

GE - GEOGRAPHY (GE)

***Course Fees are Per Credit Hour**

GE 502. Geopolitics. (3 Credits)

Geopolitics examines the intersection of geography, international relations, and politics and explores the geographic factors that explain foreign relations, state behavior, and transnational and global issues such as military conflict, terrorism, international crime, food and water security, energy security, and environmental degradation. Students are trained in negotiation and policy-making skills and participate in a multi-day simulation exercise. (Fall, even-numbered years).

Course Fees: \$60

GE 503. Nature and Society Interactions. (3 Credits)

This course involves a global analysis of human-environment issues including human's impact on the environment and the environment's impact on humans. Topics addressed may include, but are not limited to global warming, overpopulation, environmental degradation, environmental hazards and disasters, and effective natural resource use. One field trip required. (Spring)

Course Fees: \$60

GE 504. Environmental Hazards. (3 Credits)

Natural and technological events continue to impact people and places across the globe. This course draws upon hazard and disaster experiences to address the nature, impact, and social responses to environmental hazards. Course focus is on the relationship between nature, society, and technology and analyzes how people and places experience, cope with, and recover from environmental hazards. (Fall)

Course Fees: \$60

GE 510. Integration of Geography and History. (3 Credits)

The integration of the spatial concepts of geography with the chronological concepts of history. Also listed as HI 510 but creditable only in the field for which registered. (Offered on sufficient demand)

Course Fees: \$60

GE 515. Quantitative Methods in Geography. (3 Credits)

Course provides an introduction to quantitative methods used by geographers to analyze and interpret geographic data and solve geographic problems. Topics include descriptive statistics, hypothesis formulation and testing, sampling strategies, correlation, regression, and spatial pattern analysis. Examples will be drawn from temporal and spatial relationships in physical and human geography. (Fall)

Course Fees: \$60

GE 520. Principles of Urban and Regional Planning. (3 Credits)

This course introduces planning both as a profession and also as an important element of city, county, and regional government. Focusing on American planning experience, GE 520 covers the fundamentals of spatial decision-making at various levels of government. Substantive areas covered in the course include: the legal basis of planning, organizational structure of planning agencies in the US, comprehensive planning, social issues in planning, tools of land use regulation, growth management techniques, smart growth, transportation planning, environmental planning and urban design. (Fall)

Course Fees: \$60

GE 530. Biogeography. (3 Credits)

Science of documenting and understanding spatial patterns of biological diversity. This course will introduce students to concepts used in understanding historical, ecological, and geological processes that contribute to past and present biological distributions including the historical development of biogeographic concepts, plate tectonics, evolution, phylogeography, the fossil record, niche theory, and patterns of disjunction. Applications of biogeography to contemporary issues will also be discussed including global climate change, conservation, invasive species, and human population growth. A field trip is required. Prerequisites: GE 112 or BI 112. (Offered upon sufficient demand)

Course Fees: \$60

GE 535. Regional Geomorphology. (3 Credits)

Field-based exploration of landforms and features. Focus is on the examination and understanding of various landforms and the processes that shape these features. Course requires travel. By permission of Instructor. Other travel expenses required. (Offered upon sufficient demand).

Course Fees: \$60

GE 550. Fundamentals of Sustainability. (3 Credits)

This course provides the foundational principles undergirding the concept of sustainability from a geographical perspective. Course activities involve tracing the history and development of sustainability and the role of the environment, economy and social issues in sustainability. Participants are exposed to a variety of applications of sustainability at the local, national and international levels, preparing them to be advocates for wise use of resources. (Fall)

Course Fees: \$60

GE 554. Remote Sensing. (4 Credits)

This course is designed to introduce advanced concepts, applications, and technologies of Remote Sensing. Instruction includes major remote sensing systems, applications, advanced digital image processing techniques. Prerequisites: GE 354 or departmental approval. (Spring)

Course Fees: \$60

GE 560. Advanced Cultural Geography. (3 Credits)

A conceptual approach to the study of human environment systems, cultural landscape, ecological perspectives, environmental perception and behavior, and environmental stress. Prerequisite: GE 102 or departmental approval. (Offered on sufficient demand)

Course Fees: \$60

GE 564. GIS Programming. (3 Credits)

Geographic Information systems (GIS) are powerful computational tools for solving spatial problems. GIS programming serves the purpose of customizing GIS applications and streamlining spatial analysis by assembling functions provided by the underlying GIS platforms. This course introduces students to Model Builder and Geoprocessing script programming with Python in ArcGIS. Topics included GIS programming environment, programming syntax and styles, interface customization and a variety of GIS routines and functions that can be assembled through programming. (Fall)

Course Fees: \$60

GE 568. Geography of Beer, Wine, and Spirits. (3 Credits)

Course examines geographic factors that account for the historical development and regional variation of beer, wine, and spirits. Students are introduced to the practices of viticulture, hop and grain cultivation, enology, brewing, and distilling. The major cultural, economic, political, and environmental aspects of beer, wine, and spirits in major world regions are analyzed. No class activities will involve alcohol consumptions and/or tasting. (Spring, odd-numbered years).
Course Fees: \$60

GE 572. Historical Geography of the United States. (3 Credits)

The role of geographic conditions in the exploration, settlement, and development of the United States. Also listed as HI 572 but creditable only in the field for which registered. (Offered on sufficient demand)
Course Fees: \$60

GE 574. Web GIS. (3 Credits)

Combining the power of the internet and GIS has increased applications of GIS in e-business, e-government, e-science, and daily life. GE 574 introduces graduate students to the basic knowledge of, and advances in, Internet/Web GIS. The course focuses on the principles, methods, applications, and state-of-the-art Web GIS techniques and platforms. Using a hands-on approach, graduate students perform GIS data operations, query maps, analyze spatial data via the internet, and ultimately develop Web GIS apps for diverse audiences. For course objectives and learning outcomes, please see syllabus. Prerequisite: GE 384 or departmental approval. (Spring)
Course Fees: \$60

GE 584. Advanced GIS. (4 Credits)

This course focuses on advanced topics in geographic information science (GIS) including: surface analysis, location analysis, network analysis, geo-computation methods & modeling, and big data analytics. Through a series of hands-on self-paced GIS lab exercises, graduate students are introduced to 64-bit ESRI Desktop GIS Platform - ArcGIS Pro. The ultimate goal is to equip graduate students with industry-level advanced analytical and practical skills in GIS and spatial analysis. Prerequisites: GE 384 or departmental approval. (Spring)
Course Fees: \$60

GE 585. GIS Applications. (3 Credits)

This course builds on the core concepts and techniques covered in the course Geographic Information Systems (GIS) to provide an advanced skillset in a number of application areas of GIS. Using a hands-on approach, graduate students use specialized GIS software to complete projects which focus on GIS applications in business, marketing, local government, urban planning and community development, environmental management, resource planning, hazards, federal government, logistics, and other fields. Topical area(s) are determined by the instructor of record. Prerequisite: GE 384 or or department approval. (Fall)
Course Fees: \$60

GE 595. Geography Internship. (1-3 Credits)

Open to graduate students in the Department of Geography. A work-related experience with a public or private organization in which the graduate student gains experience in the professional geography field. International students must receive approval from the Office of International Affairs prior to course registration. (Fall, Spring, Summer)
Course Fees: \$60

GE 597. Special Topics. (1-4 Credits)

A study of one or more selected topics in applied or theoretical geography. Topics vary according to the needs of the students and the current professional environment. Maybe repeated for credit if the topic is different. (Fall, Spring, Summer)
Course Fees: \$60

GE 599. Independent Study-Practicum. (3 Credits)

Open to graduate students on approval of the department chair. Provides for independent study and research under departmental determination, supervision, and evaluation. (Fall, Spring, Summer)
Course Fees: \$60

GE 600. Geographic Thought. (3 Credits)

A study of the history and development of geographic thought, the evolution of the discipline of geography, and contemporary geographic philosophies, paradigms, and debates. (Fall)
Course Fees: \$60

GE 601. Physical Geography for Teachers. (3 Credits)

Considers the spatial aspects of climate, vegetation, soils, and landforms with special emphasis given to map use and map interpretation skills. (Offered on sufficient demand)
Course Fees: \$60

GE 602. Cultural Geography for Teachers. (3 Credits)

Considers the spatial aspects of human culture including location, population, migration, economics, politics, and global interdependence with special emphasis on map and atlas interpretation skills. (Offered on sufficient demand)
Course Fees: \$60

GE 603. Regional Geography for Teachers. (3 Credits)

An examination of the spatial distribution of physical and cultural attributes which give uniqueness and diversity to world regional patterns on the earth's surface. (Offered on sufficient demand)
Course Fees: \$60

GE 604. Methods and Materials of Geographic Education. (3 Credits)

The examination and application of instructional procedures and materials focusing upon current geographic objectives, concepts, and methods of learning appropriate to the needs of teachers of geography. (Offered on sufficient demand)
Course Fees: \$60

GE 605. Field Experience in Geography. (3 Credits)

A field-oriented approach to the study of environmental concepts, including man-earth relationships. Designed to be offered as a Saturday course during the regular school year or as a short summer course to allow for an adequate block of time to engage in field work. (Offered on sufficient demand)
Course Fees: \$60

GE 609. Geographic Methods in Design. (3 Credits)

A study of the history and development of geographic thought, the evolution of the discipline of geography, and contemporary geographic philosophies, paradigms, and debates. (Spring)
Course Fees: \$60

GE 610. Seminar in Geospatial Science. (3 Credits)

Geospatial science delves into determining the correct data and technology to address today's issues related to humans and their environment. An understanding of geospatial science provides a distinct perspective on the world, a unique lens through which to examine and interpret events, patterns, and processes that operate on or near the surface of Earth. The Seminar in Geospatial Science builds upon students' progression through a series of techniques courses in Geographic Information Science, remote sensing, and applications in urban, environment, and nature and society interaction. (Offered on sufficient demand)

Course Fees: \$60

GE 615. Advanced Quantitative Methods in Geography. (3 Credits)

Application of advanced statistical procedures including multivariate techniques for analysis of point and areal patterns and spatial data. Prerequisite: Undergraduate-level statistics.(Spring)

Course Fees: \$60

GE 620. Planning Theory and Process. (3 Credits)

This course is designed to provide an overview of the development of planning theory as it applies to the field of Urban and Regional Planning in the United States. The course will critically evaluate trends in planning theory with a focus on the evolution of main ideas and people who have influenced the field of planning in the US. To accomplish this goal, emphasis will be placed on normative, conceptual, methodological issues and various roles planners play, and also the ethical dilemmas they face in practice. (Offered on sufficient demand)

Course Fees: \$60

GE 624. Applied Remote Sensing. (3 Credits)

This course provides students with advanced topics in remote sensing and image processing including, change detection, image fusion, principle components analysis, spectral signatures, fuzzy classification, and pattern recognition. This course includes classroom instruction, videos, laboratory exercises, fieldwork, and state-of-the-art digital image processing techniques, all to support the interpretation of satellite imagery for extraction of land use and land cover information. One field trip is required. Prerequisite: graduate level image processing course. (Offered upon sufficient demand)

Course Fees: \$60

GE 625. Cartographic Design and Visualization. (3 Credits)

This course is concerned with advanced map communication concepts; cartographic visualization; designing graphic solutions to geographic situations and needs; illustrating spatial patterns; and considering cartographic representations in terms of aesthetics. Prerequisite: Cartography or equivalent undergraduate cartography class. (Offered upon sufficient demand)

Course Fees: \$60

GE 654. Advanced Remote Sensing. (3 Credits)

This course is designed to introduce advanced concepts, applications and technologies of Remote Sensing. Instruction includes major remote sensing systems, applications, advanced digital image processing techniques. Prerequisite: GE 554. (Spring)

Course Fees: \$60

GE 664. GIS Programming. (3 Credits)

Geographic Information Systems (GIS) are powerful computational tools for solving spatial problems. GIS programming serves the purpose of customizing GIS applications and streamlining spatial analysis by assembling functions provided by the underlying GIS platforms. This course introduces students to Model Builder and Geoprocessing script programming with Python in ArcGIS. Topics include GIS programming environment, programming syntax and styles, interface customization and a variety of GIS routines and functions that can be assembled through programming. Students are recommended to take some Python programming course before taking this course. Prerequisite: GE 584 or equivalent undergraduate GIS course . (Fall)

Course Fees: \$60

GE 674. Web GIS. (3 Credits)

With the internet becoming the main information source and communication platform for many people, the demand for accessing geographic information via internet is increasing rapidly. Web GIS, as the combination of the internet (Web) and GIS (Geographic Information Systems), is a new and promising field. It has unlocked the power of GIS and put online maps and geospatial intelligence to billions of people. Web GIS has immense applicability to e-business, e-government, e-science, and daily life. This course provides students with an understanding of the current state-of-the-art of Web GIS and an opportunity of developing practical Web GIS skills. Prerequisite: GE 584 or equivalent undergraduate course. (Spring)

Course Fees: \$60

GE 684. Spatial Modeling and Analysis in Geographic Information Science. (3 Credits)

This course focuses on advanced problem solving in the spatial environment including GIS system planning, and design, error handling and quality control, decision support techniques, exploratory data analysis, and spatial statistics and geostatistical analysis. Course labs and projects will focus on current issues, events and opportunities in GIScience. Prerequisite: GE 554 and GE 584. (Offered upon sufficient demand)

Course Fees: \$60

GE 685. GIS Applications - Business Analytics. (3 Credits)

This course focuses on the use of ArcGIS Business Analyst as a lens through which to visualize and solve common challenges in business. It takes a problem-based learning applied to spatially explicit problems. Learning these skills will prepare participants to: 1. Establish justifiable recommendations on where to locate, remodel, expand, or consolidate a business. 2. Develop customer profiles and market analysis from a spatial perspective to help determine the best areas to find new customers and enhance marketing strategies. 3. Apply the core skills of GIS to their own goals relevant to the establishment and operation of a business. Prerequisite: GE 584 or equivalent undergraduate GIS course. (Fall)

Course Fees: \$60

GE 686. Remote Sensing Applications - Remote Sensing for Hazards Analysis. (3 Credits)

This course is designed to introduce advanced concepts, applications and technologies in Remote Sensing for Hazards Analysis. The main emphasis of this course is satellite remote sensing applications in Hazards studies, such as flood/drought, tornadoes/hurricanes, urban heat, and wild fires. The course may be modified according to students' interests. Prerequisites: GE 184, GE 354, GE 384 . (Spring)

Course Fees: \$60

GE 688. Modeling and Analysis in GIS. (3 Credits)

This is a graduate level course in modeling and analysis at GIS framework. Spatial analysis and modeling involves the use of mathematical and computational methods in conjunction with spatial data to explore human and environmental systems. These methods span a range of spatial analysis and modeling approaches, including spatial decision making, spatial statistics, cognition of spatial information, uncertainty representation, representation of multivariate and temporal geographic data, and visualization applications that use senses other than vision. This course is a fundamental part of Geographic and Environmental Studies methodologies. This course is designed to introduce the student to a broad range of spatial analysis and modeling methods. There are no official prerequisites for this course. However, students are expected to understand basic algebra and mathematical concepts, and basic experience in GIS. A general working knowledge of computers, modern operating systems, word processing software, and spreadsheet programs will be necessary. (Fall)

Course Fees: \$60

GE 692. Research. (3 Credits)

Selection of a research topic, collection and analysis of primary and secondary sources, field work, and composition of research paper under faculty supervision. May be taken more than once. Prerequisite: Permission of supervising faculty and graduate director. (Fall, Spring, Summer)

Course Fees: \$60

GE 695. Thesis. (3-6 Credits)

Selection of a thesis topic, collection and analysis of primary and secondary sources, field work, and composition of thesis and thesis defense under faculty supervision. May be taken more than once. Prerequisite: Permission of supervising faculty and graduate director. (Fall, Spring, Summer)

Course Fees: \$60

GE 697. Advanced Topics. (3 Credits)

Selected topics in geospatial science offered by faculty. May be repeated for credit if the topic is different. Prerequisite: Permission of instructor required in order to enroll. (Fall, Spring, Summer)

Course Fees: \$60

GE 699. Thesis and Research and Defense. (0 Credits)

This course serves as an orientation to and administration of an oral examination for the MS in Geospatial Science program. A non-credit course required of all candidates for the thesis and non-thesis options. The course is to be taken during the last term in which the student is expected to complete all other program requirements. A grade of "S" indicating satisfactory performance or a grade of "U" for unsatisfactory performance will be recorded on the transcript. A grade of "S" is required for graduation; the course may be repeated once. Prerequisite: student must have completed all other program requirements or be enrolled in the last course for program completion. (Fall, Spring, Summer)

Course Fees: \$60