MASTER OF SCIENCE (M.S.) MAJOR IN GEOGRAPHY

Program Overview
The Master of Science (M.S.) degree with a major in Geography is designed to give highly qualified students exposure to geographic theory and research at the pre-doctoral level. Programmatic emphases include Environmental Geography, Geographic Education, Geographic Information Science, and other specialty areas in geography represented by the current active research interests of the faculty.

Financial Assistance
Graduate assistantships are available to qualified candidates. Please contact the graduate program coordinator in the Department of Geography for more information about financial assistance and the degree programs. For scholarship information, please visit The Graduate College website at http://www.gradcollege.txstate.edu/funding.html.

Application Requirements
The items listed below are required for admission consideration for applicable semesters of entry during the current academic year. Submission instructions, additional details, and changes to admission requirements for semesters other than the current academic year can be found on The Graduate College's website (http://www.gradcollege.txstate.edu). International students should review the International Admission Documents webpage (http://mycatalog.txstate.edu/graduate/admission-documents/international/) for additional requirements.

- completed online application
- $55 nonrefundable application fee
  or
- $90 nonrefundable application fee for applications with international credentials
- baccalaureate degree from a regionally accredited university
- official transcripts from each institution where course credit was granted
- background course work
- minimum 3.4 GPA in the last 60 hours of undergraduate course work (plus any completed graduate courses)
- GRE (general test only) with competitive scores in the verbal reasoning and quantitative reasoning sections
- resume/CV
- statement of purpose identifying the student's preferred degree and concentration and possible areas of research
- three letters of recommendation

TOEFL, PTE, or IELTS Scores
Non-native English speakers who do not qualify for an English proficiency waiver:

- official TOEFL iBT scores required with a 78 overall
- official PTE scores required with a 52

This program does not offer admission if the scores above are not met.

Degree Requirements
The Master of Science (M.S.) degree with a major in Geography requires 30 semester credit hours, including a thesis. Students who do not have the appropriate background course work may be required to complete leveling courses.

Course Requirements

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEO 5301</td>
<td>Multivariate Quantitative Methods</td>
<td>3</td>
</tr>
<tr>
<td>GEO 5309</td>
<td>Geographical Analysis</td>
<td>3</td>
</tr>
<tr>
<td>GEO 7300</td>
<td>Advanced Geographic Research Design</td>
<td>3</td>
</tr>
</tbody>
</table>

Prescribed Electives
Choose 9 hours of electives from following:

- GEO 5308 Regional Field Studies
- GEO 5312 Managing Urbanization
- GEO 5313 Environmental Management
- GEO 5314 Geographic Elements of Environmental Law
- GEO 5316 Applied Physical Geography
- GEO 5317 Seminar in Applied Human Geography
- GEO 5318 Environment Problems of the U.S.-Mexico Border
- GEO 5319 Seminar in Nature and Heritage Tourism
- GEO 5322 Interpretive Environmental Geography
- GEO 5323 Location Analysis
- GEO 5326 Parks and Protected Places
- GEO 5329 Historical Geography of the Environment
- GEO 5330 Geography of Hazards
- GEO 5332 Environmental Geography of the Coastal Zone
- GEO 5334 Applied Water Resources
- GEO 5336 Transportation Systems
- GEO 5339 The Geography of Land Management
- GEO 5340 Active Learning in Geography
- GEO 5341 Contemporary Issues in Geographic Education
- GEO 5342 Theory and Research Methods in Geographic Education
- GEO 5343 Technology in Geographic Education
- GEO 5344 Curriculum, Standards, and Assessments in Geography
- GEO 5349 Population Geography
- GEO 5351 Regional Waste Management
- GEO 5352 Air Quality Management
- GEO 5353 Emergency Management
- GEO 5360 Seminar in Planning Problems
- GEO 5367 Exploring Spatial Databases
- GEO 5370 Seminar in Applied Physical Geography
- GEO 5380 Internship
- GEO 5390 Independent Study
- GEO 5395 Problems in Applied Geography
- GEO 5408 Web Mapping
Choose 6 hours from the following:

- GEO 5415 Geographic Applications of Remote Sensing
- GEO 5417 Advanced Cartographic Design
- GEO 5418 Geographic Information Systems I
- GEO 5419 Geographic Information Systems II
- GEO 5424 GPS and GIS
- GEO 5430 Field Methods
- GEO 5680 Internship

Choose a minimum of 3 hours from the following:

- GEO 5199B Thesis
- GEO 5299B Thesis
- GEO 5399B Thesis
- GEO 5599B Thesis
- GEO 5999B Thesis

Total Hours: 30

Comprehensive Examination Requirement

Students are required to take a comprehensive examination. The committee evaluates the comprehensive examination. The research advisor fills out the report of the comprehensive examination form and forwards this to the Graduate Staff Advisor, who then forwards the form to the Graduate College.

In evaluating the examination, the committee has two options: pass or fail. Students who fail the examination may also be required by their committees to complete additional course work or undertake research projects. These must be completed to the satisfaction of the committee before the examination is retaken. A student who has failed the comprehensive examination is eligible to retake the comprehensive examination once. Unless under extenuating circumstances and with the approval of the Graduate Program Coordinator, the second examination must take place no sooner than thirty days after the first comprehensive examination. A student who fails the comprehensive examination twice is dismissed from the graduate program.

If a student elects to follow the thesis option for the degree, a committee to direct the written thesis will be established. The thesis must demonstrate the student’s capability for research and independent thought. Preparation of the thesis must be in conformity with the Graduate College Guide to Preparing and Submitting a Thesis or Dissertation.


The student must submit an official Thesis Proposal Form (http://www.gradcollege.txstate.edu/forms.html) and proposal to his or her thesis committee. Thesis proposals vary by department and discipline. Please see your department for proposal guidelines and requirements. After signing the form and obtaining committee members’ signatures, the graduate advisor’s signature if required by the program and the department chair’s signature, the student must submit the Thesis Proposal Form with one copy of the proposal attached to the dean of The Graduate College for approval before proceeding with research on the thesis. If the thesis research involves human subjects, the student must obtain exemption or approval from the Texas State Institutional Review Board prior to submitting the proposal form to The Graduate College. The IRB approval letter should be included with the proposal form. If the thesis research involves vertebrate animals, the proposal form must include the Texas State IACUC approval code. It is recommended that the thesis proposal form be submitted to the dean of The Graduate College by the end of the student’s enrollment in 5399A. Failure to submit the thesis proposal in a timely fashion may result in delayed graduation.
Thesis Committee
The thesis committee must be composed of a minimum of three approved graduate faculty members.

Thesis Enrollment and Credit
The completion of a minimum of six hours of thesis enrollment is required. For a student’s initial thesis course enrollment, the student will need to register for thesis course number 5399A. After that, the student will enroll in thesis B courses, in each subsequent semester until the thesis is defended with the department and approved by The Graduate College. Preliminary discussions regarding the selection of a topic and assignment to a research supervisor will not require enrollment for the thesis course.

Students must be enrolled in thesis credits if they are receiving supervision and/or are using university resources related to their thesis work. The number of thesis credit hours students enroll in must reflect the amount of work being done on the thesis that semester. It is the responsibility of the committee chair to ensure that students are making adequate progress toward their degree throughout the thesis process. Failure to register for the thesis course during a term in which supervision is received may result in postponement of graduation. After initial enrollment in 5399A, the student will continue to enroll in a thesis B course as long as it takes to complete the thesis. Thesis projects are by definition original and individualized projects. As such, depending on the topic, methodology, and other factors, some projects may take longer than others to complete. If the thesis requires work beyond the minimum number of thesis credits needed for the degree, the student may enroll in additional thesis credits at the committee chair’s discretion. In the rare case when a student has not previously enrolled in thesis and plans to work on and complete the thesis in one term, the student will enroll in both 5399A and 5399B.

The only grades assigned for thesis courses are PR (progress), CR (credit), W (withdrawn), and F (failing). If acceptable progress is not being made in a thesis course, the instructor may issue a grade of F. If the student is making acceptable progress, a grade of PR is assigned until the thesis is completed. The minimum number of hours of thesis credit (“CR”) will be awarded only after the thesis has been both approved by The Graduate College and released to Alkek Library.

A student who has selected the thesis option must be registered for the thesis course during the term or Summer I (during the summer, the thesis course runs ten weeks for both sessions) in which the degree will be conferred.

Thesis Deadlines and Approval Process
Thesis deadlines are posted on The Graduate College (http://www.gradcollege.txstate.edu/) website under “Current Students.” The completed thesis must be submitted to the chair of the thesis committee on or before the deadlines listed on The Graduate College website.

The following must be submitted to The Graduate College by the thesis deadline listed on The Graduate College website:

1. The Thesis Submission Approval Form bearing original (wet) and/or electronic signatures of the student and all committee members.
2. One (1) PDF of the thesis in final form, approved by all committee members, uploaded in the online Vireo submission system.

After the dean of The Graduate College approves the thesis, Alkek Library will harvest the document from the Vireo submission system for publishing in the Digital Collections database (according to the student’s embargo selection). NOTE: MFA Creative Writing theses will have a permanent embargo and will never be published to Digital Collections.

While original (wet) signatures are preferred, there may be situations as determined by the chair of the committee in which obtaining original signatures is inefficient or has the potential to delay the student’s progress. In those situations, the following methods of signing are acceptable:

• signing and faxing the form
• signing, scanning, and emailing the form
• notifying the department in an email from their university’s or institution’s email account that the committee chair can sign the form on their behalf
• electronically signing the form using the university’s licensed signature platform.

If this process results in more than one document with signatures, all documents need to be submitted to The Graduate College together.

No copies are required to be submitted to Alkek Library. However, the library will bind copies submitted that the student wants bound for personal use. Personal copies are not required to be printed on archival quality paper. The student will take the personal copies to Alkek Library and pay the binding fee for personal copies.

Master’s level courses in Geography: GEO

Courses Offered
Geography (GEO)

GEO 5190. Independent Study.
Individual study under direct supervision of a professor. May involve geographic field trips. GEO 5190, GEO 5290, and GEO 5390 may be taken for a total of six semester hours of credit. Prerequisite: Instructor approval.
1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Standard Letter

GEO 5199B. Thesis.
This course represents a student’s continuing thesis enrollments. The student continues to enroll in this course until the thesis is submitted for binding.
1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Credit/No Credit

GEO 5290. Independent Study.
Individual study under direct supervision of a professor. May involve geographic field trips. GEO 5190, GEO 5290, and GEO 5390 may be taken for a total of six semester hours of credit. Prerequisite: Instructor approval.
2 Credit Hours. 2 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Standard Letter
GEO 5299B. Thesis.
This course represents a student's continuing thesis enrollments. The student continues to enroll in this course until the thesis is submitted for binding.
2 Credit Hours. 2 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Credit/No Credit

Students will be introduced to appropriate research methods for applied geographers. Emphasis will be placed on the scientific method, productive library research, data collection and analysis, fieldwork, effective writing, and the nature of graphic representation.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

GEO 5301. Multivariate Quantitative Methods.
The use of multivariate descriptive and inferential statistics as applied to geographic data and problems, beginning with the general linear model and including topics such as multiple regression, principal components analysis, discriminant analysis, and clustering algorithms. Prerequisite: GEO 3301 with a grade of "D" or better.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

GEO 5302. Qualitative Research Methods.
This course introduces the qualitative research paradigm, including research design, methods of data collection, and inductive analysis. Standards of scientific research that call for a deeper evaluation of complex social relationships are emphasized. The focus and application will be oriented towards human geography and nature-society relations.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

GEO 5303. Regional Field Studies.
Study of geographic phenomena during field excursions to a particular site or region. Students will study the physical and/or cultural environments through off-campus field experience. Students will research, analyze, and report on major regional geographic features. Repeatable once for additional credit with a different site or region. (MULT).
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Standard Letter

An analysis of the major causes of environmental deterioration together with the basic strategies of dealing with these problems.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

A survey of environmental laws related to land, air, and water pollution. The nature of environmental problems will be studied as they relate to urbanization, industrialization, land development, noise, radiation and solid waste management, and the laws and guidelines that have been passed to alleviate such problems.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

GEO 5306. Applied Physical Geography.
This course is a survey of physical geography, geographic education, land use and regional development, and cartographic representation and geographic information theory.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

GEO 5307. Seminar in Applied Human Geography.
A focus on the methods and techniques used in the collection, analysis, and evaluation of information relating to problems within the human geographical environment. Emphasis will be on problems pertaining to particular geographic locations or special environmental settings. Repeatable once for additional credit with a different topic.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Standard Letter
This course serves as an in-depth introduction to the physical, social, and environmental landscapes of the region of the U.S.-Mexico Border. The course applies an interdisciplinary perspective to geographic understanding of the environmental and health-related issues experienced by residents of the borderlands. Special attention is given to management and planning solutions to the region's problems. (MULT).
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Multicultural Content
Grade Mode: Standard Letter

GEO 5319. Seminar in Nature and Heritage Tourism.
This seminar focuses on the special geographic issues of nature and heritage tourism. Particular emphasis is placed on sites and activities, costs and benefits, commoditization and authenticity, resource protection, and substantive learning content of nature and heritage tourism activities.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

GEO 5322. Interpretive Environmental Geography.
Students learn to use geographic theories and concepts to provide holistic and thematic interpretation of environmental information, as specified by interpretive principles. Students also learn advanced use of traditional and digital presentation techniques and research methods, which include audience assessment and program evaluation.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

GEO 5323. Location Analysis.
Factors of importance in the decision-making process of locating both public and private sector facilities. Attention will be paid to the location of manufacturing activities, commercial enterprises, and a variety of social service facilities.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

GEO 5326. Parks and Protected Places.
This course serves as an in-depth introduction to the philosophy, establishment, and operation of public parks, wildlife refuges, protected areas, non-governmental preserves and historic sites. Students will be introduced to the scientific and policy rationale for the creation of such areas as well as methods of classification and acquisition.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

GEO 5329. Historical Geography of the Environment.
This course examines the evolution of environmental problems using the techniques and analytical perspectives of historical geography. Special emphasis is given to the emergence of environmental challenges related to urbanization and climate change. Students in this class will engage with scholarship related to historical geography of the environment and develop original research related to environmental change.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

GEO 5330. Geography of Hazards.
This course focuses on understanding and advancing scholarship in hazards research – the threats to life, health, and welfare caused by natural, technological, and/or social processes, and disasters. Special emphasis is placed on understanding the complexities of the assessment and management of risks, hazards, and disasters at multiple geographic scales.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

GEO 5332. Environmental Geography of the Coastal Zone.
Investigation of the physical geographic factors associated with the coastal zone and the role of human activities in problems and opportunities characteristic of this environment.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

GEO 5334. Applied Water Resources.
Application of techniques employed in water management including flood hazards, water supply assessment, and water management strategies. Students will apply principles to specific watersheds and water problems including the analysis of various physical, land use, and legal parameters.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

GEO 5335. Directed Research.
This course is directed research on various topics in applied geography under the supervision of a graduate faculty member. Students gain experience about the entire process of conducting applied research in geography. Students receive course credit after a directed research report is approved by a student's advisor and members of the student's committee.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

GEO 5336. Transportation Systems.
This course introduces key concepts and methods of transportation geography and transportation planning. Topics include, among others, the spatial structure of transportation systems, transportation economics, and logistics. Various methods, techniques, and technologies for transportation analysis, particularly Geographic Information Systems (GIS), will be explored and applied as part of the course.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

GEO 5339. The Geography of Land Management.
This course explores U.S. land management philosophies, techniques, and development approaches. Major topics include land ethics/philosophies, U.S. traditions in cadastral geography, urban sprawl and green development, land conservation techniques, the role of local/state/federal regulations in land management, and the human environmental impacts of land development.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
GEO 5340. Active Learning in Geography. 
The course focuses on instructional strategies that will allow teachers to promote active learning in geography. Emphasis will be on how active learning can help students reach geography content and skills standards. 
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours. 
Grade Mode: Standard Letter

GEO 5341. Contemporary Issues in Geographic Education. 
This course examines current approaches to teaching geography in American education. Specific attention will be given to new classroom materials, curriculum reform efforts, and research developments. 
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours. 
Grade Mode: Standard Letter

GEO 5342. Theory and Research Methods in Geographic Education. 
The course focuses on designing, conducting, and presenting empirical research on teaching and learning geography. This course emphasizes the critical analysis of theories, research methods, and key research questions in geographic education and developing a research proposal. 
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours. 
Grade Mode: Standard Letter

GEO 5344. Curriculum, Standards, and Assessments in Geography. 
This course is a survey of major curriculum and assessment theories and practices in geography education. Geography is examined as a school subject that is part of the social studies, as an element of interdisciplinary studies, and as a stand-alone subject. The concept of teacher leadership frame discussions of geography subject matter and standards implementation in schools. 
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours. 
Grade Mode: Standard Letter

GEO 5345. Spatial Thinking in Education. 
This course introduces the concept of spatial thinking and discusses how spatial thinking may be taught in the context of K-16 education. Students examine various instructional strategies to facilitate spatial thinking in the classroom and design grade-level appropriate learning experiences. 
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours. 
Grade Mode: Standard Letter

GEO 5346. Inquiry-Based Teaching in Human Geography. 
This course introduces models of geographic inquiry for instruction in human geography at the secondary and postsecondary levels. Case studies examining contemporary issues will be paired with lessons and activities that support integrated and inquiry-based approaches to teaching human geography. Students develop inquiry lessons aligned with geography/social studies standards, the Advanced Placement Human Geography course, and introductory undergraduate courses in human geography. 
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours. 
Grade Mode: Standard Letter

GEO 5349. Population Geography. 
An in-depth study of the spatial distribution and movement of human populations. Course will emphasize current issues and analytical techniques. Topics will include the impact of population growth, spatial diffusion processes, migration trends and theories, explanation of regional demographic differences, and techniques such as population projections. (MULT). 
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours. 
Course Attribute(s): Multicultural Content 
Grade Mode: Standard Letter

GEO 5350. Practicum in Teaching Geography. 
This course introduces key concepts in teaching geography and provides regular training and planned periodic evaluations of instructional responsibilities. Course topics include instructional and assessment strategies in geography and classroom management. This course is required for first-year instructional assistants in the Geography Department. Students do not earn graduate degree credit. 
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours. 
Course Attribute(s): Exclude from 3-peat Processing|Graduate Assistantship|Exclude from Graduate GPA 
Grade Mode: Leveling/Assistantships

GEO 5351. Regional Waste Management. 
The principles of effective solid waste planning and management will be examined as they relate to such activities as waste generation, storage and collection, transfer and transportation, processing and volume reduction, resource conservation and recovery, the disposal of wastes, and the handling of special wastes, particularly those of a toxic and hazardous nature. 
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours. 
Grade Mode: Standard Letter

GEO 5352. Air Quality Management. 
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours. 
Grade Mode: Standard Letter

This course provides an overview of the most important aspects of emergency management at all geographic scales, with emphasis on local, regional, and federal levels. Best practices and proper methodologies are emphasized as well as ways that students can develop the skills and capabilities for a career in this field. 
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours. 
Grade Mode: Standard Letter

GEO 5360. Seminar in Planning Problems. 
A critical and in-depth examination of several problem areas currently facing the planner. 
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours. 
Grade Mode: Standard Letter
GEO 5367. Exploring Spatial Databases.  
This course covers principles of spatial ontologies and spatial semantics to facilitate appropriate database conceptualization, design and implementation. Course assignments and projects provide in-depth experience with database query languages. Course work is completed using a spatially-enabled Relational Database Management Systems (RDBMS). Prerequisite: GEO 5418 or equivalent with a grade of ‘B’ or better.  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Grade Mode: Standard Letter

GEO 5370. Seminar in Applied Physical Geography.  
Critical analysis of theories, models, and techniques of physical geographic research with the focus on application to real-world problems. Repeatable once for additional credit with a different topic.  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Course Attribute(s): Exclude from 3-peat Processing  
Grade Mode: Standard Letter

GEO 5371. Seminar in Geographic Education.  
This research seminar addresses contemporary topics related to geographic education. The emphasis is on applications of learning theories, teaching strategies, and innovative tools in geography classrooms. Course topics may vary depending on student and faculty interest. Repeatable once for additional credit with a different topic.  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Course Attribute(s): Exclude from 3-peat Processing  
Grade Mode: Standard Letter

GEO 5380. Internship.  
Application of techniques of applied geography in an actual on-the-job setting. Internships will be arranged and supervised by the Internship Director. May be repeated once for additional credit.  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Course Attribute(s): Exclude from 3-peat Processing  
Grade Mode: Credit/No Credit

GEO 5390. Independent Study.  
Individual study under direct supervision of a professor. May involve geographic field trips. GEO 5190, GEO 5290, and GEO 5390 may be taken for a total of six semester hours of credit.  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Course Attribute(s): Exclude from 3-peat Processing  
Grade Mode: Standard Letter

GEO 5393B. Biogeography in Mountain Environments.  
This course examines how plants and animals interact with and affect geomorphological processes and landforms, and how geomorphological processes, landforms and geological factors affect spatial distribution of animals and plants; all within the environmental limitation and conditions of mountains. The role of humans in affecting these interrelationships will be emphasized.  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Course Attribute(s): Exclude from 3-peat Processing  
Grade Mode: Standard Letter

GEO 5393D. Water Resource Planning.  
This seminar presents case-studies related to water quality protection and mitigation and to the planning of water supply at the state and regional level from a policy practitioner’s perspective. The objective of the course is to identify the components of the planning process and its outcomes, including water-use conservation.  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Course Attribute(s): Exclude from 3-peat Processing  
Grade Mode: Standard Letter

GEO 5393E. Geomorphology in the Anthropocene.  
This course will examine the ways in which humans interact with and affect geomorphological processes and landforms, and how humans directly act as geomorphological agents. The level at which human activities have transformed the surface of the Earth will be examined.  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Course Attribute(s): Exclude from 3-peat Processing  
Grade Mode: Standard Letter

GEO 5393F. Jobs, Careers, and Professional Development in Geography.  
This course introduces graduate students to research-based strategies for career planning and professional development in geography. Career opportunities for geographers in business, government, nonprofit, and academic organizations are examined. The course also analyzes professional identities, applications of geography in society, professional ethics, lifelong learning, work-life balance, and professional networking.  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Course Attribute(s): Exclude from 3-peat Processing  
Grade Mode: Standard Letter

GEO 5393G. Jobs, Careers, and Professional Development in Geography.  
This course introduces graduate students to research-based strategies for career planning and professional development in geography. Career opportunities for geographers in business, government, nonprofit, and academic organizations are examined. The course also analyzes professional identities, applications of geography in society, professional ethics, lifelong learning, work-life balance, and professional networking.  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Course Attribute(s): Exclude from 3-peat Processing  
Grade Mode: Standard Letter

GEO 5393H. Professional Development in Geographic Education.  
This course combines useful, dynamic geography content with a sensible professional development online delivery system. The content emphasis stresses the applicability of geography in our modern world thus offering jobs and careers to students. The message for teachers is that geography has become more oriented to student aspirations and civic and environmental responsibility.  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Course Attribute(s): Exclude from 3-peat Processing  
Grade Mode: Standard Letter

GEO 5393I. Geography and the Social Studies.  
This course examines on how geography fits within the social studies. It details how geography can be taught alongside history, economics, and civics for a well-rounded social studies curriculum. Attention is paid to technology, skills and perspectives. The course examines various social studies frameworks and standards. This course will prepare teachers to be versatile in their social studies knowledge and understanding. It will enhance a teacher’s ability to teach geography across all of the social studies subjects.  
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.  
Course Attribute(s): Exclude from 3-peat Processing  
Grade Mode: Standard Letter
**GEO 5393K. Advanced Web Cartography and Data Visualization.**
This course provides advanced training in the design and development of interactive, web-based data visualization systems with emphasis on the modern cartographic process and the spatial applications of interactive data visualization principles.

**3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.**

**Course Attribute(s): Exclude from 3-peat Processing|Topics**

**Grade Mode:** Standard Letter

**GEO 5395. Problems in Applied Geography.**
Designed to consider a selected topic relating to applied geography. Emphasis on the practical application of geographic tools, with individual or group participation in a specific project. Course topics may vary depending on student and faculty interests and may apply to any of the four graduate tracks: physical-environmental, urban and regional planning, geographic education or GIScience. Repeatable for up to six hours.

**3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.**

**Course Attribute(s): Exclude from 3-peat Processing**

**Grade Mode:** Standard Letter

**GEO 5399A. Thesis.**
This course represents a student’s initial thesis enrollment. No thesis credit is awarded until student has completed the thesis in GEO 5399B.

**3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.**

**Grade Mode:** Credit/No Credit

**GEO 5399B. Thesis.**
This course represents a student’s continuing thesis enrollments. The student continues to enroll in this course until the thesis is submitted for binding.

**3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.**

**Course Attribute(s): Exclude from 3-peat Processing**

**Grade Mode:** Credit/No Credit

**GEO 5408. Web Mapping.**
This course introduces students to modern interactive and dynamic mapping and GIS techniques that allow internet-based cartographic representations of temporal and non-temporal geospatial objects and phenomena. Prerequisite: GEO 3411 with a grade of "C" or better.

**4 Credit Hours. 2 Lecture Contact Hours. 4 Lab Contact Hours.**

**Course Attribute(s): Lab Required**

**Grade Mode:** Standard Letter

**GEO 5415. Geographic Applications of Remote Sensing.**
Students will focus on Geographic applications of the principles and practices of digital image processing, classification, and modeling using satellite images.

**4 Credit Hours. 2 Lecture Contact Hours. 4 Lab Contact Hours.**

**Course Attribute(s): Lab Required**

**Grade Mode:** Standard Letter

**GEO 5417. Advanced Cartographic Design.**
This advanced course in cartography focuses on thematic map design. The objective is to produce a series of well-designed, professional grade maps (or an atlas) that students can use to build a cartographic portfolio. Theoretical concepts and principles will be introduced using practical examples and written assignments. Prerequisite: GEO 3411 with a grade of "D" or better or instructor approval.

**4 Credit Hours. 2 Lecture Contact Hours. 4 Lab Contact Hours.**

**Course Attribute(s): Lab Required**

**Grade Mode:** Standard Letter

**GEO 5418. Geographic Information Systems I.**
Course is concerned with the analysis and interpretation of maps stored in digital form. Students are introduced to concepts and practices involving computerized cartographic and geographic data input, storage and retrieval, data manipulation and analysis, graphic and tabular report generation, and cartographic modeling.

**4 Credit Hours. 2 Lecture Contact Hours. 4 Lab Contact Hours.**

**Course Attribute(s): Lab Required**

**Grade Mode:** Standard Letter

**GEO 5419. Geographic Information Systems II.**
This course aims to develop more advanced GIS concepts and application issues, further spatial data manipulation and analysis skills, and provide hands-on experience with GIS hardware and software programs. The emphasis will be on practical application of skills to real world issues. Prerequisite: GEO 5418 with a grade of "C" or better.

**4 Credit Hours. 2 Lecture Contact Hours. 4 Lab Contact Hours.**

**Course Attribute(s): Lab Required**

**Grade Mode:** Standard Letter

**GEO 5424. GPS and GIS.**
Students will learn to plan and conduct fieldwork using Global Positioning System (GPS) to differentially correct GPS data, and to build Geographic Information Systems (GIS) applications using GPS technology. The course is project-based and involves working with external clients(s). Prerequisites: GEO 2426 with a grade of "D" or better or GEO 5418 with a grade of "C" or better.

**4 Credit Hours. 2 Lecture Contact Hours. 4 Lab Contact Hours.**

**Course Attribute(s): Lab Required**

**Grade Mode:** Standard Letter

**GEO 5430. Field Methods.**
Course will emphasize common field techniques necessary in the construction of accurate maps. Various kinds of data collection techniques will be presented that will facilitate geographic research. Prerequisite: GEO 3301 with a grade of "D" or better.

**4 Credit Hours. 2 Lecture Contact Hours. 4 Lab Contact Hours.**

**Course Attribute(s): Lab Required**

**Grade Mode:** Standard Letter

**GEO 5447. Technology in Geographic Education.**
The course focuses on the applications and implications of technology in geographic education. The emphasis is placed on the role of technology as an instructional tool to promote inquiry-based learning.

**3 Credit Hours. 3 Lecture Contact Hours. 1 Lab Contact Hour.**

**Grade Mode:** Standard Letter
GEO 5599B. Thesis.
This course represents a student's continuing thesis enrollments. The student continues to enroll in this course until the thesis is submitted for binding.

5 Credit Hours. 5 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Credit/No Credit

GEO 5680. Internship.
Application of techniques of applied geography in an actual on-the-job setting. Internships will be arranged and supervised by the Internship Director.

6 Credit Hours. 6 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Credit/No Credit

GEO 5999B. Thesis.
This course represents a student's continuing thesis enrollments. The student continues to enroll in this course until the thesis is submitted for binding.

9 Credit Hours. 9 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Credit/No Credit