

# Geography and Envir Studies (GES)

---

## Courses

### **GES-104. World Geography. 3 Hours.**

Students will study the major world regions using a geographic perspective which includes both the physical environment (e.g., climate, soils, natural resources, topography) and the human environment (e.g., population, economic, political, urban, trade, culture, language). The course includes map interpretation and a brief introduction to modern geospatial technologies.

### **GES-109A. First Year Experience: Global Chicago. 3 Hours.**

This First Year course provides a broad overview of the Chicago metropolitan area in the global context and within the framework of urban geography. Students will explore Chicago as a hub in the global economy and the many ways in which global forces have impacted the region.

### **GES-109B. First Year Experience: Humans And The Chicago Environment. 3 Hours.**

Students will explore the relationships between human settlement and the natural environment in the Chicago metropolitan area including local environmental problems, their causes, and their possible solutions. Issues such as waste disposal, recycling, brownfields, suburban sprawl, air and water pollution, water supply, flooding and drainage, invasive species, and urban parks are investigated with classroom discussion. Some field trips are possible.

### **GES-150. Introduction To Environmental Studies. 3 Hours.**

This is an introduction to the study of human-environment relations with a focus on sustainable solutions to environmental problems. Students will learn about fundamentals of environmental systems, human impacts on the environment, and sustainable solutions to environmental issues from local to global scales.

### **GES-180. Fundamentals Of Data Science. 4 Hours.**

Foundations of data science considers data from three perspectives: inferential thinking, computational thinking, and real-world relevance. Given data arising from some real-world phenomenon, how does one analyze that data to understand that phenomenon? The course teaches critical concepts and skills in computation and statistical inference, in conjunction with hands on analysis of real-world datasets, including economic data, document collections, geographical data, and data from social networks. It delves into social, ethical, and legal issues surrounding data analysis, including privacy and data ownership.

**Prerequisite:** MATH-173 with a minimum grade of C.

### **GES-199. Topics In Environmental Studies For Middle School Teaching. 4 Hours.**

### **GES-205. Physical Geography. 3 Hours.**

This course introduces students to the geographic distribution and interrelations of Earth's physical environment from a systems perspective. It emphasizes Earth-Sun relations, climate systems, soil, vegetation, and landform types and processes.

### **GES-218. Conservation Of Natural Resources. 3 Hours.**

This course introduces students to contemporary approaches to natural resource management emphasizing efforts toward conservation and preservation. Students will learn how to manage a range of resources such as air, water, soil, forests, grasslands, energy and minerals, and wildlife. They will study the processes, problems, and management methods for different resource types.

### **GES-250. Writing Intensive Program: Writing in GES. 3 Hours.**

In this writing intensive course students develop written communication skills relevant to Geography and Environmental Studies. Topics include note taking, outlines, drafts, writing styles, bibliography and references, essays, reviews, policy statements and reports of varying lengths. Library and online writing resources will be explored. Students will incorporate maps, graphs, and other visual aids.

**Prerequisite:** ENGL-101 with a minimum grade of C.

### **GES-301. Great Lakes Environmental Management. 3 Hours.**

This course will survey human/environmental issues in the Great Lakes basin with an emphasis on environmental policy, planning, governance, and management. Topics include water resource use and management, wildlife management, industrial, urban and agricultural pollution and abatement, inter-state and inter-national transportation, and resource conflicts and solutions. Some field trips are possible.

### **GES-302C. Regional Geography: Africa. 3 Hours.**

This is a descriptive and explanatory study of a major region. Emphasis is placed on the region's defining human/social and physical factors, on its distinct problems and opportunities, and its role in a wider spatial context.

### **GES-302D. Regional Geography: World Oceans. 3 Hours.**

Students will study the geography and distribution of the oceans: physical geography of the ocean floor, coastal landforms, earthquakes and volcanoes, oceans and climate, life in the oceans, ocean resources, and human impacts. Contemporary problems and future opportunities include laws of the sea; transportation, and the importance of the oceans to environmental quality of Earth.

### **GES-302F. Regional Geography: Australia And The Pacific Islands. 3 Hours.**

This is a descriptive and explanatory study of a major region. Emphasis is placed on the region's defining human/social and physical factors, on its distinct problems and opportunities, and its role in a wider spatial context.

**GES-302G. Regional Geography: Caribbean. 3 Hours.**

This is a descriptive and explanatory study of a major region. Emphasis is placed on the region's defining human/social and physical factors, on its distinct problems and opportunities, and its role in a wider spatial context.

**GES-302H. Regional Geography: Eastern Europe. 3 Hours.**

This is a descriptive and explanatory study of a major region. Emphasis is placed on the region's defining human/social and physical factors, on its distinct problems and opportunities, and its role in a wider spatial context.

**GES-302K. Regional Geography: East Asia. 3 Hours.**

This is a descriptive and explanatory study of a major region. Emphasis is placed on the region's defining human/social and physical factors, on its distinct problems and opportunities, and its role in a wider spatial context.

**GES-302L. Regional Geography: Southeast Asia. 3 Hours.**

This is a descriptive and explanatory study of a major region. Emphasis is placed on the region's defining human/social and physical factors, on its distinct problems and opportunities, and its role in a wider spatial context.

**GES-302M. Regional Geography: Russia And Central Asia. 3 Hours.**

This is a descriptive and explanatory study of a major region. Emphasis is placed on the region's defining human/social and physical factors, on its distinct problems and opportunities, and its role in a wider spatial context.

**GES-302N. Regional Geography: South Asia. 3 Hours.**

This is a descriptive and explanatory study of a major region. Emphasis is placed on the region's defining human/social and physical factors, on its distinct problems and opportunities, and its role in a wider spatial context.

**GES-302O. Regional Geography: Middle East. 3 Hours.**

This is a descriptive and explanatory study of a major region. Emphasis is placed on the region's defining human/social and physical factors, on its distinct problems and opportunities, and its role in a wider spatial context.

**GES-302Q. Regional Geography: Western Europe. 3 Hours.**

This is a descriptive and explanatory study of a major region. Emphasis is placed on the region's defining human/social and physical factors, on its distinct problems and opportunities, and its role in a wider spatial context.

**GES-302S. Regional Geography: Developing World. 3 Hours.**

This is a descriptive and explanatory study of a major region. Emphasis is placed on the region's defining human/social and physical factors, on its distinct problems and opportunities, and its role in a wider spatial context.

**GES-302V. Regional Geography: U.S. And Canada. 3 Hours.**

This is a descriptive and explanatory study of a major region. Emphasis is placed on the region's defining human/social and physical factors, on its distinct problems and opportunities, and its role in a wider spatial context.

**GES-302X. Regional Geography: Latin America. 3 Hours.**

This is a descriptive and explanatory study of a major region. Emphasis is placed on the region's defining human/social and physical factors, on its distinct problems and opportunities, and its role in a wider spatial context.

**GES-303. Geography And Disability: Space, Place, And Power. 3 Hours.**

Students will study the social and geographic processes rendering some bodies disabled and others abled in space and place. The landscape of experience at different scales, mobility, geography of disability services, mapping as a form of representation, urban policies, and planning will be covered. Instruction may include critical debates, field trips and guest speakers.

**GES-303A. Topics In Geography: Social Geography. 3 Hours.**

A current topic in geography will be explored in depth. See Schedule of Classes, course notes, and consult the department for more information.

**GES-303B. Topics In Geography: American Cities: Past, Present And Future. 3 Hours.**

This is an overview of geographic and historical development of American cities and an evaluation of contemporary urban issues. It emphasizes spatial processes within cities and within the larger urban system. Using fundamental aspects of urban theory students will discuss how cities developed and how processes such as suburbanization affect the social, economic and environmental aspects of city life.

**GES-305. Geography And Map Skills For Teachers. 3 Hours.**

Students will review the structure and content of both physical and human geography as well as the themes and standards of geography education. Basic educational concepts will be covered, as will instructional strategies for integrating geographic, geospatial, and GIS concepts into curriculum. This course is intended for those who plan to become formal or informal educators in Grades K-12.

**GES-307. Environmental Education. 3 Hours.**

This course offers an exploration and analysis of educational theory, various instructional methods, and the design of environmental education and outreach programs. Students will gain practical knowledge in lesson plan design and implementation, current research trends in environmental education, and various conservation-based field techniques related to environmental programming. Curricular development skills will be applied in the context of contemporary environmental issues.

**GES-308. Conservation Psychology. 3 Hours.**

Students will explore the emerging field of conservation psychology with an emphasis on the psychological characteristics of the relationship between humans and nature, such as environmental values, attitudes, behavior, and decision-making practices. Course topics, including environmental perception, identity, personal morals, ecopsychology, wilderness psychology, domestic nature, managed nature, community dimensions, and environmental education, will be investigated in the context of promoting environmental responsibility.

**GES-309. Principles And Methods Of Environmental Interpretation. 3 Hours.**

Students will explore the art of interpreting the natural environment of various settings (e.g., parks, camps, historical markers, places of cultural significance) for visitors. Students will practice a variety of interpretive activities and techniques including storytelling, interpretive talks, role-playing, interpretive signage, and guided programs. Projects include the creation of unique interpretive programming under instructor guidance and possibly with external clients. Some field trips are possible.

**GES-311. Social Dimensions Of Water Resources Management. 3 Hours.**

This course examines the social dimensions of water resources management and development by examining the relationship between humans and the hydrological cycle in the U.S. and world regions. Students will draw from key social theoretical frameworks to better understand and explain the development, use, management, and governance of water resources by humans at various scales and in different settings. Human impacts on natural water systems, the influence of natural water systems on humans, and water conflicts and resolutions will be highlighted. Field trips are possible.

**GES-314. Political Geography. 3 Hours.**

Students will study the relationship between geographical factors of the physical and human environments and political organization. Topics include territorial claims and conflicts, defining borders and districts, spatial patterns of legislation, development and evolution of nations, and changing patterns in the world political map.

**GES-315. Economic Geography. 3 Hours.**

Students will explore how economic activities are organized in space at the local, regional and global levels. Geographic frameworks, concepts, explanations and analytical tools will be used to show how space and location are critical elements affecting economic systems and why different places achieve different levels of well-being.

**GES-316. Location Analysis. 3 Hours.**

This course focuses on the use of location theory and economic modeling to understand spatial patterns of land use and to determine optimal spatial arrangements relating to location of business, services, resources and trade. Environmental influences and impacts are discussed.

**GES-319. Environmental And Natural Resources Policy. 3 Hours.**

This course analyzes environmental and natural resource policy development, implementation, and revision. It emphasizes contemporary political, environmental, economic, and legal aspects of US federal and state environmental policies in a global.

**GES-321. Environmental Impact Assessment. 3 Hours.**

Students will analyze the National Environmental Policy Act (NEPA) and its requirement of environmental impact assessment. Topics include NEPA requirements, categories and methods of environmental assessment; agency direction for implementing NEPA; impact assessment in planning and decision making; and public participation and conflict management.

**GES-322. Aerial Photo Interpretation. 3 Hours.**

This course introduces the use of aerial photographs for evaluating natural and built environments. Students will gather and study information in order to identify various cultural and natural features from aerial photographs.

**GES-323. Green Infrastructure Planning And Management. 3 Hours.**

This course focuses on the challenges and benefits of incorporating open space, native landscaping, street trees, etc. into urban planning to ameliorate problems such as erosion, storm water management, climate change, habitat loss, and pollution. Plans at differing scales will be compared; case studies of green infrastructure implementation will be examined; and management and maintenance of green infrastructure practices will be discussed. This is a GES-approved field class. Most classes will be held in the field.

**GES-327. Forest Resource Management. 3 Hours.**

Students will study forest values, management, policies and practices for public and private lands, including national wilderness areas, parks and forests, and the role of trees and forests in urban areas. Some field trips are possible.

**GES-328. Wildlife Resource Management. 3 Hours.**

This is a general wildlife management course designed for resource planners, environmental managers, interpretive naturalists, and educators. Fish and wildlife values, conservation principles and practices, and current policy issues will be covered.

**GES-329. Sustainable Energy Policy. 3 Hours.**

Students will study renewable energy resources such as solar, wind, hydro, and biomass sources as alternatives to nuclear energy and traditional fossil fuels. They will examine sustainable energy policy and other ways energy resources can be managed towards a sustainable future.

**GES-336. Solid Waste Issues. 3 Hours.**

This course examines trends in municipal solid waste generation, collection, disposal and management. Students will explore and discuss the roles of federal, state, county, and municipal governments and policies. International waste issues and management strategies will also be covered.

**GES-337. Cultural Geography. 3 Hours.**

This course will focus on the cultural landscape including patterns of language, religion, ethnicity, gender, and livelihoods as they vary from region to region around the world.

**GES-338. Sustainable Development. 3 Hours.**

Sustainable development is an alternative to traditional industrial-economic models of growth which often marginalize people and damage ecosystems. The course will cover specific strategies, policies, and implications of the sustainable development approach globally. Environmental, social, and economic aspects of development will be examined at various scales.

**GES-339. Geography Of Energy. 3 Hours.**

This course examines the changing spatial patterns of the distribution, consumption, and transportation of energy resources in the US and world regions. Students will investigate new technologies and management strategies for production and delivery of energy resources. Some field trips are possible.

**GES-344. Chicago River Issues. 3 Hours.**

This field class explores the geographic, environmental, historic, economic, engineering, recreation and other aspects of the Chicago River. Students will study water quality, land use and ownership issues, habitat restoration, and the importance of rivers in metropolitan areas. As a GES- approved field class, most classes are held in the field and will include light hiking and paddling.

**Prerequisite:** (100 - 399 or 100A - 399Z).

**GES-345. Medical Geography. 3 Hours.**

The course will cover health-related topics including infectious and non-infectious diseases, from a spatial perspective. Ecological, social, and spatial factors affecting health and disease will be studied, as will the tools and methods of intervention. Special attention is given to the effects of globalization and urbanization on health and disease.

**GES-346. Geography Of Metropolitan Chicago. 3 Hours.**

This is a detailed study of communities within Chicago and its surrounding area with an emphasis on the formation and spatial distribution of distinct regions. Some field trips are possible.

**GES-347. Gentrification And Urban Redevelopment. 3 Hours.**

Students will examine the processes and effects of gentrification, revitalization, restoration and urban redevelopment both in metropolitan Chicago and globally. Some field trips are possible.

**GES-348. Latinx Metropolis. 3 Hours.**

This course explores the processes of Latinx urbanization and urbanism in the United States and the spatialization of Latinx identities and experiences. As more Latinxs live and work in U.S. cities, they gradually transform the social relations and spatial practices that manifest the geographical and historical legacies of previous waves of urbanization, to suit their varied needs and to express their own diverse values. As U.S. urban spaces increasingly become loci that constitute, constrain and mediate the life experiences of Latinxs, they become sites laden with political and social potential poised to transform our collective urban futures.

**Prerequisite:** (100 - 399 or 100A - 399Z).

**GES-349. Environment And Urbanization. 3 Hours.**

The course focuses on urban development emphasizing the role of the natural environment in cities around the world. The rapid growth of urban areas both within and beyond core regions will be studied, with special attention paid to the environmental factors affecting urbanization and the impacts of urbanization on the natural environment.

**GES-350. Climate Change: International Policy And Politics. 3 Hours.**

This course covers international climate change policy and politics in the context of global capitalism, with a focus on efforts to limit the causes (mitigation) and impacts (adaptation) since the signing of the UN Framework Convention on Climate Change in 1994. The course emphasizes the disproportionate impacts of climate change on the global South and marginalized communities in the global North. Students will assess mitigation and adaptation strategies in countries and regions from a people-centered, place-based approach that respects local socio-ecological contexts and environmental justice perspectives.

**GES-351. Spatial Statistics. 3 Hours.**

This course introduces students to the fundamentals of spatial statistics. Students will explore statistical problems, principles, and techniques for the study of geographic and environmental phenomena with spatially referenced data.

**GES-352. Independent Study In Geography And Environmental Studies. 3 Hours.**

Students will study a topic of special interest under the supervision of a faculty member. See the Department policy on independent studies.

**GES-353. Independent Study In Geography And Environmental Studies. 2 Hours.**

(See GES-352 for description.).

**GES-354. Independent Study In Geography And Environmental Studies. 1 Hour.**

(See GES-352 for description.).

**GES-355. Metropolitan Transportation: Problems And Planning. 3 Hours.**

This course presents a study of the location, impact, causes, and mitigation of natural hazards globally. Example topics include earthquake, volcano, flooding, landslide, subsidence, extreme weather, wildfire, and tsunamis. Hazard mitigation will also be covered. Some field trips are possible.

**GES-357. Geography Of Natural Hazards. 3 Hours.**

This course presents a study of the location, impact, causes, and mitigation of natural hazards globally. Example topics include earthquake, volcano, flooding, landslide, subsidence, extreme weather, wildfire, and tsunamis. Hazard mitigation will also be covered. Some field trips are possible.

**GES-358. Museum Studies. 3 Hours.**

This course takes a multi-disciplinary approach to the study of museums, cultural heritage institutions, and natural history organizations and the contemporary issues and challenges facing them. Students will examine the theory and organization of museums as well as their historical and contemporary role in education, cultural preservation, research, and interpretation. This course will also take a critical look at the role of museums in colonialist endeavors, and at how they address social hierarchies, race, and ethnicity. Students will enrich their classroom learning with working visits to a diversity of institutions in the Chicago area. Course is open to all majors.

**GES-359. Environmental Planning. 3 Hours.**

In this course students will learn how to incorporate environmental factors into land use and resource planning. They will explore interrelations between physical systems and land use; they will identify tools and resources for ecologically sound analysis and planning; and will develop an environmental plan of their own.

**GES-360. Environmental Justice And Activism. 3 Hours.**

Students will investigate the history and process of environmental equity, grassroots activism, legislation and lobbying, and community organization. Some field trips are possible.

**GES-361. Urban Planning. 3 Hours.**

Students will study the historical development of urban planning in the United States, the components of a comprehensive plan, and the theory and practice of urban planning.

**GES-362. Population Geography. 3 Hours.**

Population structure, growth/decline, distribution, and migration from local to global scales will be covered. The impact of population structure on economic growth, and problems including environmental degradation and human suffering will be discussed. The course will also cover population policies and initiatives.

**GES-3631. Field Experience:Problems In Geography. 3 Hours.****GES-365. Urban Geography. 3 Hours.**

This survey course in urban geography focuses on processes and outcomes of urbanization. It will address the changes unfolding in the metropolitan landscape and will encourage students to develop a deeper and more nuanced understanding of cities and urban socio-spatial processes.

**GES-367. Geography Of Tourism. 3 Hours.**

Students will examine tourism from a geographic and environmental perspective. Topics include political and economic impact on communities, ecotourism, and the cultural consequences of tourism in different world regions. Students will investigate a local tourist site. Some field trips are possible.

**GES-368. Climate Change: Changing Climate, Changing Chicago. 3 Hours.**

This course focuses on climate change mitigation and adaptation efforts in the Chicago metropolitan region. Students will learn how physical geographers evaluate historical climate conditions as well as project future climates, and how to apply this information to planning problems. A majority of the class will emphasize the ongoing creation and use of local, county, state, and regional climate change mitigation and adaptation plans.

**GES-370. Interdisciplinary Seminar On Climate Change. 2 Hours.**

This university-wide seminar provides important views on the critical issue of climate change, drawing from many perspectives and disciplines. Faculty from different NEIU departments and other institutions will present an overview of socio-economic, political, cultural, racial, gender, ethical, and scientific perspectives on the issue of climate change. The main objective of the seminar is to gain an understanding of the dynamic linkages and feedbacks between the climate system and society and to critically evaluate climate change solutions in the context of sustainability and social & environmental justice.

**GES-371. Advanced Physical Geography. 3 Hours.**

This course will cover advanced topics in physical geography, focusing primarily on geomorphic systems (e.g., rivers, glaciers, deserts, coastal zones, karst) and biomes. It will cover contemporary approaches to physical geography as a discipline.

**Prerequisite:** GES-205 with a minimum grade of C.

**GES-372. GIS Across Disciplines. 3 Hours.**

This course introduces students to the fundamental concepts of Geographic Information Systems (GIS) and its application in a variety of disciplines including both social and natural sciences. Students will also gain hands-on experiences of collecting and manipulating spatial data and creating effective maps.

**GES-374. Research Methods. 3 Hours.**

This course explores the foundations and tools of research including quantitative, qualitative, and mixed-methods approaches used in Geography and Environmental Studies. Students will conduct original research from topic selection and development of a research question to a finished paper and presentation. They will gain skills in data collection, analysis, and interpretation as well as in professional writing and presentation.

**Prerequisite:** GES-250 with a minimum grade of C and (GES-104 with a minimum grade of C or GES-150 with a minimum grade of C).

**GES-376. Principles Of Cartography. 3 Hours.**

This course covers principles of map making, the history of cartography, evolution of modern techniques, projections, symbolization, visual appeal, thematic mapping techniques, design, production and interpretation.

**GES-377. Computer Cartography. 3 Hours.**

Students will design, create, and publish a variety of thematic maps using digital graphics programs. The course will include cartographic conventions, aesthetic considerations, and effective symbology.

**GES-380. Field Methods. 3 Hours.**

Introduction to the instruments, measurements, mapping techniques, and sampling procedures used to acquire primary data from field observations. Development of a field research plan, culminating research projects tailored to each student's interest. Approved for graduate credit.

**GES-383. Internship In Geography And Environmental Studies. 3 Hours.**

This is a supervised field experience with an agency related to the student's career interest. Prior course work and other disciplinary experiences are evaluated before approval is granted to enroll in the internship. Students will work closely with their advisor in advance of enrollment and will have regular contact throughout the course. There is a formal process for reporting and assessment and 160 work hours are required. This is a GES-approved field class.

**GES-387. Interactive Cartography. 3 Hours.**

This course focuses on cartographic techniques for web delivery of interactive maps. Students learn basic coding and script modification for interactive map images, and preparation of base maps and data. Emphasis is placed on widely available open source tools. Students will design and complete a research project using new skills for interactive mapping.

**Prerequisite:** (100 - 399 or 100A - 399Z).

**GES-388. Field Camp. 3 Hours.**

Students must consult the Schedule of Classes for specific destination and costs for this travel-based course. Departmental approval is required for enrollment. There will be classroom meetings prior to travel for discussion of the geographic and environmental issues of the destination. Student will perform a research project based on literature review and field work. This is a GES- approved field class.

**GES-389. Urban Design Studio. 3 Hours.**

This studio course presents perspectives, standards and techniques used in representing urban plans and projects. Cultural, economic, political and social dimensions of urban life are incorporated in the computer assisted design projects.

**GES-390. Remote Sensing And Digital Image Processing. 3 Hours.**

This course focuses on the analysis of remotely sensed data for geographic and environmental applications including the detection of a variety of resources in the natural and human environments, measurement of change, and human impact.

**Prerequisite:** (100 - 399 or 100A - 399Z).

**GES-391. Introduction To GIS. 3 Hours.**

This course is an introduction to Geographic Information Systems (GIS) technology for research applications. Students will study the conceptual and technical process of GIS research including project design, data acquisition, data manipulation, analysis, interpretation and display.

**GES-392. Geospatial Analysis. 3 Hours.**

This course introduces advanced skills in Geographic Information Systems (GIS), including the concepts, methods and techniques of geospatial analysis and modeling. A variety of spatial data geoprocessing tools will be explored, using both raster and vector formats. Students will apply GIS tools and skills to a real world problem.

**Prerequisite:** GES-391 with a minimum grade of C.

**GES-393. GIS Modeling And Programming. 3 Hours.**

This course focuses on advanced analysis of Geographic Information Systems (GIS) data using scripts and programming. Topics will include database management, model building, scripting and programming, and open source GIS. Students will complete several projects related to the course topics.

**Prerequisite:** GES-391 with a minimum grade of C.

**GES-395. GIS Internship. 3 Hours.**

This course is a supervised field experience using Geographic Information Systems (GIS) and related geospatial technologies. A proposal and departmental approval is required in advance of registration. There is a formal process for reporting and assessment, and 160 work hours are required. Students should consult Department materials for specific guidelines and instructions. This is a GES- approved field class.

**Prerequisite:** GES-391 with a minimum grade of C.

**GES-396. Food And The City. 3 Hours.**

In the face of growing awareness of the environmental impacts of conventional agriculture, food insecurity, and climate change, many view urban agriculture as a promising solution to a variety of socio-economic and environmental concerns. This course will examine the historical development, current versions, and future potentials of urban food production in a geographic context. Some field trips are possible.

**GES-401. Seminar In Cultural Geography. 3 Hours.**

This course will explore dimensions of the cultural landscape emphasizing the influence of location and place in the creation, shaping, and maintenance of cultural regions. Cultural change and interactions will be studied at various scales of analysis.

**GES-411. Scope And Philosophy Of Geography And Environmental Studies. 3 Hours.**

This is a historical and theoretical review of geography as a spatial discipline, and of the philosophy of conservation and environmental studies. The relationship between these two fields will be examined. The course also provides an overview of the M.A. program and graduate level studies.

**GES-413. Advanced Research Methods. 3 Hours.**

This course develops concepts and skills for those preparing for graduate research (thesis or research paper) in the Department of Geography and Environmental Studies or related social science fields. Research design, data-gathering techniques, data analysis, research planning, and quantitative, qualitative, and mixed method approaches will be covered. Students will interpret published research and produce a research proposal.

**Prerequisite:** GES-411 with a minimum grade of C.

**GES-415. Geospatial Data Analysis. 3 Hours.**

This course covers the use of contemporary tools used in the design and preparation of thematic maps. It also provides an overview of spatial analyses now possible with geographic information systems (GIS). Topics include data collection, input, storage, retrieval, manipulation and output.

**GES-416. GIS For Natural Systems Management. 3 Hours.**

This course introduces students to the theory and concepts of data storage, retrieval, visualization, modelling, and output for natural resource applications and management. Mainly with the use of raster GIS students will design and complete their own research projects.

**Prerequisite:** GES-391 with a minimum grade of C or GES-491 with a minimum grade of C.

**GES-417. Urban Information Systems. 3 Hours.**

This course focuses on the application of GIS in the urban environment. Topics will include suburbanization, segregation, economic development, network-based transportation and site location. Students' exploration will culminate in independently designed research projects.

**Prerequisite:** GES-391 with a minimum grade of C or GES-491 with a minimum grade of C.

**GES-424. Human Dimensions Of Global Environmental Change. 3 Hours.**

This course introduces students to the role of humans in driving environmental change at local to global scales. They will integrate knowledge of human and non-human systems to enhance their understanding of contemporary global environmental problems. By studying academic literature connecting social and ecological systems they will explore the causes and consequences of human activities in relation to anthropogenic issues such as climate change and biodiversity loss. They will also study ways to mitigate or adapt to these changes.

**GES-430. Research Seminar. 3 Hours.**

Students conduct a focused and comprehensive literature review, and write a research paper on an approved topic to fulfill requirements for the Master of Arts degree. Credit for both this course and the Thesis Seminar will not be permitted. A proposal must be approved by both committee members in advance of registration. See Departmental policies.

**GES-435. Seminar In Physical Geography. 3 Hours.**

Students will investigate geomorphic systems and the importance of physical geography for studying the Earth. This course will introduce contemporary principles, models, and theories of physical geography, with special attention paid to the application of physical geographic knowledge for G&ES scholars and professionals.

**Prerequisite:** GES-205 with a minimum grade of C.

**GES-437. Seminar: Global Wildlife Issues. 3 Hours.**

Wildlife ecology, management, and policy are studied from global to local scales. Topics will include evolution and distribution of wildlife, habitat and territory, biomes and ecosystems. Human impacts will also be studied. These include habitat loss/disruption, hunting, pollution, introduction of new species and conservation efforts, environmental ethics, and environmental policies.

**GES-440. Qualitative Research Methods In Geography And Environmental Studies. 3 Hours.**

Students will explore qualitative analytical tools and methods used in geography and environmental studies. They will develop the foundational philosophical knowledge of qualitative inquiry while practicing and applying various qualitative techniques related to the study of complex human-environment phenomena. Individual research projects will involve collecting, analyzing, and representing qualitative data.

**Prerequisite:** GES-411 with a minimum grade of C and GES-413 with a minimum grade of C.

**GES-442. Geographic Problems In Quantitative Measurements. 3 Hours.**

This course focuses on quantitative and statistical tools used in geography and environmental studies. It will cover common statistical measures and will emphasize geometrics and spatial analyses. Statistical projects are required.

**GES-445. Seminar In Resource Management And Decision-Making. 3 Hours.**

This research seminar incorporates principles of resource management and environmental governance through research projects conducted in the Chicago metropolitan area.

**GES-448. Seminar: Latinx Metropolis. 3 Hours.**

This course explores the processes of Latinx urbanization and urbanism in the United States and the spatialization of Latinx identities and experiences. As more Latinxs live and work in U.S. cities, they gradually transform the social relations and spatial practices that manifest the geographical and historical legacies of previous waves of urbanization, to suit their varied needs and to express their own diverse values. As U.S. urban spaces increasingly become loci that constitute, constrain and mediate the life experiences of Latinxs, they become sites laden with political and social potential poised to transform our collective urban futures.

**GES-449. Seminar In Land Use Controls. 3 Hours.**

Students will explore the rationale and methods of private land regulation: land subdivision, zoning, regulations, and growth control. Research projects are required.

**GES-450. Seminar In Urban Planning. 3 Hours.**

This is a broad overview of urban planning as it is practiced in the United States and in the Chicago metropolitan area. It focuses on the fundamental theoretical perspective as well as on the common regulatory and procedural tools utilized by planning professionals. Students will examine the historical context and evolution of the planning profession, the complex issues associated with urbanization, and of the role of planning in contemporary society.

**GES-453. Seminar In Sustainable Development. 3 Hours.**

This is an advanced study of sustainable development in the context of science, economics, politics, culture, ecology, and ethics. Development and globalization are critiqued from a political economy perspective and both strengths and limitations of conventional systems are investigated. Institutions, policies, and strategies are analyzed, as are indicators of sustainability and development.

**GES-454. Seminar: Population And Environment. 3 Hours.**

Students will investigate population dynamics at various scales, including distribution and structure, theories, trends, projections, and policies. Environmental constraints and impacts of population on the natural environment will be explored.

**GES-455. Seminar In Environmental Planning. 3 Hours.**

Proactive land use strategies to minimize pollution, protect biodiversity and water and energy resources, and reduce vulnerability to natural hazards will be explored. Issues such as smart growth, sustainable transportation, sprawl, watershed management, preservation, natural hazard mitigation, and green design will be discussed with emphasis on those in the Chicago area. Tools will include GIS, economic analysis, and environmental impact assessment. Some field trips are possible.

**GES-456. Seminar In U.S. Environmental Policy. 3 Hours.**

This is a detailed exploration of environmental law and policy in the United States, including legal structures, processes, and constraints, notable successes and failures, the role and influence of advocacy and interest groups, and major controversies relating to decentralization, market-based mechanisms, risk-based analysis, environmental justice, and others. Differences in state laws and performance will also be explored.

**GES-457. Seminar: International Environmental Policy. 3 Hours.**

Students will study international efforts to address global environmental problems such as deforestation, climate change, ozone depletion, fisheries decline, and toxic chemicals. They will analyze the effectiveness of these measures. The class will explore various theories and philosophies, international regimes, international cooperation, and the promoters of and obstacles to progress. The impact of globalization, of regional disparities, and of international organizations will be examined.

**GES-461. Independent Study In Geography And Environmental Studies. 3 Hours.**

This independent research is on a topic chosen by the student in consultation with the instructor and approved in advance of registration.

**GES-462. Seminar In Environmental Education. 3 Hours.**

In this course students will explore, analyze, and critique advanced environmental education theories and practices. Students will gain an understanding of pedagogical tools and techniques related to a variety of ages, locations, and mechanisms of conservation education. Foundational knowledge will be combined with current research trends in the context of individualized projects.

**GES-470. Seminar in Health & Medical Geography. 3 Hours.**

This seminar focuses on the intensive study of sociospatial patterns that characterize public health challenges and outcomes, including a host of health disparities across a broad spectrum of intersectionalities that include gender, race, ethnicity, class, sexuality, ability, age, etc. The students are immersed in a rigorous examination of relevant current scholarly literature. They learn how to apply key geographic concepts and methods on case-studies to analyze the health effects of interactions between people and their environments. Special attention is given to the impact of globalization and urbanization on health at various scales of analysis.

**GES-471. Seminar In Urban Geography. 3 Hours.**

Students will research and discuss current topics and theories from the academic literature in urban geography.

**GES-472. Seminar In Regional Geography: Third World Issues. 3 Hours.**

Students will examine the less developed world regions based on current geographical perspectives of development processes. Topics will include social inequity, resource exploration, economic development, and demographic change. Students will develop their own research areas, incorporating the academic literature.

**GES-483. Internship. 3 Hours.**

This is a supervised field experience (160 work hours) with an agency related to the student's career interest. Prior course work and other experience is evaluated before approval is granted to enroll in the internship. See Department policies and internship procedures.

**GES-487. Interactive Cartography. 3 Hours.**

This course focuses on cartographic techniques for web delivery of interactive maps. Students learn basic coding and script modification for interactive map images, and preparation of base maps and data. Emphasis is placed on widely available open source tools. Students will design and complete a research project using new skills for interactive mapping.

**GES-490. Remote Sensing And Digital Image Processing. 3 Hours.**

This course focuses on the analysis of remotely sensed data for geographic and environmental applications including the detection of a variety of resources in the natural and human environments, measurement of change, and human impact.

**GES-491. Introduction To GIS. 3 Hours.**

This course is an introduction to Geographic Information Systems (GIS) technology for research applications. Students will study the conceptual and technical process of GIS research including project design, data acquisition, data manipulation, analysis, interpretation and display.

**GES-492. Geospatial Analysis. 3 Hours.**

This course introduces advanced skills in Geographic Information Systems (GIS), including the concepts, methods and techniques of geospatial analysis and modeling. A variety of spatial data geoprocessing tools will be explored, using both raster and vector formats. Students will apply GIS tools and skills to a real world problem.

**Prerequisite:** GES-391 with a minimum grade of C or GES-491 with a minimum grade of C.

**GES-493. GIS Modeling And Programming. 3 Hours.**

This course focuses on advanced analysis of Geographic Information Systems (GIS) data using scripts and programming. Topics will include database management, model building, scripting and programming, and open source GIS. Students will complete several projects related to the course topics.

**Prerequisite:** GES-391 with a minimum grade of C or GES-491 with a minimum grade of C.

**GES-499. Capstone Portfolio. 3 Hours.**

This course serves as the capstone project for non-thesis students completing the Master of Arts degree in Geography and Environmental Studies. The capstone portfolio requires students to work closely with faculty members to compile completed work within the context of the goals and objectives of the MA program.

**GES-5901. Thesis Hours. 1 Hour.**

Under the supervision of three advisors students conduct independent research and write a thesis to fulfill requirements for the Master of Arts degree. Credit for this course and GES-430 will not be permitted. See Department policies.

**GES-5902. Thesis Hours. 2 Hours.**

Under the supervision of three advisors students conduct independent research and write a thesis to fulfill requirements for the Master of Arts degree. Credit for this course and GES-430 will not be permitted. See Department policies.

**GES-5903. Thesis Hours. 3 Hours.**

Under the supervision of three advisors students conduct independent research and write a thesis to fulfill requirements for the Master of Arts degree. Credit for this course and GES-430 will not be permitted. See Department policies.