction between solid, liquid, and gaseous components in soils; plant-soil-water relationships; biological interactions with soil; classification of soils; and the distribution of soils on the landscape. Laboratory section is required. Not open to students who have taken GEOG 535/EVRN 535.
Prerequisite: GEOG 104 or GEOL 101 or consent of instructor; BIOL 100 and CHEM 130 or CHEM 190 recommended.

GEOG 336 Introduction to Environmental Hydrology and Water Resources. (3)
Same as EVRN 363
Water is vital to life on earth. In this course we will cover components of the water of "hydrologic" cycle, how management has altered them, and how they are predicted to change with the changing climate. We will discuss the evolution of water policy, its implications for management and the economic impact of human perturbation on water. We will study the physical processes that govern the water cycle, learn how they are
measured, and estimate hydrologic fluxes.  
Prerequisite: GEGO 1014 or GELT 101/102.

GEGO 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: GEGO 104.

GEGO 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.

GEGO 350 Physical Geography of Africa.  (3)  
Same as AAAS 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 five 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.

GEGO 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, rural development, urbanization, gender issues, and political geography. Case studies from Eastern and Southern Africa will be used to illustrate major themes.

GEGO 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.

GEGO 354 Globalization.  (3)  
Same as GIST 354  
This course is designed to provide a broad overview of some major facets of the historical, economic, political, cultural and geographical dimensions of contemporary globalization, the process by which individual regions and nations have become progressively linked, and structured by, the world-system of states and markets, and the cultural contradictions associated with this process.

GEGO 357 History and Philosophy of Geographic Information Science.  (3)  
An examination of the development of geographic information science (GISc) 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.

GEGO 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.

GEGO 360 Computer Programming for Mapping and Spatial Analysis.  (3)  
This course teaches basic computer programming concepts and skills for mapping and spatial analysis using various scripting languages. The goal is to enable students to write computer programs, develop mapping applications, and perform spatial data analysis. This course will lay the foundation for computerized problem solving skills that can be applied in later courses. This course assumes no previous programming experience.

GEGO 370 Introduction to Cultural Geography.  (3)  
Charts some of the major lines of research in cultural geography, including critical theory, political economy, post-structuralist 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: GEGO 100, 101, 102 or 103; or consent of instructor.

GEGO 371 Environmental Geopolitics.  (3)  
Same as EVRN 371/GIS 371  
This course examines how human relationships with the biophysical world are politicized. Examines key contributions to debates surrounding environmental security, resource conflicts, and related issues, as well as geopolitical assumptions on which these debates build.

GEGO 372 Environmental Policy.  (3)  
An historical and analytical study of the formulation, implementation, and consequences of environmental policy in the United States. Attention is directed at relevant interest groups, issues specific to both rural and urban populations, relationships between national policies and international organizations concerned with environmental problems. Prerequisite: GEGO/EVRN 148 and EVRN/HIST 103, EVRN/HIST 347 or GEGO/EVRN 150.

GEGO 373 Political Geography.  (3)  
Political Geography is concerned with spatial dynamics of power. It concerns issues such as territory, boundaries, and identity as well as feminist, post-colonial, geopolitical, and environmental perspectives. This class will consider the development of this subfield, the role it has played in imperial expansion, and ways in which more recent critiques of power have shaped political geography to be a means of understanding different forms of power and its relationship to people and places. Prerequisite: GEGO 100 or GEGO 102 or equivalent or consent of instructor.

GEGO 374 Vulnerability and Adaptation.  (3)  
Same as EVRN 374  
The course objective is to understand and analyze human adaptation to environmental change by focusing on disasters and climate change. Each semester, the course rotates topics ranging from oil spills, hurricanes, sea-level rise to infectious disease. It provides undergraduate students with research experience and service learning, and offers opportunities for certificates through the Center for Undergraduate Research and the Center for Civic and Service Responsibility at KSU. Students learn theories relevant to the case study, work in groups to generate research themes, conduct literature search and review, learn research methods, and write and present their work.

GEGO 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. 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 and consent of the instructor.

GEOG 395 Environmental Issues: _________. (3)
This regional geography course examines contemporary environmental issues of a particular region of the world based on the expertise of the professor. If 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 nongovernmental stakeholders address environmental problems.
Course may be repeated with different professors.

GEOG 396 East Asia. (3)
This course is an introduction to the contemporary politics, economy, and culture of Korea, China, and Japan in the context of globalization. In addition to the discussion of individual countries, the course examines the cross-cutting themes such as international relations, cultural exchange, and economic development in the region of East Asia.

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
Principles of evolution and earth change are used to examine distributions of human populations, economies, wealth, and resources. 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 biophysical attributes of vegetation. During the latter 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 upper level 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 faculty members.

GEOG 500 Senior Capstone in Geography. (3)
The capstone project provides students with a broad-based, interdisciplinary educational experience and allows them to integrate and synthesize the knowledge they have gained in their studies. The major goals of this course are to help students synthesize an integrated view of geography, advance steps toward career preparation, and develop networking and professional skills. The course will provide an overview of geography as a unified, coherent discipline with multiple perspectives, emphasize writing and analytical skills, introduce students to a major research project that integrates elements of physical and human geography, cultivate knowledge for future professional development, and introduce students to professional organizations. Students will gain experience applying and/or interviewing for professional positions and be introduced to multiple professional development and career services on campus. Graduate students may take this course by permission only.
Prerequisite: Nine hours in Geography and status as a senior major in the department, or permission of the instructor.

GEOG 510 Human Factors. (4)
An introduction to the concepts and theories underlying the study of human-technological systems. Human-machine interfaces and system properties, and the environment are considered. Lecture-discussion sessions are supplemented by computer-supported laboratory and research activities.

GEOG 511 Intermediate Cartography: _________. (Selected topic to be specified). (1-6)
An investigation of special topics in cartography. Can be repeated for different topics.
Prerequisite: A course in cartography and consent of the instructor.
GEOG 512 Advanced Cartography and Geovisualization. (4) This is an advanced computer-based scientific cartography course. It covers mapping techniques such as datametric mapping, multivariate mapping, cartogram and flow map, map animation, geovisual analytics, web and interactive mapping, and mapping from remotely sensed imagery. This course focuses on practical and hands-on experience. Students will learn theoretical concepts, principles, and design examples, and produce a cartographic portfolio of well-designed and professional maps. **Prerequisite:** GEOG 311 or equivalent, or consent of 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 transformation. Later projects involve developing more sophisticated software for data presentation, data exploration, and map animation. **Prerequisite:** Some experience with Visual Basic or other programming language.

GEOG 516 Applied multivariate Analysis in Geography. (3) An introduction to the application of multivariate statistical analysis in geography. Techniques covered include univariate and multivariate analysis of variance, multiple regression, logistic regression, principal 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 making maps worldwide from its origins to the present day. Emphasis on maps as historical records of evolving civilizations and cultural landscapes and methods of studying early maps.

GEOG 521 Micrometeorology. (3) Same as ATMO 521. A study of climatic environments near the earth-atmosphere interface. Consideration of rural climates in relation to agriculture and urban climates as influenced by air pollution and other factors. Emphasis is on physical processes in the lower atmosphere, distribution of atmospheric variables, the surface energy budget and water balance. **Prerequisite:** ATMO 105 and Math 125.

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:** MATH 101 or equivalent. GEOG 358 recommended.

GEOG 528 Spatial Databases. (3) This course covers concepts in spatial databases and their relevance in geographic information systems (GIS) and spatial analysis. It introduces the fundamental theories of data management behind Geographic Information Systems and imparts hands-on experience with mainstream spatial database management systems (DBMS), standard query languages and necessary tools to query and transform geospatial data, and perform spatial and network analysis. The course provides more in-depth coverage on database-oriented approaches for GIS geospatial analysis. **Prerequisite:** GEOG 358 or equivalent; may be waived upon instructor's approval.

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, palaeoenvironments, hydrology, etc. May be repeated if topic differs.

GEOG 532 Geoastronomy. (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 geoastronomy (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 ANTH 310.

GEOG 535 Soil Geography. (4) Same as EVRN 535. A broad study of the principles and properties of soils and their distribution on the landscape. Topics covered include: pedology, clay mineralogy, soil physics, soil chemistry, management of soils, soil biology, taxonomy, and soil geomorphology. Laboratory section and a field project are required. Not open to students who have taken GEOG 335/EVRN 335. **Prerequisite:** GEOG 104 or GEOL 101 or consent of the instructor; BIOL 104 and CHEM 130 or 190 recommended.

GEOG 537 Elements of Plant Geography. (3) An introduction to spatial and temporal variation in natural plant populations and communities. Included is an introduction to methods of analysis and an overview of structure and process in the earth's major biomes. **Prerequisite:** GEOG 331, or an introductory biology/botany course and GEOG 104; or consent of instructor.

GEOG 538 Soil Chemistry. (3) Same as EVRN 538. This course examines the chemical properties and processes of soils and methods of evaluation. Topics include solid and solution speciation, mineral solubility, soil colloidal behavior, ion exchange, surface complexation, soil salinity and sodicity, soil acidity, oxidation-reduction reactions, and kinetics of soil chemical processes. **Prerequisites:** GEOG /EVRN 335 or 535, CHEM 135 or 195, MATH 125 or consent of the instructor.

GEOG 540 Ecological Hydrology. (3) Same as EVRN 540. Ecological hydrology is the discipline that answers real world hydrologic and biologic questions through integrating knowledge from hydrology, ecology, atmospheric science and biogeochemistry. We will focus on the key concepts, methodological approaches and analytical techniques utilized in ecological hydrology to understand and quality: plant water use, evolution of hydrologic properties, groundwater/surface water interactions, controls on landscape patterns, spatial and temporal patterns of soil moisture and nutrient.
concentrations, and vegetation competition. Students should leave
the class having developed critical skills in: 1) reviewing scientific
literature, 2) collecting environmental samples, 3) analyzing
eohydrologic data, 4) writing a scientific research paper, 5)
working collaboratively and independently.
Prerequisites: GEOG 104 or GEOL 101/102, GEOG 336 or
permission 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.
Prerequisites: GEOL 101 & GEOL 103, GEOG 104 & GEOG 105,
or GEOL 103 & GEOL 304.

GEOG 550 Environmental Issues in Africa. (3)
Same as AAAS 551
Acquaints students with the complexities of debates on
environmental problems in Sub-Saharan Africa. Topics addressed
may include deforestation, desert expansion, wildlife conservation,
soil erosion, climate change, coral reef destruction, water resources
development, mangrove preservation, and the environmental
effects of war, industrialization, and urbanization. Class
presentations and projects synthesize the perspectives of both
human and physical geography.
Prerequisite: GEOG 104 or permission of the instructor.

GEOG 552 Topics in Urban/Economic Geography: ________
(Selected topic to be specified). (1-3)
An investigation of special topics in urban/economic geography.
May include specific coursework under the headings of energy,
economic development, international trade, environmental
perception, housing, transportation, and migration. May be
repeated if topic differs.

GEOG 553 Geography of African Development. (3)
Same as AAAS 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 555 Seminar in Urban Geography. (3)
Same as GIST 557
This course is a survey of recent literature and conceptual advances
within the broad domain of urban geography. It beings by
examining a few classic works, and then explores several topics
within urban political economy, including the urban division of
labor and restructuring, changing modes of urban governance,
suburbanization, gentrification, global cities, and gender and the
city. It also delves briefly into the issue of urbanization in the
developing world.
Prerequisite: Any upper division course in human geography or
urban planning.

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 are 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 574 Exploring Oceania. (3)
Acquaints students with the culture and history of Oceania
including its settlement and the impacts of European and
American colonialism on Australasia, Melanesia, Micronesia and
Polynesia. Emphasis is placed on applying broad geographical
carrier to this vast Oceanic region through the lenses of
development, media, and migration studies.
Prerequisite: GEOG 102 or 103, or consent of instructor.

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 predominantly 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 577 Human Dimensions of Global Change. (3)
Same as GIST 577
This class introduces concepts such as coupled human and natural
systems, social-ecological resilience, and sustainability science,
examines people's responses to major climate, land, water, and
coastal change, and discusses case studies. One hour of each
seminar will be devoted to individual needs that address topical or
methodological issues. Class requirements include presentations,
iweekly papers, and a term paper.
Prerequisites: One of the following: GEOG 100, GEOG 104,
GEOG 374, or an Environmental Studies introductory course.
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 582 Geopolitics and Genocide. (2-3)
Same as GIST 582
Explores the inherently geographical and geopolitical nature of genocide and related mass violence and introduces an overarching concept, territorial cleansing, that foregrounds the spatial and territorial nature of these events. Detailed studies of cases at a range of scales and locales provide the major context for critical examination and comparison of territorial cleansing concepts. Students enrolling for 3 credits will prepare and present a substantial independent research paper. Prerequisite: GEOG 102 or 103 or ANTH 108 or 109 recommended.

GEOG 590 Understanding Central Asia. (3)
Same as REES 510
An intensive, multidisciplinary survey of Central Asia, focusing on the former Soviet republics-Kazakhstan, Kyrgyzstan, Tajikistan, Turkmenistan, Uzbekistan-with additional coverage of neighboring regions (the Caucasus and the Caspian basin, Afghanistan, and western China). The course addresses the history of the region (from the Silk Road to Soviet rule), geography, religion, and the building of post-Soviet states and societies.

GEOG 591 Geography of Latin America. (3)
A study of the different physical, economic, and cultural settings in Latin America which form the basis for the various forms of livelihood.

GEOG 592 Middle American Geography. (3)
This regional study of the natural environments and cultural-historical backgrounds of Mexico, Central America, and the Caribbean details the physical and historical processes that have shaped the cultural landscape.

GEOG 593 Central American Peoples and Lands. (3)
This is a study of the natural and cultural history of the region's lands and peoples that focuses on the cultural geography of the surviving indigenous populations, including their culture area, culture history, cultural landscape, and cultural ecology.

GEOG 594 Geography of the Former Soviet Union. (3)
An analysis of the spatial organization of the successor states to the USSR. A study of the diverse human and natural resources, demographic, cultural and economic conditions. Prerequisite: An introductory geography course or background in Russian-East European history, social science, or culture or consent of instructor.

GEOG 595 Geography of Eastern Europe. (3)
A study of nations and regions of Eastern Europe, excluding Russia. Prerequisite: An introductory geography course or background in Slavic-East European history, social science, or culture or consent of the instructor.

GEOG 597 Geography of Brazil. (3)
Study of geographic factors, physical and cultural, that are basic to understanding the historical development of Portuguese South America and the contemporary and cultural geography of Brazil. Course also includes a survey of Brazil's South American neighbors.

GEOG 601 Indigenous Peoples of the World. (3)
Same as ISP 601
A survey of the varied responses of global Indigenous peoples as a result of the imposition of external 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 are used.

GEOG 635 Soil Physics. (3)
Same as EVRN 635
Provides theoretical and practical foundations for understanding physical properties and processes of variably-saturated porous media. Focus is on the transport, retention, and transformation of water, heat, gases, and solutes through the soil. We will examine modern vadose zone measurement methods, analytical tools, and numerical models for data collection and interpretation. Prerequisite: GEOG/EVRN 335 or 535, MATH 125, PHSX 114 or consent of instructor.

GEOG 648 Location Modeling. (3)
This course provides an overview of advanced location analysis and modeling in the context of GIS. Introduces students to principles of location analysis, methods for making strategic location decisions as well as existing classic location problems. Demonstrates analytical approaches by which location problems can be solved using mathematical programming, GIS and other optimization software. This course is a specialized course with an emphasis on the spatial analysis function of Geographic Information Systems, which covers many concrete applications of GIS geospatial analysis in urban planning, transportation, and service systems planning, ranging from firefighting stations to forestry management to transportation facilities. Prerequisite: GEOG 358 or equivalent; may be waived upon instructor's approval.

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.

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

GEOG 716 Advanced Geostatistics. (3)
An introduction to the practical application of advanced 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 enhancement 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 GEOG 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.

GEOG 749 Topical 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, palaeocology, 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.

GEOG 752 Topics in Urban/Economic Geography: __________. (Selected topic to be specified). (1-3)
An investigation of special topics in urban/economic geography. May include specific coursework under the headings of energy, economic development, international trade, environmental perception, housing, transportation, and migration. May be repeated if topic differs.

GEOG 758 Geographic Information Science. (4)
This course integrates topics in geographical information science (GISCI) with spatial analytical techniques to solve spatial problems. Focuses on the most current research in GISCI and its relevance to the environmental sciences, natural resource management, and spatial decision-making. Students are expected to apply the concepts and techniques learned in this class to their own research projects.
Prerequisites: GEOG 558 and GEOG 316, or consent of instructor.

GEOG 771 Topics in Cultural Geography: __________. (1-3)
An investigation of special topics in cultural geography. May include specific course methodology, material culture, foodways, religion, and similar topics. May be repeated if topic differs.

GEOG 772 Problems in Political Geography. (3)
Case studies of regional and national power settings with particular emphasis upon the geographical analysis of political developments in unstable areas of the world.
Prerequisites: GEOG 102 or GEOG 375.

GEOG 781 Environmental Geopolitics. (3)
Same as GIST 781
This course examines how human relationships with the biophysical world are politicized. Examines key contributions to debates surrounding environmental security, resource conflicts, and related issues, as well as geopolitical assumptions on which these debates build. This course is a more advanced and rigorous version of the undergraduate version of this course (GEOG 371/EVRM 371). It is not open to students who have taken or are enrolled in GEOG 371/EVRM 371, Environmental Geopolitics.

GEOG 790 North American Regions: __________. (Selected areas to be specified). (3)
A detailed description and analysis of selected regions of North America.
Prerequisite: An introductory geography course or background in United States or Canadian history, social science, or culture or consent of the instructor.

GEOG 791 Latin American Regions: __________. (3)
A description and analysis of the principal sources of geographic information pertaining to portions or all of Latin America.
Prerequisite: GEOG 591, or concurrent auditing of 591, or consent of the instructor.

GEOG 794 Regions of the former USSR. (3)
A description and analysis of geographic data pertaining to the successor states of the USSR.
Prerequisite: Fifteen hours of Geography courses or background in Russian, East European or Middle East studies, or consent of the instructor.

GEOG 795 European Regions: __________. (3)
Prerequisite: Fifteen hours in Geography, background in specified
region, or consent of instructor.

GEOG 796 Asian Regions: _______________. (2-3)  
Prerequisite: Fifteen hours in Geography, background in Asia, or consent of instructor.

GEOG 801 Indigenous Peoples of the World. (3)  
Same as ISP 801. A survey of the varied responses of global Indigenous peoples as a result of the imposition of externally-dominated economic and political systems. An overview of diverse, thematic issues such as land rights, economic development, resources and cultural patrimony, languages, knowledge systems, and women’s rights from the perspectives of Indigenous societies around the world. Detailed studies of Indigenous peoples seeking recognition and protection under international law will be used.

GEOG 805 Perspectives in Geography. (2)  
This course provides background on the discipline of geography and how it is practiced by the faculty in the department. It provides a foundation of knowledge of geography’s role within the human and physical sciences as well as the humanities. Students will gain a critical perspective into the breadth of geography, including the ways in which geographers view the world through the lenses of place, space, and scale and the debates and approaches within the changing landscape of geographic inquiry.

GEOG 806 Basic Seminar. (2)  
The second of two courses required of M.A. students designed to provide experience in the development of research proposals and exposure to methodologies in geography. This course deals with approaches to geographic problems, and involves individual examination of special topics which require preparation, presentation and critical evaluation of research proposals.

GEOG 818 Problems in Production Cartography. (1-3)  
Advanced instruction in the theory and practice of producing maps and other related graphics for classroom instruction and research projects. Emphasis will be on current photomechanical and automated techniques.  
Prerequisite: consent of instructor.

GEOG 858 Environmental Geographic Information Systems. (4)  
An introduction to the use of GIS for environmental inventory, monitoring and modeling. This course integrates the principles of landscape ecology with the analytical tools of GIS, remote sensing and spatial analysis. Students will be taught GIS methodologies used to address real world problems and the use of GIS spatial analysis techniques to characterize landscapes and monitor their change.  
Prerequisite: GEOG 316 and GEOG 558 or equivalents, multivariate analysis recommended.

GEOG 875 Qualitative Research Methods. (3)  
This course provides background on qualitative research methods used in human geography. Students will gain a critical perspective into relevant issues of qualitative methods with specific regard to ethical concerns related to human subjects research within the social sciences and humanities and the debates and approaches within the changing landscapes of qualitative methods. Students will have the opportunity to practice these techniques and strategies in a group research project.  
Prerequisite: GEOG 805 or consent of instructor.

GEOG 890 Geographical Internship. (1-6)  
Supervised professional experience. The student submits to the program committee a proposal describing the internship prior to enrollment. Upon acceptance, regularly scheduled meetings with the advisor provide assistance, guidance and evaluation of progress in the professional experience. A written summary of the experience or outcomes of the research project are prepared independently by the student, a representative of the host agency, and the advisor. Total credit not to exceed six hours. Prerequisite:

12 hours of graduate level geography courses and consent of program committee.

GEOG 898 Readings in Geography. (1-4)

GEOG 899 Master’s Thesis. (1-10)

GEOG 911 Seminar in Cartography: ______________. (Selected topic to be specified). (1-4)  
Study of selected topics in cartography. May be repeated if topic differs.  
Prerequisite: GEOG 513 or consent of instructor.

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

GEOG 926 Seminar in Remote Sensing. (2-4)  
Study of selected topics in remote sensing theory and application. May include independent or group research and/or development work. Topics will be specified in advance.  
Prerequisite: GEOG 726 or consent of the instructor.

GEOG 935 Seminar in Soil Geography. (2-3)  
Subject matter varies but focuses on modern concepts and trends in soil geography. Sample topics include classification, paleopedology, and soil genesis. Field trip may be required.  
Prerequisite: GEOG 735 or consent of the instructor.

GEOG 958 Seminar in Geographic Information Systems. (2-4)  
Study of selected topics in analysis of digital geographic data. May include research and/or developmental work.  
Prerequisite: GEOG 758 or equivalent, or consent of the instructor.

GEOG 970 Seminar in Cultural Geography. (2-3)  
Study of selected topics in the theory and method of cultural geography. Samples include religious patterns, folk architecture, and place-defining novels. Topics will be specified in advance.

GEOG 972 Seminar in Political Geography. (2-3)  
Study of selected topics in the theory and method of political geography. Samples include insurgent states, electoral patterns, and political ecology. Topic will be specified in advance.  
Prerequisite: GEOG 772 or consent of instructor.

GEOG 980 Seminar in Geography: ______________. (1-3)

GEOG 990 Seminar in Regional Geography: ______________. (Selected areas to be specified). (1-3)

GEOG 998 Research in Geography. (1-5)

GEOG 999 Doctoral Dissertation. (1-10)

February 2017