

## Program Overview

The Master of Applied Geography (M.A.Geo.) degree program is designed to prepare geographers to use their skills and background knowledge to solve real-world problems with geographic dimensions. Applied Geography includes such sub-fields as Environmental Management, Geographic Education, GIS, Cartography, Land use Planning, Location Analysis, Land Management, Transportation Systems Planning, Applied Physical Geography, Geographic Aspects of Environmental Law, and Spatial Modeling.

## 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 page (<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 (Non-U.S. degrees must be equivalent to a four-year U.S. Bachelor's degree. In most cases, three-year degrees are not considered. Visit our International FAQs (<https://www.gradcollege.txst.edu/international/faqs.html>) for more information.)
- official transcripts from **each institution** where course credit was granted
- **Fall 2024: overall** minimum 3.2 GPA or 3.2 GPA in the last 60 hours of undergraduate course work (plus any completed graduate courses)
- **Spring 2025 and beyond: overall minimum 3.0 GPA or 3.0 GPA in the last 60 hours of undergraduate course work (plus any completed graduate courses)**
- background course work
- GRE not required
- resume/CV
- statement of purpose identifying the student's preferred degree and concentration and possible areas of research
- three letters of recommendation

### Approved English Proficiency Exam Scores

Applicants are required to submit an approved English proficiency exam score that meets the minimum program requirements below unless they have earned a bachelor's degree or higher from a regionally

accredited U.S. institution or the equivalent from a country on our exempt countries list (<http://www.gradcollege.txstate.edu/international/language.html#waiver>).

- official TOEFL iBT scores required with a 78 overall
- official PTE scores required with a 52
- official IELTS (academic) scores required with a 6.5 overall and minimum individual module scores of 6.0
- [official Duolingo Scores required with a 110 overall](#)
- [official TOEFL Essentials scores required with an 8.5 overall](#)

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

## Degree Requirements

The Master of Applied Geography (M.A.Geo.) degree with a major in Natural Resources and Environmental Studies requires 33 semester credit hours. Students who do not have the appropriate background course work may be required to complete leveling courses.

## Course Requirements

Code	Title	Hours
<b>Required Courses</b>		
GEO 5300	Applied Research Design and Techniques	3
GEO 5301	Multivariate Quantitative Methods	3
or GEO 5304	Qualitative Research Methods	
GEO 5309	Geographical Analysis	3
GEO 5335	Directed Research	3
<b>Concentration</b>		
GEO 5313	Environmental Studies	3
GEO 5314	Geographic Elements of Environmental Law	3
Choose 9 hours from the following:		9
GEO 5308	Regional Field Studies	
GEO 5312	Managing Urbanization	
GEO 5315	Geographic Analysis of Global Issues	
GEO 5316	Applied Physical Geography	
GEO 5317	Seminar in Applied Human Geography	
GEO 5318	Environment Problems of the U.S.-Mexico Border	
GEO 5322	Interpretive Environmental Geography	
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 5349	Population Geography	
GEO 5351	Regional Waste Management	
GEO 5352	Air Quality Management	
GEO 5353	Emergency Management	
GEO 5370	Seminar in Applied Physical Geography	
GEO 5390	Independent Study	
GEO 5415	Geographic Applications of Remote Sensing	
GEO 5418	Geographic Information Systems I	
GEO 5419	Geographic Information Systems II	

GEO 5424	GPS and GIS
GEO 5430	Field Methods
<b>Prescribed Electives</b>	
Choose 6 hours from the following: 6	
GEO 5308	Regional Field Studies
GEO 5312	Managing Urbanization
GEO 5313	Environmental Studies
GEO 5314	Geographic Elements of Environmental Law
GEO 5315	Geographic Analysis of Global Issues
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	Researching the City
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 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
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

May choose 3 hours of advisor-approved electives from outside the department

**Total Hours**

**33**

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.

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 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

## Comprehensive Examination Requirement

Students are required to take a comprehensive examination. The committee evaluates the comprehensive examination. The research

**GEO 5300. Applied Research Design and Techniques.**

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 5304. 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 5308. 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|Multicultural Content

**Grade Mode:** Standard Letter

**GEO 5309. Geographical Analysis.**

A survey of typical spatial problems of interest to geographers, with emphasis on current research and application being undertaken by the faculty in the Department of Geography. Topics include environmental 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 5312. Managing Urbanization.**

Survey methods and procedures related to managing and preparing for urban growth. Selected topics for examination include transportation planning, housing, historic preservation, and environmental design. (MULT).

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

**Course Attribute(s):** Multicultural Content

**Grade Mode:** Standard Letter

**GEO 5313. Environmental Studies.**

A critical analysis of the major causes of environmental change and human response to environmental problems.

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

**Grade Mode:** Standard Letter

**GEO 5314. Geographic Elements of Environmental Law.**

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 5315. Geographic Analysis of Global Issues.**

This course focuses on a critical analysis of contemporary global or regional issues from geographic perspectives. The course emphasizes research-based case studies associated with the topics and integrative approaches to the study of world regions and world cultures. The course may be repeated with permission of the instructor.

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

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

**Grade Mode:** Standard Letter

**GEO 5316. Applied Physical Geography.**

This course is a survey of methods and techniques used in the collection, analysis, and evaluation of information relating to problems within the physical environment. Emphasis will be on problems characteristic of particular geographic locations or specific 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

**GEO 5317. 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

**GEO 5318. Environment Problems of the U.S.-Mexico Border.**

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. Researching the City.**

This course covers data collection and analysis of urban life and the factors considered in locating industry, business, housing, and community 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.**

A geographic assessment of air quality management in the United States. Spatial distribution of the types, sources, and effects of air pollutants. Meteorology and physics of air pollution dispersion. Legislative and regulatory approaches to pollution management. National, state, regional, and local policy development procedures. Geographic methods for air pollution management.

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

**Grade Mode:** Standard Letter

**GEO 5353. Emergency Management.**

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 5365. Remote Sensing and the Environment.**

This course provides an examination and implementation of sophisticated approaches for processing satellite digital images with emphasis on environmental applications.

**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 5368. Lidar and SfM Data Processing and Analysis.**

This course covers Light Detection and Ranging (lidar) systems and Structure from Motion (SfM) workflows for mapping and analysis of the environment. Students learn to successfully apply knowledge of lidar data and SfM workflows for a variety of Geographic Information Science applications.

**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|Topics

**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|Topics

**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|Topics

**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|Topics

**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|Topics

**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|Topics

**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.**

**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.

**4 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