

DEPARTMENT OF GEOGRAPHY

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Texas State Geography is one of the largest undergraduate programs in the United States. The Journal of Geography, the Association of American Geographers, and a National Program Effectiveness Survey recognized the Department as among the best undergraduate Geography programs in the nation. Additionally, the Department of Geography's internship program is the largest of its kind, placing students in both government agencies and private enterprises to provide students real-world experience to complement their academic program. The Department also offers highly acclaimed field experiences to places such as Big Bend National Park, the Southwestern United States, Europe and Mexico, where students gain invaluable firsthand geographical knowledge while gaining academic credit.

The undergraduate geography program offers a variety of majors of study. Students may select a Bachelor of Arts (B.A.) degree or a Bachelor of Science (B.S.) degree. The degrees provide students programs and courses designed to increase their understanding of the world they live in and to help students develop analytical skills necessary to interpret and solve real-world problems. The B.A. requires a minimum of 30 semester hours of Geography while the B.S. requires a minimum of 36 hours of Geography coursework. Geography majors may include a maximum of two additional Geography courses towards their major. Geography majors are required to complete a minor and are encouraged to select a minor in consultation with an academic advisor.

Major in Geography

The Geography major under the Bachelor of Arts or the Bachelor of Science degrees provides flexibility in designing unique programs for students with highly specialized career or graduate study objectives. Students electing to follow this major are strongly encouraged to work with a faculty member with experience in their special area of interest.

Major in Geography with Teacher Certification in Social Studies

This Bachelor of Science degree program is designed to prepare students to teach any of the four social studies disciplines (History, Geography, Government, and Economics) at the secondary level (grades 7-12). Upon completion of the social studies curriculum and passage of the social studies TExES test, students will receive certification in social studies and eligibility to teach in any of the four disciplines. Students pursuing secondary certification with a major in Geography select a minor from the disciplines of History or Political Science. In addition, students will complete specific courses in the third social studies discipline not chosen as a major or minor.

Major in Geographic Information Science

The general philosophy of the program stresses the importance of a content-rich background in geography along with principles and techniques of Geographic Information Science: GIS; remote sensing; visualization; cartography; spatial modeling; and quantitative methods. The Bachelor of Science major in Geographic Information Science was developed and structured for positions in local, state, and federal agencies, commercial companies, planning departments, engineering

firms, utility companies, and many others. To prepare for GIScience careers, many students perform internships with government agencies or private firms as part of their academic program.

Major in Geography Resource and Environmental Studies

The Bachelor of Science major in Geography Resource and Environmental Studies prepares students for a wide variety of government and private sector occupations relating to resource conservation and/or environmental management. Graduates pursue careers with employers such as the Texas General Land Office, the Texas Commission on Environmental Quality, the Texas Department of Transportation, Texas Parks and Wildlife, the National Geographic Society, the Lower Colorado River Authority, the San Antonio Water System, Motorola, Valero Energy and various private – sector environmental consulting firms.

Major in Geography Urban and Regional Planning

Planning is a diverse profession, which draws upon fields of knowledge and technical skills closely related to geography. The Bachelor of Science major in Urban and Regional Planning provides the means to evaluate and facilitate programs that benefit our neighborhoods, communities, cities, and regions. Population growth, economic development, transportation, education, public services, and the environment are a few of the essential factors evaluated by planners. Many of our graduates are employed as planners in Texas, as well as within other states and countries. Others have continued in graduate studies at Texas State or in other programs at the University of Texas or Texas A&M, as well as universities outside Texas.

Major in Geography Water Resources

The Bachelor of Science major in Geography Water Resources provides a focused study of the physical, chemical, social, political, and economic factors of water resources from the geographic perspective. As water resources become ever more critical to the nation, and in particular Texas and the Southwest Borderlands, this degree program addresses the increasing need for professionals in this crucial field. Graduates are highly sought after by government agencies, from local, state to federal, industries that have large water demands, agricultural interests and private consulting firms that specialize in water resource issues. The Lower Colorado River Authority, the Guadalupe-Blanco River Authority, the Edwards Aquifer Authority, and the San Antonio Water System all employ graduates of the program.

Major in Physical Geography

The Bachelor of Science major in Physical Geography emphasizes the physical science elements of geographical study. This major prepares students for employment in applied climatology and meteorology, oceanography, geomorphology, resource evaluation, environmental analysis, and areas where an understanding of the complex relationship between nature and society is required. Students considering graduate studies in Physical Geography or any of the earth and atmospheric sciences should select this degree option.

Admission Process

Students meeting university admission standards enter the undergraduate Geography program as pre-majors. To become majors,

students must complete the following with a grade of "C" or higher in each course:

Code	Title	Hours
GEO 1309 or GEO 1310	Introduction to Cultural Geography World Geography	3
GEO 2410	Introduction to Physical Geography	4
GEO 2426	Fundamentals of Geographic Information Systems	4
GEO 3301	Research Methods in Geography	3
Total Hours		14

Academic Advising

The Department of Geography provides extensive academic advising services which include individual and group advising. All geography majors and minors are encouraged to seek advice about program requirements and course selection each semester. Major faculty and academic advisors can offer detailed program and course information as well as course checklists for each major. Proper academic planning and academic advising leads students toward completing the steps for satisfying graduation requirements.

Bachelor of Arts (B.A.)

- Major in Geography (<http://mycatalog.txstate.edu/undergraduate/liberal-arts/geography/geography-ba>)

Bachelor of Science (B.S.)

- Major in Geographic Information Science (<http://mycatalog.txstate.edu/undergraduate/liberal-arts/geography/geographic-information-science-bs>)
- Major in Geography (<http://mycatalog.txstate.edu/undergraduate/liberal-arts/geography/geography-bs>)
- Major in Geography (Teacher Certification in Social Studies, Grades 7-12: History Minor and Political Science Third Field) (<http://mycatalog.txstate.edu/undergraduate/liberal-arts/geography/geography-teacher-certification-social-studies-grades-7-12-history-minor-political-science-third-field-bs>)
- Major in Geography (Teacher Certification in Social Studies, Grades 7-12: Political Science Minor and History Third Field) (<http://mycatalog.txstate.edu/undergraduate/liberal-arts/geography/geography-teacher-certification-social-studies-grades-7-12-political-science-minor-history-third-field-bs>)
- Major in Geography Resource and Environmental Studies (<http://mycatalog.txstate.edu/undergraduate/liberal-arts/geography/resource-environmental-studies-bs>)
- Major in Geography Urban and Regional Planning (<http://mycatalog.txstate.edu/undergraduate/liberal-arts/geography/urban-regional-planning-bs>)
- Major in Geography Water Resources (<http://mycatalog.txstate.edu/undergraduate/liberal-arts/geography/water-resources-bs>)
- Major in Physical Geography (<http://mycatalog.txstate.edu/undergraduate/liberal-arts/geography/physical-bs>)

Minors

- Geography (<http://mycatalog.txstate.edu/undergraduate/liberal-arts/geography/geography-minor>)
- Geology (<http://mycatalog.txstate.edu/undergraduate/liberal-arts/geography/geology-minor>)

- Nature and Heritage Tourism (<http://mycatalog.txstate.edu/undergraduate/liberal-arts/geography/nature-heritage-tourism-minor>)

Certificates

- Environmental Interpretation (<http://mycatalog.txstate.edu/undergraduate/liberal-arts/geography/environmental-interpretation-certificate>)
- Geographic Information Science (<http://mycatalog.txstate.edu/undergraduate/liberal-arts/geography/geographic-information-science-certificate>)
- Location Analysis (<http://mycatalog.txstate.edu/undergraduate/liberal-arts/geography/location-analysis-certificate>)
- Water Resources Policy (<http://mycatalog.txstate.edu/undergraduate/liberal-arts/geography/water-resources-policy-certificate>)

Subjects in this department include: GEO (p. 2), GEOL (p. 9), NHT (p. 10)

Courses in Geography (GEO)

GEO 1105. Meteorology Laboratory.

Laboratory observations, calculations, and exercises of meteorological data and phenomena. Prerequisite or corequisite: GEO 1305.

1 Credit Hour. 0 Lecture Contact Hours. 2 Lab Contact Hours.

Grade Mode: Standard Letter

TCCN: GEOL 1147

GEO 1305. Meteorology.

An introduction to atmospheric science providing information on the properties of the atmosphere, the scientific principles that govern weather and climate, and interactions between the atmosphere and the other components of the Earth system.

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

Course Attribute(s): Life & Phys Sciences Core 030

Grade Mode: Standard Letter

TCCN: GEOL 1347

GEO 1309. Introduction to Cultural Geography.

This course introduces students to the geographical perspective and focuses on spatial distributions of human activities and investigates underlying geographical processes that account for present and past cultural patterns such as population, folk and popular culture, language, religion, gender, ethnicity, politics, urban and rural land use, and economic development. (MULT).

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

Course Attribute(s): Multicultural Content

Grade Mode: Standard Letter

TCCN: GEOG 1302

GEO 1310. World Geography.

This course stresses the similarities and differences of the major world regions. Emphasis is given to human behavior in a spatial context. (MULT).

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

Course Attribute(s): Soc & Behav Sciences Core 080|Multicultural Content

Grade Mode: Standard Letter

TCCN: GEOG 1303

GEO 2110. Physical Geography Laboratory.

This is a laboratory course that includes exercises and calculations to apply principles and concepts covered in introductory physical geography lecture classes. These include geographic tools, weather and climate, soils and biogeography, and geomorphology. Open only to students who have taken the lecture class at another college/university. Prerequisites: MATH 1315 or MATH 1317 or MATH 1319 or MATH 1329 or MATH 2321 or MATH 2417, or MATH 2471 with a grade of "C" or better. An introductory physical geography lecture course with a grade of "C" or better. Instructor Approval Needed.

1 Credit Hour. 0 Lecture Contact Hours. 2 Lab Contact Hours.

Grade Mode: Standard Letter

GEO 2310. Introduction to Environmental Geography.

Introduces the Geographic perspective to examine the Earth's environment and its opportunities, constraints, and risks, Principles of scale space, and distributions will be used in examining the environment.

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

Grade Mode: Standard Letter

GEO 2410. Introduction to Physical Geography.

A systematic study of the various elements that make up the Earth's physical environment, weather, climate, vegetation, soil, and landforms. Prerequisite: MATH 1315 or MATH 1317 or MATH 1319 or MATH 1329 or MATH 2321 or MATH 2328 or MATH 2417 or MATH 2471, with a grade of "C" or better.

4 Credit Hours. 3 Lecture Contact Hours. 2 Lab Contact Hours.

Course Attribute(s): Lab Required

Grade Mode: Standard Letter

GEO 2420. Introduction to Geographic Information Techniques.

The course will introduce the foundations of geographic information systems (GIS), global positioning systems (GPS), remote sensing, cartography, data analysis, and other tools and methods used by geographic information scientists. Maps, data collection, using and creating Internet content, and data analysis and display will be topics in the course.

4 Credit Hours. 3 Lecture Contact Hours. 2 Lab Contact Hours.

Course Attribute(s): Lab Required

Grade Mode: Standard Letter

GEO 2426. Fundamentals of Geographic Information Systems.

This course is an introduction to Geographic Information Systems (GIS), a tool for integrating and analyzing spatial data to visualize relationships, seek explanations and develop solutions to pressing problems. The foundations and theory of GIS will be emphasized. Prerequisite: MATH 1315 or MATH 1317 or MATH 1319 or MATH 1329 or MATH 2321 or MATH 2328 or MATH 2417 or MATH 2471, 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 2427. Management and Implementation of GIS.

This course addresses strategies for successful GIS management and implementation in an organization-wide context and is organized around four primary issues: implementation planning, data management, technology assessment, and organizational setting. Prerequisite: GEO 2426 with a grade of "C" or better, or equivalent.

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

Course Attribute(s): Lab Required

Grade Mode: Standard Letter

GEO 3134. Water Quality Monitoring and Management.

This course incorporates the water quality training of Texas Watch so students can receive certification and become Texas Watch water quality monitors. In addition, students learn to compile, analyze, and present water quality data for watershed management. May be repeated once for credit. Corequisite or prerequisite: GEO 3434 with a grade of "C" or better.

1 Credit Hour. 0 Lecture Contact Hours. 3 Lab Contact Hours.

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

Grade Mode: Standard Letter

GEO 3301. Research Methods in Geography.

This course provides an introduction to quantitative and qualitative research methodology, data collection and analytical techniques. Topics include descriptive, inferential, spatial quantitative statistics and qualitative methods such as case studies and content analysis. The course will introduce students to software applications that are designed for organizing, analyzing and visualizing data. Prerequisite: MATH 1315 or MATH 1317 or MATH 1319 or MATH 1329 or MATH 2321 or MATH 2328 or MATH 2417 or MATH 2471, with a grade of "C" or better.

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

Grade Mode: Standard Letter

GEO 3303. Economic Geography.

This course investigates the geographic organization of economic activity with emphasis on the interconnections from global to local scales. Technological advances, resource creation and destruction, supply and demand, distribution and development, environmental impacts, and economic justice are addressed. Theoretical models are used to interpret past and current situations.

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

Grade Mode: Standard Letter

GEO 3305. Climatology.

Introduction to the elements of climate and their use in environmental monitoring and analysis. Prerequisite: GEO 1305 or GEO 2410 with a grade of "C" or higher.

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

Grade Mode: Standard Letter

GEO 3307. Geography of Europe.

The course presents a systematic and regional investigation of the physical and cultural processes and phenomena that have created the characteristic landscapes of Europe. Topics include the climate, landform regions, trade, transportation, urban growth, population change, and the evolution of economic integration in the region. (MULT).

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

Course Attribute(s): Multicultural Content

Grade Mode: Standard Letter

GEO 3308. Latin America.

A regional survey of the physical and cultural geography of Latin America. (MULT).

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

Course Attribute(s): Multicultural Content

Grade Mode: Standard Letter

GEO 3309. United States and Canada.

This course provides a systematic and regional analysis of the United States and Canada with emphasis on contemporary economic, environmental, political, and social issues. (MULT) (WI).

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

Course Attribute(s): Multicultural Content|Writing Intensive

Grade Mode: Standard Letter

GEO 3310. Urban Geography.

The study of city systems, form, and development with emphasis on functional patterns, economic base, industrial location, service, and social area analysis.

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

Grade Mode: Standard Letter

GEO 3313. Natural Resource Use and Management.

This course uses environmental concepts at all geographic scales to identify and analyze patterns and processes of resource use, and discusses management strategies to solve present and future concerns related to natural resources. Prerequisite: GEO 2410 with a grade of "C" or better.

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

Grade Mode: Standard Letter

GEO 3320. Community and Regional Planning.

This course examines the practice, history and development of community and regional planning in the U.S. focusing on specific methods and legal frameworks of community planning and cultivating sustainable development.

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

Course Attribute(s): Writing Intensive

Grade Mode: Standard Letter

GEO 3321. Energy Resource Management.

An analysis of energy sources, their distribution and characteristics, and the problems associated with their use and management. Prerequisite: MATH 1315 or MATH 1317 or MATH 1319 or MATH 1329 or MATH 2321 or MATH 2328 or MATH 2417 or MATH 2471, with a grade of "C" or better. (WI).

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

Course Attribute(s): Writing Intensive

Grade Mode: Standard Letter

GEO 3323. Location Analysis.

Location and movement stressed in terms of the factors considered in locating industry, business, housing, and community facilities.

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

Grade Mode: Standard Letter

GEO 3328. Geography of North Africa and the Middle East.

A regional treatment dealing with the physical features and cultural activities of the people in North Africa and the Middle East. (MULT).

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

Course Attribute(s): Multicultural Content

Grade Mode: Standard Letter

GEO 3329. Geography of Texas.

A physical and cultural geography of Texas with special emphasis on human resources and economic activities. (MULT).

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

Course Attribute(s): Multicultural Content

Grade Mode: Standard Letter

GEO 3332. Geography of South and Southeast Asia.

This course is a systematic and regional overview of the physical and human geography of the countries of the Indian subcontinent and Southeast Asia. Topics include the monsoons, cultural diversity, rapid economic development, agricultural systems, and environmental problems. (MULT) (WI).

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

Course Attribute(s): Multicultural Content|Writing Intensive

Grade Mode: Standard Letter

GEO 3333. Geography of China and Japan.

This course provides a regional overview of the physical and human geography of the countries of East Asia. This course also systematically examines China, Korea, and Japan by closely examining such topics as the impacts of high population densities and intensive land use practices. (MULT).

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

Course Attribute(s): Multicultural Content|Writing Intensive

Grade Mode: Standard Letter

GEO 3335. Oceanography.

An introductory course about the physical, chemical, geologic, and biologic characteristics of the oceans and coastal areas. Emphasis will be placed on the role of the oceans as a component of the global environment. Prerequisite: GEO 2410 or GEOL 1410 or BIO 1320 or BIO 1430, with a grade of "C" or better.

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

Grade Mode: Standard Letter

GEO 3340. Political Geography.

Political geography concerns the interrelationship between political activities and spatial distributions. Topics include the concept of the state, international spheres of influence and confrontation, boundaries, contemporary world issues and problems, and geographic aspects of electoral politics.

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

Grade Mode: Standard Letter

GEO 3349. Population Geography.

An in-depth study of the spatial distribution and movement of human populations. The 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. Prerequisite: MATH 1315, MATH 1317, MATH 1319, MATH 1329, MATH 2321, MATH 2328, MATH 2417, or MATH 2471 with a grade of "C" or better.

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

Grade Mode: Standard Letter

GEO 3351. Geography of Health.

This course introduces concepts of health, health care, disease, and illness from a geographical perspective. The course will examine how people and societies interact geographically with the environment in ways that result in varying degrees of health. The focus will be on understanding health from the perspective of populations rather than individuals in a geographic context.

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

Grade Mode: Standard Letter

GEO 3353. American Ethnic Geography.

A geographical analysis of ethnic groups in the United States with emphasis on their settlement patterns, spatial interactions, and current problems. (MULT).

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

Course Attribute(s): Multicultural Content|Writing Intensive

Grade Mode: Standard Letter

GEO 3411. Maps and Mapmaking.

An introduction to reference and thematic map use and design. The course introduces basic cartographic mapping techniques for quantitative and qualitative data, teaches about geospatial analysis and interpretation, and enables students to design basic maps. Prerequisite: GEO 2426 with a grade of "C" or better.

4 Credit Hours. 3 Lecture Contact Hours. 2 Lab Contact Hours.

Course Attribute(s): Lab Required

Grade Mode: Standard Letter

GEO 3416. Principles of Remote Sensing.

Introduction to the acquisition, mensuration, interpretation, and mapping of aerial photographs and satellite images for environmental monitoring and inventorying. Prerequisite: GEO 2410 with a grade of "C" or better.

4 Credit Hours. 3 Lecture Contact Hours. 2 Lab Contact Hours.

Course Attribute(s): Lab Required

Grade Mode: Standard Letter

GEO 3425. Geomorphology.

This course in Geomorphology investigates linkages between landscape forms and processes with emphasis on weathering, fluvial, aeolian, karst, and coastal processes. There will be various activities, including fieldwork, where students will demonstrate their grasp on fundamental processes in geomorphology. Prerequisite: GEO 2410 or GEOL 1410 with a grade of "C" or better.

4 Credit Hours. 3 Lecture Contact Hours. 2 Lab Contact Hours.

Grade Mode: Standard Letter

GEO 3426. Advanced GIS.

This course builds on the principles introduced in GEO 2426 and presents an in-depth examination of the technical aspects involved in spatial data handling, analysis, and modeling. Prerequisite: GEO 2426 and GEO 3301, all 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 3434. Water Resources.

This course analyzes within a geographical perspective, the formation, use, conservation, and management of water resources. The students will develop a working knowledge of the hydrologic, water quality, legal, economic, political, and societal factors that determine water availability, hazards, use, demand, and allocation. Prerequisite: GEO 2410, or CHEM 1141 and CHEM 1341, with a grade of "C" or better.

4 Credit Hours. 3 Lecture Contact Hours. 2 Lab Contact Hours.

Course Attribute(s): Lab Required

Grade Mode: Standard Letter

GEO 4190. Independent Study.

Individual study under direct supervision of a professor. May involve field trips. This course may be repeated for credit, but a student may not exceed six hours of credit in Independent Study.

1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.

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

Grade Mode: Standard Letter

GEO 4290. Independent Study.

Individual study under direct supervision of a professor. May involve field trips. This course may be repeated for credit, but a student may not exceed six hours of credit in Independent Study.

2 Credit Hours. 2 Lecture Contact Hours. 0 Lab Contact Hours.

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

Grade Mode: Standard Letter

GEO 4306. Geography of the Southwest.

Though primarily defined by aridity, the southwestern United States is extremely diverse in its environments and its people. This course explores how people have related to this land. This course also examines current issues and future trends in natural resources and cultural processes in the region. (MULT).

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

Course Attribute(s): Multicultural Content

Grade Mode: Standard Letter

GEO 4309. Cultural and Political Ecology.

This course examines cultural and political ecology, which employs concepts of culture formation/change and biological ecology to understand processes of adaptation and the influences of social/political power. It provides a holistic means to interpret pre-modern, non-western, and agrarian cultures as well as modern cultures as relates to their biophysical environment.

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

Course Attribute(s): Writing Intensive

Grade Mode: Standard Letter

GEO 4310. Regional Field Studies.

Observation, description, and analysis of a geographical environment based upon offcampus study in that environment. May be repeated once, provided the second study is in a different region, for a total of 6 semester hours. (WI).

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

Course Attribute(s): Exclude from 3-peat Processing|Writing Intensive

Grade Mode: Standard Letter

GEO 4313. Environmental Management.

This course provides an analysis of the causes of environmental problems, from local to global scale, and the evaluation of attempts at management and solutions of those problems. Emphasis will be placed on the role that geography can play in environmental degradation and management. Prerequisite: GEO 2410 with a grade of "C" or better and senior status. (WI).

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

Course Attribute(s): Writing Intensive

Grade Mode: Standard Letter

GEO 4314. River Basin Management.

The purpose of this course is to study principles and practices of large-scale river basin management. Emphasis is on integrated management of land and water resources, including economic development and environmental protection issues. Prerequisite: GEO 3434 or GEO 4325 with a grade of "C" or better. (WI).

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

Course Attribute(s): Writing Intensive

Grade Mode: Standard Letter

GEO 4316. Landscape Biogeography.

Investigation of present-day and post-Pleistocene spatial patterns of plants, animals, and biogeographical processes. Human interactions with biogeographical patterns is also addressed, as are methods for reconstructing Holocene patterns of biogeographic distribution. Course to be taught over every other year. Prerequisite: GEO 2410 with a grade of "C" or better.

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

Grade Mode: Standard Letter

GEO 4321. Cities and Urban Design.

This course explores the interplay of intentional and natural processes shaping urban landscapes. It provides an introduction to the roles of spatial thinking and collaborative decision-making in urban planning and design. Prerequisite: GEO 3310 with a "C" or better and junior or senior status.

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

Grade Mode: Standard Letter

GEO 4322. Interpretive Environmental Geography.

Students learn principles, themes, and techniques for effective interpretation of environmental information to audiences ranging from park visitors to professional conferences. Interpretive themes are drawn from geographic concepts including the physical and cultural landscapes and cultural ecology. Techniques emphasize effective use of traditional and digital presentation methods. Prerequisite: GEO 2410 with a grade of "C" or better. (WI).

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

Course Attribute(s): Writing Intensive

Grade Mode: Standard Letter

GEO 4323. Conservation Leadership.

This course offers an in-depth introduction to the conservation movement and the philosophy, establishment, and operation of institutions engaged in that movement. Problems and attributes of leadership will be emphasized along with the operational implications, ethical issues and other considerations for successful implementation at non-governmental, local, state, and federal levels. Restricted to Junior or Senior Standing.

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

Grade Mode: Standard Letter

GEO 4325. Fluvial Processes.

Students analyze modern principles of river processes and forms within a geographical perspective. This course examines the fundamental mechanics of fluvial channels with an emphasis on quantitative geographic evaluation of their processes. The course emphasizes natural scientific perspectives and includes linkages to ecology, engineering, resources management, and policy. Prerequisite: GEO 3325 or GEO 3434 with a grade of "C" or better.

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

Grade Mode: Standard Letter

GEO 4326. 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. Prerequisite: Junior or Senior status.

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

Grade Mode: Standard Letter

GEO 4328. Geography of the Russian Realm.

This course presents a regional and systematic overview of the physical and human geography of the countries of the former Soviet Union. The course examines in depth issues such as the legacy of the degraded landscape and environmental problems left by decades of Soviet industrialization. (MULT) (WI).

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

Course Attribute(s): Multicultural Content|Writing Intensive

Grade Mode: Standard Letter

GEO 4334. Groundwater Resources.

This course examines, within a geographical perspective, the major concepts and principles that control groundwater availability and use. Students will analyze aquifer characteristics that determine their water quantity and quality. Constraints on aquifer use including environmental, economic, societal, and legal factors will be analyzed for optimizing aquifer management and water-use policy. Prerequisite: GEO 3434 with a grade of "C" or better.

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

Grade Mode: Standard Letter

GEO 4335. Directed Research.

Individual and group research projects at the advanced level that are not offered in the present curriculum. Permission and project approval must be obtained from the faculty member prior to registration. This course may be repeated for credit, but a student may not exceed six hours of credit in Directed Research.

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

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

Grade Mode: Standard Letter

GEO 4336. Transportation Systems.

This course is an examination of the evolution of urban transportation systems, policies, institutions, and methods in the United States. Principles, procedures, and techniques of transportation planning in the State of Texas are covered and students are introduced to the literature in transportation geography and methods of transportation analysis.

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

Grade Mode: Standard Letter

GEO 4338. Planning Practicum.

This capstone course focuses on methods and procedures used for planning and managing urban development on the local level. Topics include municipal ordinances, the development/redevelopment process and relationships between development, capital improvements and the local economy. Prerequisite: GEO 3320 with a "C" or better and junior or senior status.

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

Grade Mode: Standard Letter

GEO 4339. Environmental Hazards.

Analysis of environmental hazards with respect to human use of the land. Includes geologic hazards and problems caused by floods and meteorological conditions. Prerequisite: GEO 2410 with a grade of "C" or higher.

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

Grade Mode: Standard Letter

GEO 4340. Fundamental Themes in Geography.

Students will become familiar with the K-12 Geography Texas Essential Knowledge and Skills (TEKS) and the national geography content standards, identify instructional resources and materials, design instructional units, and fully develop grade level appropriate inquiry based lessons and student assessments. (WI).

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

Course Attribute(s): Writing Intensive

Grade Mode: Standard Letter

GEO 4341. Water Policy.

This course covers the evolution of water policy from the awareness of issues, through the political and legal process, to the implementation of specific plans, programs, and facilities. Prerequisite: GEO 3434 with a grade of "C" or better.

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

Grade Mode: Standard Letter

GEO 4350. Solid Waste Planning and Management.

A survey of the methods of solid waste disposal including waste storage, collection, transportation and disposal, and their short-and long-range effects on the environment. A practical course in the planning, implementation, and management of alternate methods of sanitary waste disposal. Prerequisite: GEO 2410 with a grade of "C" or higher.

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

Grade Mode: Standard Letter

GEO 4352. Air Quality Management.

This course provides an assessment and analysis of air quality including types, sources, and effects of air pollutants as well as principles governing their dispersal and management. These aspects are analyzed considering physical science, economic, legal and social factors.

Prerequisite: CHEM 1141 and CHEM 1341, or GEO 2410, or GEO 3305 with a grade of "C" or better.

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

Grade Mode: Standard Letter

GEO 4355. Geography of Crime.

This course provides understanding of geographical aspects of crime and criminal behavior. Students are exposed to theories and analysis methods and models explaining and predicting crime spatial patterns. Computer exercises give students hands on experience on crime pattern analysis.

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

Grade Mode: Standard Letter

GEO 4380. Internship in Geography.

On-the-job training in a public or private-sector agency. Students must apply to the department internship director at least six weeks prior to registering for the internship course. This course may be repeated one time for additional internship 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 4390. Independent Study.

Individual study under direct supervision of a professor. May involve field trips. This course may be repeated for credit, but a student may not exceed six hours of credit in Independent Study.

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

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

Grade Mode: Standard Letter

GEO 4393A. Environmental Compliance.

This course examines the implementation and enforcement of environmental statutes and regulations from a geographic perspective that includes physical environmental, cultural, social, economic, and legal parameters. The course focuses on current environmental requirements as applied to contemporary regulatory challenges including widely applicable innovative compliance strategies. Prerequisite: One course from GEO 3321 or GEO 3434 or GEO 4350, or GEO 4352, all 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|Topics

Grade Mode: Standard Letter

GEO 4393B. Business Geography.

This course provides an exploration of the geospatial analysis of business activities in the United States with emphasis on site location, market segmentation and material/product tracking.

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 4393C. Introduction to GeoProgramming.

This course aims to develop advanced GIS concepts, techniques, analytical skills (e.g. spatial data manipulation), and provide hands-on experience with geoprogramming in GIS software programs. The emphasis will focus on the application of basic programming skills to solve real-world GIS problems. Prerequisite: GEO 3426 with a grade of "C" or higher.

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 4393D. Geography of Food and Agriculture.

Critical evaluation of local and global food systems considering the implications of varying forms of production and consumption. Exploration of topics related to sociocultural, economic, and environmental landscape change as well as the role of agriculture in both rural and urban places, and sustainability writ large.

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

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

Grade Mode: Standard Letter

GEO 4393E. Race, Class, and the American City.

This course examines historical and contemporary intersections of race and class as they have been shaped by and continue to influence urbanization in the United States while emphasizing geographical understandings of space and place. Topics include segregation, immigration, civil rights, housing, crime, race and the environment, community development, and cultural.

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 4393F. Geographies of the Holocaust and Genocide.

This course examines the Holocaust as a complex historical event and frames the Holocaust in the context of, and in comparison to, other genocides. The course is explicitly geographical in methods and subject matter, focusing on how the Holocaust and genocide are planned, implemented, and experienced differently in different places.

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 4411. Advanced Cartographic Design.

This advanced course in cartography focuses on thematic map design. The objective is to produce a cartographic portfolio of well-designed, professional grade maps. Theoretical concepts and principles will be introduced using practical examples and written assignments. 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 4412. Digital Remote Sensing.

Introduction to the digital image processing of satellite scenes including restoration, enhancement, classification, change detection, and mapping for environmental monitoring and inventorying. Prerequisites: GEO 3301 and GEO 3416, all with a grade of "C" or better. (WI).

4 Credit Hours. 3 Lecture Contact Hours. 2 Lab Contact Hours.

Course Attribute(s): Lab Required|Writing Intensive

Grade Mode: Standard Letter

GEO 4417. Digital Terrain Modeling.

The course focuses on the mapping, transformation, mensuration, visualization, and applications of digital elevation models in Geography. Prerequisite: GEO 2426 and GEO 3416 with a grade of "C" or better.

4 Credit Hours. 3 Lecture Contact Hours. 2 Lab Contact Hours.

Course Attribute(s): Lab Required

Grade Mode: Standard Letter

GEO 4422. Web Mapping.

The 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 or equivalent 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 4424. 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 client(s). Prerequisites: GEO 2426 and GEO 3411 or GEO 3426, all with a grade of "C" or better.

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

Grade Mode: Standard Letter

GEO 4427. GIS Design and Implementation.

This course involves students working as a team on a substantive GIS project, which is designed and conducted by the class. Students will develop and demonstrate competence in GIS techniques at the professional level. Prerequisite: GEO 3426 or equivalent with a grade of "C" or better, Junior or Senior standing, and instructor approval.

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

Course Attribute(s): Lab Required

Grade Mode: Standard Letter

GEO 4430. Field Methods.

Methods and techniques for observing, measuring, recording, and reporting on geographic phenomena are investigated in this course. Students will learn the use of instruments and materials in the collection of data for mapping and field research in the local area. Prerequisites: GEO 2410 and GEO 3301 or equivalents with a grade of "C" or better. (WI).

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

Course Attribute(s): Lab Required|Writing Intensive

Grade Mode: Standard Letter

Courses in Geology (GEOL)

GEOL 1410. Physical Geology.

The study of materials making up the Earth, the processes that act upon them, and the results of these processes; the development of tools for the interpretation of earth's history and structure, and the major geologic concepts.

4 Credit Hours. 3 Lecture Contact Hours. 2 Lab Contact Hours.
Course Attribute(s): Life & Phys Sciences Core 030|Lab Required
Grade Mode: Standard Letter
TCCN: GEOL 1403

GEOL 1420. Historical Geology.

A continuation of physical geology leading to consideration of the geologic history of the Earth (with special emphasis on North America), the evolution of life, the continents through geologic time and the principles and procedures used in the interpretation of earth history. Prerequisite: GEOL 1410 with a grade of "C" or better.

4 Credit Hours. 3 Lecture Contact Hours. 2 Lab Contact Hours.
Course Attribute(s): Life & Phys Sciences Core 030|Lab Required
Grade Mode: Standard Letter
TCCN: GEOL 1404

GEOL 3410. Sedimentation and Stratigraphy.

This course will allow students to study the principles of weathering, transportation, deposition, and lithification of sediments. Primary structures and textures of sediments are used to determine environments of deposition. Students will identify the recognition and classification of strata into stratigraphic units. Prerequisite: GEOL 3450.

4 Credit Hours. 3 Lecture Contact Hours. 3 Lab Contact Hours.
Course Attribute(s): Lab Required
Grade Mode: Standard Letter

GEOL 3430. Structural Geology.

This course examines the description, classification, and origin of Earth structures and the stresses involved in their formation. Students will explore solutions of structural geology problems using analytical geometry, geologic maps, contouring of data, and preparation of cross sections. Prerequisites: GEOL 1410, GEOL 1420; MATH 1317, MATH 2321, or MATH 2417; all with a grade of "C" or better.

4 Credit Hours. 3 Lecture Contact Hours. 3 Lab Contact Hours.
Course Attribute(s): Lab Required
Grade Mode: Standard Letter

GEOL 3440. Paleontology and Biostratigraphy.

Identification of ancient invertebrate faunas and their applications in reconstruction of paleoenvironments, paleogeography, and the means by which "time" correlations can be effected in sedimentary strata. Field intensive course, 1 full day in the field per week. Course will be offered alternating summers. Prerequisites: GEOL 1410 and GEOL 1420 or equivalents, all with a grade of "C" or better.

4 Credit Hours. 3 Lecture Contact Hours. 3 Lab Contact Hours.
Course Attribute(s): Lab Required
Grade Mode: Standard Letter

GEOL 3450. Earth Materials.

This course provides an introduction to crystal chemistry, physical properties, and identification of major rock-forming minerals, sedimentary, igneous, and metamorphic rocks. It brings together wide-ranging fundamental and key concepts in mineralogy and petrology to understand rocks and minerals and how they relate to the broader Earth, materials and environmental sciences. Prerequisite: GEOL 1410; GEOL 1420; and MATH 1317 or MATH 2321 or MATH 2471 with grades of "C" or better.

4 Credit Hours. 3 Lecture Contact Hours. 3 Lab Contact Hours.
Grade Mode: Standard Letter

GEOL 4121. Directed Study.

Independent study of a particular subject area in geology. Specific topic to be discussed and agreed upon prior to registration. May be repeated once with different emphasis and professor for additional credit. Prerequisite: GEOL 1410 and GEOL 1420, all with a grade of "C" or better and approval of the instructor.

1 Credit Hour. 1 Lecture Contact Hour. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing
Grade Mode: Standard Letter

GEOL 4320. Topics in Field Geology.

This course provides on-site directed investigations of geology in locations remote from campus. Prerequisite: GEOL 1410 and GEOL 1420, all with a grade of "C" or better.

3 Credit Hours. 1 Lecture Contact Hour. 6 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Writing Intensive
Grade Mode: Standard Letter

GEOL 4321. Directed Study.

This course is designed to provide a student with an opportunity to conduct independent research for credit in consultation with his or her Geology instructors. The course may be repeated once with a different content or instructor. Prerequisite: GEOL 1410 and GEOL 1420, all 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

GEOL 4330A. Introduction to Petroleum Geology.

This course discusses the origin and distribution of conventional and unconventional petroleum resources, source rocks, types of traps and seals, reservoir rock properties, exploration methods (seismic data analysis and interpretation, formation evaluation, subsurface mapping), reservoir characterization and modeling, reserves calculations. Prerequisite: GEOL 1410 and GEOL 1420, all with a grade of "C" or better. Corequisite: GEOL 4121.

3 Credit Hours. 3 Lecture Contact Hours. 0 Lab Contact Hours.
Course Attribute(s): Exclude from 3-peat Processing|Topics
Grade Mode: Standard Letter

GEOL 4330B. Planetary Geology.

This course is a survey of the application of geologic principles to the rocky planets and satellites in the solar system. Prerequisites: GEOL 1410 and GEOL 1420, all 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|Topics
Grade Mode: Standard Letter

GEOL 4330C. Survey of Economic Mineral Deposits.

This is a survey of the geology of economic resource derived from the Earth including metals, nonmetals, energy related resources and ground water. Topics include genesis of economic deposits, methods of prospecting, methods of extraction, refining, and environmental impact. Prerequisite: GEOL 3450 with a minimum grade of "C" or better.

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

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

Grade Mode: Standard Letter

GEOL 4330D. Tectonics and Geology of the USA.

Study of the geology of the USA from the tectonic point of view. The different tectonic processes including continental extension and formation of an ocean, convergence and mountain building, volcanism and seismic activity will be studied and illustrated using mostly examples based on the geology of the USA. Prerequisite: GEOL 1410 and GEOL 1420 with a grade of "C" or higher.

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

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

Grade Mode: Standard Letter

GEOL 4421. Hydrogeology.

This course will provide the student with an introduction to the science of hydrogeology, a conceptual and quantitative understanding of groundwater from a geological/mathematical/geochemical perspective, and experience with hydrogeology applications. Prerequisites: GEOL 1420 with a grade of "C" or better, and MATH 1317, or MATH 2321, or MATH 2417.

4 Credit Hours. 3 Lecture Contact Hours. 3 Lab Contact Hours.

Course Attribute(s): Lab Required|Writing Intensive

Grade Mode: Standard Letter

Courses in Nature and Heritage and Tourism (NHT)

NHT 4301. Planning and Development of Nature and Heritage Tourism.

This course applies basic planning and development principles to the special issues of nature and heritage tourism. Particular emphasis is placed on locational analysis, site analysis, and planning for sustainable use. Prerequisite: GEO 2410 with a grade of "C" or better, or permission of the instructor.

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

Grade Mode: Standard Letter

NHT 4302. Internship in Nature and Heritage Tourism.

Students will work in private or public sector settings to gain practical experience in the planning, development and management of nature and/or heritage tourism. Internships must be approved by the director of the Center for Nature and Heritage Tourism. Students will be expected to perform at high professional standards and will interpret the internship experience within the context of current literature. Prerequisite: NHT 4301 with a grade of "C" or better.

3 Credit Hours. 0 Lecture Contact Hours. 10 Lab Contact Hours.

Grade Mode: Standard Letter