MASTER OF APPLIED GEOGRAPHY (M.A.GEO.) MAJOR IN GEOGRAPHIC INFORMATION SCIENCE

Major Program
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 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
- minimum 3.2 GPA in the last 60 hours of undergraduate course work (plus any completed graduate courses)
- background course work
- official 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 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 IELTS (academic) scores required with a 6.5 overall and minimum individual module scores of 6.0

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 Geography Information Science requires 33 semester credit hours. 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>
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<tbody>
<tr>
<td>GEO 5300</td>
<td>Applied Research Design and Techniques</td>
<td>3</td>
</tr>
<tr>
<td>GEO 5301</td>
<td>Multivariate Quantitative Methods</td>
<td>3</td>
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<td>GEO 5309</td>
<td>Geographical Quantitative Methods</td>
<td>3</td>
</tr>
<tr>
<td>GEO 5335</td>
<td>Directed Research</td>
<td>3</td>
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**Concentration**
Choose 12 hours from the following:

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<tr>
<td>GEO 5408</td>
<td>Web Mapping</td>
</tr>
<tr>
<td>GEO 5415</td>
<td>Geographic Applications of Remote Sensing</td>
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<tr>
<td>GEO 5417</td>
<td>Advanced Cartographic Design</td>
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<tr>
<td>GEO 5419</td>
<td>Geographic Information Systems II</td>
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<tr>
<td>GEO 5424</td>
<td>GPS and GIS</td>
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**Electives**
Choose 9 hours from the following:

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<tbody>
<tr>
<td>GEO 5308</td>
<td>Regional Field Studies</td>
</tr>
<tr>
<td>GEO 5312</td>
<td>Managing Urbanization</td>
</tr>
<tr>
<td>GEO 5313</td>
<td>Environmental Management</td>
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<tr>
<td>GEO 5314</td>
<td>Geographic Elements of Environmental Law</td>
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<tr>
<td>GEO 5316</td>
<td>Applied Physical Geography</td>
</tr>
<tr>
<td>GEO 5317</td>
<td>Seminar in Applied Human Geography</td>
</tr>
<tr>
<td>GEO 5318</td>
<td>Environment Problems of the U.S.-Mexico Border</td>
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<td>GEO 5319</td>
<td>Seminar in Nature and Heritage Tourism</td>
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<td>GEO 5322</td>
<td>Interpretive Environmental Geography</td>
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<td>GEO 5323</td>
<td>Location Analysis</td>
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<td>GEO 5326</td>
<td>Parks and Protected Places</td>
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<td>GEO 5329</td>
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<tr>
<td>GEO 5330</td>
<td>Geography of Hazards</td>
</tr>
<tr>
<td>GEO 5332</td>
<td>Environmental Geography of the Coastal Zone</td>
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<tr>
<td>GEO 5334</td>
<td>Applied Water Resources</td>
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<tr>
<td>GEO 5336</td>
<td>Transportation Systems</td>
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<tr>
<td>GEO 5339</td>
<td>The Geography of Land Management</td>
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<td>GEO 5340</td>
<td>Active Learning in Geography</td>
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<tr>
<td>GEO 5341</td>
<td>Contemporary Issues in Geographic Education</td>
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<td>GEO 5342</td>
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<td>GEO 5343</td>
<td>Technology in Geographic Education</td>
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<tr>
<td>GEO 5344</td>
<td>Seminar in Geographic Curriculum</td>
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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 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 6 hours of advisor-approved electives outside the department

Total Hours 33

Comprehensive Examination Requirements
All candidates for graduate degrees must pass one or more comprehensive examinations.

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.
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.
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 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.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing
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.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter
GEO 5313. Environmental Management.
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

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. Advanced Regional Studies.
Course focus is the region. Case studies will be selected from political and functional regions. Course content will include such information as demographics, economy, physical and social environments, transportation, and foreign trade. May be repeated for credit with a different topic.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
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.
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.
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.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
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 will introduce students to ideas, concepts, and literature in historical geography of the environment. It will explore methods used to document past environments and examine environmental changes, and it will analyze the distinctions between historical geography and related fields of study.
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.
A course designed to allow the student to pursue a topic of applied geographic research under the direct supervision of a professor. Generally, the topic will be something that is not customarily dealt with in an organized class. Topics should be selected that involve library research and field investigation.
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. Seminar: Theory and Methods of Geographic Education.
A critical analysis of previous and current literature concerning problems in pedagogy, philosophy, teaching theory, research methods, teaching methodologies, and techniques of geographic education. A research paper will be required of each student on a topic related to the course content.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

GEO 5343. Technology in Geographic Education.
The course focuses on the applications and implications of technology in geographic education, particularly its role as an instructional tool to promote inquiry-based learning.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Grade Mode: Standard Letter

GEO 5344. Seminar in Geographic Curriculum.
A survey and discussion of major curricula in geographic education. Geography will be viewed as a school subject that is part of the social studies, as an element of interdisciplinary studies, and as a stand-alone subject.
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.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
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): 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 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.
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.
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.
Grade Mode: Standard Letter

GEO 5391. Foundation Studies in Geography.
Students develop knowledge and skills required for success in graduate-level coursework in Geography. Course content varies depending on academic preparation. This course does not earn graduate degree credit. Repeatable with different emphasis. Prerequisite: Instructor approval.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Leveling/Assistantships

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 5393C. 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 will provide in-depth experience with database query languages. Many DBMSs will be reviewed, but practical work will be completed with RDBMSs. Prerequisite: GEO 5418 with a grade of "C" or better.
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. 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 will 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.
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 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
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 three graduate tracks: physical-environmental, land area development and management, or cartography. Repeatable for up to six hours.
3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
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.  
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

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 5432. Consulting.  
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 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.  
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.  
Grade Mode: Credit/No Credit