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Geography and Environmental Resources

Geography and Environmental Resources is the study of place and space; the intersection of the physical environment and human activities; patterns of climate, land forms, soils and water. Majors earning a Bachelor of Science degree in Geography and Environmental Resources study the environment in the field, the computer laboratory, and the traditional classroom. Job opportunities for our degree are broad and diverse. Graduates of our program have careers that include: Sustainability Coordinator, GIS Coordinator, Geospatial Intelligence Analyst, Environmental Educator, Cartographer, Emergency Manager, Natural Resource Consultant, Regional Planner, Water Quality Manager, among others.

SIU Carbondale's program in Geography and Environmental Resources focuses on environmental geography. Faculty expertise is in water resources, land use, climate science, and geospatial techniques. Our courses are taught by faculty with excellent national and international reputations in their fields. We take an integrated environmental problem-solving approach in our courses. Our Environmental GIS Laboratory provides our students with current GIS and remote sensing technologies for environmental analysis. Many courses have labs to provide students with more personal attention. We also have an active mentoring program, through which every undergraduate has access to a faculty member and hands-on learning experiences.

Our undergraduate program is divided into two parts: Major Courses and Specialization. First, there are seven courses taken by all Geography and Environmental Resources majors to ensure that all of our students have an understanding of key concepts and tools used by professionals in the field. Then, students select one of two areas of specialization: 1) Environmental Geography and Sustainability is intended for students who want a broad background in the social and environmental sciences that relates to applied environmental management, or 2) Geographic Information Science is intended for students who are interested in applying geospatial technologies to geographic and environmental problems.

Practical experience is an important part of our program. We have an active internship program that places students with local natural resource agencies. Students receive academic credit for these internship and cooperative work experiences. Our program provides several awards and scholarships for outstanding undergraduate majors. We welcome all students and invite them to participate in program activities. We have a diverse faculty and we actively promote diversity among our faculty, staff, and students.

GENV students need a solid mathematics background to prepare them for advanced-level courses. We strongly recommend that GENV majors fulfill the University Core Curriculum requirement by taking MATH 108, College Algebra.

Bachelor of Science (B.S.) in Geography and Environmental Resources Degree Requirements

Degree Requirements	Credit Hours
University Core Curriculum Requirements	39
Requirements for Major in Geography and Environmental Resources	42

Degree Requirements		Credit Hours
Geography and Environmental Resources Major Courses GEOG 300I, GEOG 303I, GEOG 401, GEOG 433, and GEOG 404 or GEOG 412		15
Two of the following: GEOG 100, GEOG 103, GEOG 104, GEOG 304, GEOG 310I, GEOG 320, or GEOG 330		6
Specialization (one of the following):		21
Environmental Geography and Sustainability Specialization: GEOG 320, GEOG 330, GEOG 424, GEOG 436, and GEOG 470; and two additional GEOG classes at the 400-level		or
Geographic Information Science (GIS) Specialization: GEOG 406, GEOG 408, GEOG 416, GEOG 420 and three additional GEOG classes at the 400-level		
Electives		39
Total		120

Geography and Environmental Resources Minor

A minor in geography and environmental resources consists of 15 credit hours from a combination of the core courses and any one of the specializations.

GIS Minor

The Undergraduate GIS Minor enables students to focus on the fundamentals of geospatial techniques and analytical skills. This minor meets the needs of the expanding job opportunities for undergraduate students. This minor ensures that students understand earth-map relationships; understand principles of cartography; know the technical aspects of remote sensing and have competence in visual interpretation and digital processing and analysis of imagery; understand the basic representation and modeling of spatial data in GIS. Further, they will demonstrate an understanding of GIS concepts, database management, and the process of decision-making in the GIS context and obtain yield basic skills of spatial analysis and modeling and the analytical capabilities of ESRI's ArcGIS and ERDAS IMAGINE. Finally, they will be competent in planning, developing, and implementing a major GIS project.

Course Requirement: The program requires students to complete 15 credit hours of undergraduate level coursework, selected from the following list: GEOG 310I, GEOG 401, GEOG 404, GEOG 406, GEOG 408, GEOG 416, GEOG 417, GEOG 420, GEOG 428, and GEOG 458.

Sustainability Minor

The Undergraduate Minor in Sustainability enables students to expand their knowledge and understanding of the long-term sustainability of the earth's resources, including water, land use and food systems, climate change, urban sustainability, and "green" energy. This minor meets the needs of the expanding job opportunities in environmental sustainability.

Course Requirement: Students must maintain a 2.7 GPA in the certification courses. The program requires students to complete at least 15 credit hours of coursework, as follows: GEOG 300I, GEOG 320,

and GEOG 424, and two of the following: GEOG 421, GEOG 422, GEOG 426, GEOG 429, GEOG 431, GEOG 435, GEOG 436, GEOG 439, GEOG 454, GEOG 480, GEOG 481.

Geography and Environmental Resources Honors Program

The Geography and Environmental Resources Honors Program is a program within the major that is designed to recognize the outstanding scholarship of our top students and reward them with additional challenging and stimulating course options. Participation in the GENV Honors Program is contingent upon a student's admission to the University Honors Program (UHP). The UHP requirements are found at: honors.siu.edu. Honors students in our major should meet with the program director to discuss their interests and determine their course schedules.

Honors courses in Geography and Environmental Resources are: open to GENV majors; have prerequisites as listed by course number in the next section below; and have special assignments as arranged with each instructor.

Technology Fee

The College of Agricultural, Life, and Physical Sciences assesses undergraduate majors a technology fee of \$4.58 per credit hour up to 12 credit hours. The fee is charged Fall and Spring semester.

Geography and Environmental Resources Courses

GEOG100 - Environmental Conservation (University Core Curriculum) Human activity has changed every place on planet Earth. This course explores how and where these changes take place, and practical ways people can interact with the environment in a more sustainable manner. Themes to be explored include: biodiversity, global climate change, human population growth, and sustainability of food, soil, and water resources. Through lectures, discussions, and field trips students will investigate and map patterns integral to understanding environmental conservation issues. Credit Hours: 3

GEOG103 - World Geography (University Core Curriculum) [IAI Course: S4 900N] Examination of the world's major geographic patterns, the diversity of environments, cultures and economic activities, differences between developing and developed nations, interdependence of nations and regions through communication and trade and in-depth assessment of representative environmental issues. Credit Hours: 3

GEOG104 - Weather, Climate, and Society (University Core Curriculum) A scientific introduction to the physical processes responsible for weather and climate and the application of fundamental scientific skills to address aspects of weather and climate that are of particular importance to society at large. Lab fee: \$20. Credit Hours: 3

GEOG204 - Environmental Justice (University Core Curriculum) Analyze case studies from around the world to demonstrate how environmental benefits and environmental problems are unfairly shared among different populations of people. Critical examination from geographic, historical, legal, social, physical, and political perspectives will focus on ways to identify and prevent breaches of environmental justice. Addressing environmental justice is critical to global sustainability and on development of a more inclusive and effective environmental movement. Topics covered in the course will reflect a variety of contemporary issues including environmental racism, indigenous rights, community activism, and climate justice. Credit Hours: 3

GEOG300I - Geography, People, and the Environment The goal of this course is to understand complex relationships between humans and the natural environment, using an interdisciplinary approach. Students will acquire knowledge to analyze and understand environmental issues from multiple perspectives grounded in the social sciences and humanities. Emphasis will be placed on understanding how different perspectives guide the assumptions, priorities and decisions that influence how we use, interact with and manage the natural environment. Key themes include 1) the complexity and

interconnections of human-environment systems; 2) the role of values and tradeoffs in decision-making; 3) the importance of interdisciplinary perspectives; 4) issues of collaboration, institution building, and policy development. Credit Hours: 3

GEOG303I - Physical Geography (University Core Curriculum) [IAI Course: P1 909L] This course provides students with an overview of the earth's physical and biogeographic systems. Emphasis is placed on 1) understanding the role of geomorphology, climate, and biogeography in the shaping of the Earth's environment and 2) development of skills related to observation and analysis of environmental processes. Lab Fee: \$20. Credit Hours: 3

GEOG304 - Environmental Justice Analyze case studies from around the world to demonstrate how environmental benefits and environmental problems are unfairly shared among different populations of people. Critical examination from geographic, historical, legal, social, physical, and political perspectives will focus on ways to identify and prevent breaches of environmental justice. Addressing environmental justice is critical to global sustainability and on development of a more inclusive and effective environmental movement. Topics covered in the course will reflect a variety of contemporary issues including environmental racism, indigenous rights, community activism, and climate justice. Credit Hours: 3

GEOG310I - Introduction to Geographic Information Systems (University Core Curriculum) An interdisciplinary course that provides students the skills and knowledge to use geospatial technologies such as geographic information systems (GIS), global positioning systems (GPS), and remote sensing. Applications drawn from diverse fields: environmental science, ecology, social sciences and others. Course includes lectures, discussions, interactive and hands-on computer exercises and projects. Lab fee: \$40. Credit Hours: 3

GEOG312 - Introduction to GPS, LiDAR, and Radar Applications This course provides the practical skills, knowledge, and understanding of quantitative measurement tools in the field of environmental and geospatial applications. The course focuses on the basic concepts and applications of GPS (Global Positioning System), LiDAR (Light Detection and Ranging), and Radar systems. Use of the GPS, a way of accurately determining positions on the earth has grown exponentially and is currently used in mapping, navigation, surveying, agriculture, construction, vehicle tracking and recovery, archaeology, biology, cell phones and automobiles. The course also introduces fundamental concepts of accuracy assessment and appropriate use of these data products. Students will also master the basic skills needed to leverage these data sources and information products in the context of application domains. Course component includes lectures, labs, and field work. Credit Hours: 3

GEOG320 - Introduction to Environmental Sustainability The course provides students with an introduction to the philosophy and tools of environmental sustainability, with an emphasis on the integration of the ecological, economic and social aspects of sustainability. The aim of the course is to provide students with practical examples of the methods used to design, implement and assess environmental sustainability at multiple management levels. The course examines issues and case studies with a local through global perspective. Prerequisites: None. Credit Hours: 3

GEOG330 - Physical Climatology Contemporary view of earth's climate system and its relevant processes from an advanced, physical perspective. Topics covered include energy balance, the hydrologic cycle, atmospheric and oceanic general circulation, interactions between the atmosphere, ocean, and land at a variety of spatial and temporal scales, and modeling and predicting these processes and interactions with appropriate models. Prerequisite: GEOG 104 with a grade of C or better, or consent of instructor. Credit Hours: 3

GEOG355 - Global Sustainability In this two-week study abroad course students will explore real-world sustainability topics while immersed in the fascinating history, rich culture and beautiful landscapes of different regions of the globe. We will study a range of diverse strategies for enhancing sustainability in urban, rural and remote settings across the region of focus with an emphasis on how principles of leadership, collaboration and policy-making can be applied to address complex and multifaceted sustainability challenges on the ground. The core structure of the course is field trips and site visits with accompanying lectures and guided tours. Credit Hours: 3

GEOG361 - Regional Geography of the United States A survey of environmental, economic, and historical factors and problems in the development of the United States and its regions. Analysis of

population trends, assessment of economic activities, and analysis of transportation networks from a geographic perspective are introduced. Some attention is given to the United States in the world economy. Credit Hours: 3

GEOG401 - Geographic Information Systems This course will prepare students with comprehensive working knowledge and technical skills related to geographic information systems (GIS). It covers important topics in the context of GIScience, including coordinate systems and georeferencing, data structures (vectors and rasters), map principles and design, spatial analysis and modeling, GPS, GIS data sources, and data uncertainty, which are critical to support the implementation of a GIS project. A series of GIS labs and a final class project will help equip students with necessary skills (e.g., mapping, spatial analysis, and geocoding) to fulfill the tasks of an entry-level GIS position. Undergraduate students are expected to apply basic levels of GIS skills to spatial problem solving and complete a term paper with references. GEOG 310I or FOR 308 is recommended before taking this course. Lab fee: \$40. Credit Hours: 3

GEOG404 - Spatial Analysis This spatial analysis course is an introduction to statistical methods for geographers. The course provides an overview of the application of spatial statistical theories, concepts and approaches in the general context of the emerging fields of geographic information system (GIS) and science (GISci). The main focus of this course is on how techniques for the analysis of spatial data can effectively be applied in a GIS environment, with a particular emphasis on the study of spatial patterns, distribution, and associations. Prerequisite: GEOG 401 with a grade of C or higher, or consent of instructor. Lab fee: \$40. Credit Hours: 3

GEOG406 - Introduction to Remote Sensing An introduction to the fundamentals of remote sensing as applied to environmental management. This course will examine the theoretical and practical aspects associated with the use and analysis of aerial photography and satellite imagery. These include how remote sensing data are acquired, displayed, analyzed and how information on our environment can be extracted from such data. Students will be introduced to manual interpretation and digital image processing techniques of remotely sensed imagery. Students will have the opportunity to gain hands-on experience using image processing software. Lab fee: \$60. Credit Hours: 3

GEOG408 - Advanced Remote Sensing Advanced techniques in the analysis of remotely sensed data. Emphasis is placed on digital image processing using state-of-the-art technology. Students will be expected to develop individual problem-driven projects that use the knowledge, tools and techniques that are developed in this course. Prerequisite: GEOG 406, with a grade of C or higher, or consent of instructor. Lab fee: \$60. Credit Hours: 3

GEOG412 - Applied Geographic Statistics Introduction to basic statistical methods and skills related to the application of statistics to problems in geography. Lectures are supplemented with practical exercises to stress the applied nature of statistics in environmental problem solving. Topics covered include descriptive statistics, time series, probability, point and interval estimation, hypothesis testing, correlation and regression, analysis of variance, and spatial statistics. Credit Hours: 3

GEOG413 - Research Methods for Environmental Social Science This course provides a foundation in social inquiry for environmental scientists. Topics include quantitative and qualitative social science research methods that can be applied to understand and identify solutions to complex socio-environmental issues. Research paradigms, research design, sampling frameworks, measurement, and the ethics of social research will be discussed. The course structure includes a combination of lectures, seminar-style discussions, and in-class activities. Credit Hours: 3

GEOG416 - Cartographic Design Introduction to the concepts and principles of map design and automated cartographic techniques used to promote the understanding of a map as a powerful communication model. Examines techniques for the representation, manipulation, display, and presentation of spatial data using computer mapping techniques and graphics software. Team based projects will address a geographic problem and produce a professional final map. Prerequisite: GEOG 401, with grade of C or higher, or consent of instructor. Lab fee: \$40. Credit Hours: 3

GEOG417 - GIS Programming and Customization GIS programming trains students in customizing GIS applications and streamlining spatial analysis by assembling functions provided by the underlying GIS platforms. This course is an introduction to programming and scripting for intermediate GIS users who need to automate the geoprocessing of GIS datasets. This course focuses the most popular

commercial platform, ArcGIS ModelBuilder and Python Scripting for ArcGIS. Through this course, students will understand the object-oriented programming principles, master the advanced skills of building a complex workflow for GIS analysis, and develop customized geoprocessing programs to edit, manipulate and analyze spatial data using ArcPy and Python. Undergraduate students are expected to apply basic programming skills for addressing spatial problems, and to present the results in the form of oral presentations and written reports. Prerequisite: GEOG 401 or GEOG 502, with grade of C or higher, or consent of instructor. Lab fee: \$40. Credit Hours: 3

GEOG419 - Enterprise GIS Planning and Implementation Students will gain both theoretical and practical understanding of the design process of enterprise GIS; be able to assess the scope of a system and address data and technology requirements of that system; become exposed to a host of the state-of-the-art tools and concepts in enterprise GIS; and learn skills for hardware, software and computer networking issues. Students are expected to have a basic working knowledge of ArcGIS and ArcIMS. Prerequisite: GEOG 401 or consent. Lab fee: \$20. Credit Hours: 3

GEOG420 - Advanced (GIS) Studies This course focuses on advanced conceptual and technical issues underlying GIS, including GIS data modeling, geodatabase model and structure, analytical methods and procedures associated with geospatial modeling, and the latest developments in geospatial sciences. Laboratory assignments include the analysis of digital geographic information of physical and social phenomena, emphasizing the use of standard GIS software to illustrate techniques of geodatabase, map digitization, spatial data exploration, spatial analysis/modeling, and GIS-based decision support. Undergraduate students will work as groups to design, implement and present GIS projects that leverage advanced GIS theories and techniques to solve spatial problems. Prerequisite: GEOG 401 or GEOG 502, with grade of C or higher, or consent of instructor. Lab fee: \$40. Credit Hours: 3

GEOG421 - Urban Sustainability Sustainability of urban areas is viewed from a geographical perspective to focus on the complex relationships among environmental, sociocultural, economic, and political phenomena. Students learn how to identify, analyze and explain urban problems and their sustainable solutions. Credit Hours: 3

GEOG422 - Environmental and Energy Economics Economics of renewable and nonrenewable natural resources management and environmental policy. Topics covered include: static and dynamic efficiency, market efficiency and market failures (market power, externalities and public goods), the economics of nonrenewable resource extraction, renewable resources management (with a focus on forests and water), mechanism design choices and their implementation in the real world, and the role of the private and public sectors in research and development. Credit Hours: 3

GEOG422H - Environmental and Energy Economics (University Honors Program) (Same as GEOG 422, GEOG 522) Economics of renewable and nonrenewable natural resources management and environmental policy. Topics covered include: static and dynamic efficiency, market efficiency and market failures (market power, externalities and public goods), the economics of nonrenewable resource extraction, renewable resources management (with a focus on forests and water), mechanism design choices and their implementation in the real world, and the role of the private and public sectors in research and development. Credit Hours: 3

GEOG424 - Sustainable Development Analysis of the human, economic, technological, environmental, and political dimensions of sustainable development focusing on public and private sector institutions that manage renewable and non-renewable natural resources. Emphasis is sustainable development as applied to: (a) population, (b) energy and the atmosphere, and (c) agricultural impacts on soil and water resources. Credit Hours: 3

GEOG424H - Sustainable Development (University Honors Program) Open to undergraduates. Available for Honors credit by special arrangement. Not for graduate credit. Credit Hours: 3

GEOG426 - US Environmental Policy This course investigates the US system of environmental regulation: the background of social and environmental movements that influence US policy and the agencies involved in US environmental regulation. Emphasis is on US regulations and US participation in global environmental policies. Overall, the focus is on spatial variations in environmental regulations; or the geography of environmental quality. Credit Hours: 3

GEOG428 - GIS Portfolio/GIS Capstone Project Independent development and implementation of a major GIS project based on analysis of spatially referenced data sets to produce digital products and to solve real world problems. Data obtained from multiple sources, including downloads from online sources, field-collected data, and published map data. A project portfolio and a poster approved by the instructor must be submitted for successful completion. Prerequisite: GEOG 401 and GEOG 406, with a grade of C or higher, or consent of instructor. Lab fee: \$20. Credit Hours: 3

GEOG429 - Geography of Local and Organic Food A discussion of geographic topics in local and organic food and farming. This includes: spatial distributions, landscapes, policy influences, organic agricultural productivity, food safety, consumer concerns, organic farmers' decision making, organic marketing, local food systems, and organic certification. Credit Hours: 3

GEOG430 - Environmental Systems Analysis Exploration of the major environmental systems relevant to planning. Topics include concepts of systems and system behavior; basics of systems analysis and modeling environmental systems; environmental fluxes of energy and materials (e.g., hydrologic cycle, carbon cycle, energy budgets, erosion and sediment transport, role of biosphere in organizing fluxes); environmental variability. Credit Hours: 3

GEOG431 - Climate Data and Analysis This course focuses on identifying, locating, and applying appropriate climate data sets (e.g., station observations, atmospheric reanalyses, and climate model output), techniques for obtaining and processing these data sets, and methods commonly used for applied climate analysis. Student-lead, applied research projects provide students with the opportunity to utilize a variety of data sets and analytical tools introduced during the semester. The curriculum is organized around current practical problems from a variety of disciplines and identifying and analyzing appropriate data sets to address them. Students will become familiar with a range of computational packages, including Excel, SPSS, and Matlab. Students should have a basic understanding of climatology and statistics prior to taking this class. Prerequisite: GEOG 330, with a grade of C or higher, or consent of instructor. Credit Hours: 3

GEOG431H - Climate Data and Analysis (University Honors Program) Open to undergraduates. Available for Honors credit by special arrangement. Prerequisite: GEOG 330, with a grade of C or higher, or consent of instructor. Credit Hours: 3

GEOG433 - Field Methods in Geography Quality geographic research depends on obtaining reliable data through an informed research design. Exploring both social and environmental processes, students will actively participate in developing and conducting investigations. Using the SIU Carbondale campus and surrounding region as a laboratory, lab exercises will include human geography, geomorphology, climatology and biogeography. Analytical techniques will include introductory statistics and mapping. Prerequisite: GEOG 303I with a minimum grade of C. Not for graduate credit. Restricted to 3rd Year and 4th Year majors in Geography and Environmental Resources or consent of instructor. Lab fee: \$40. Credit Hours: 3

GEOG433H - Field Methods in Geography (University Honors Program) Open to undergraduates. Available for Honors credit by special arrangement. Prerequisite: GEOG 303I with a minimum grade of C. Restricted to 3rd Year and 4th Year majors in Geography and Environmental Resources or consent of instructor. Credit Hours: 3

GEOG434 - Water Resources Hydrology This course covers the major components of the hydrologic cycle with emphasis on surface water and fluvial (stream) processes. Students will gain a detailed understanding of the major hydrologic processes and develop substantial experience in collecting, compiling, and analyzing hydrologic data for use in water resource analysis and management. Lab fee: \$20. Credit Hours: 3

GEOG435 - Energy Planning Regional and national differences in energy supply and demand are reviewed followed by a study of current energy resources, the range of demands and environmental impacts. National and international planning strategies for dealing with changes in energy demand and supply are explored and assessed for present and future implementation probability. Credit Hours: 3

GEOG436 - Natural Hazards This course introduces students to the geophysical and human dimension of natural hazards and focuses on five main areas: 1) characterization of natural hazards; 2) human dimensions of natural hazards; 3) natural hazard risk assessment; 4) natural hazard mitigation planning;

5) the use of geospatial tools and models used in risk assessments and mitigation planning activities. Students will develop a fundamental understanding of both geophysical and human dimensions of natural hazards and an awareness of how natural hazards can develop into disasters. Lab fee: \$20. Credit Hours: 3

GEOG439 - Global Climate Change This course examines environmental, social, and policy issues relevant to global climate change, including anthropogenic drivers of contemporary climate change, environmental pollution, greenhouse gas emissions, and land use/land cover change. Climate change impacts and solutions are discussed and may include renewable energy, climate hazards, environmental policy, global agreements, climate refugees, climate justice, and human health. Credit Hours: 3

GEOG439H - Global Climate Change (University Honors Program) Open to undergraduates. Available for Honors credit by special arrangement. Credit Hours: 3

GEOG440 - Introduction to Rivers and Their Management In this class, students will be introduced to the principles and concepts from physical, environmental, and social sciences to develop a foundational understanding of the linkages between physical river processes and the services rivers provide to society. The topics covered in this course include river hydrology, fluvial geomorphology, river management and human impacts on rivers and their ecosystems. Students will also gain substantial experience in collecting, compiling, and analyzing hydrologic, sedimentological, and hydraulic data for use in quantitative analysis and management. Prerequisite: GEOG 303I with a grade of C or better. Lab fee: \$20. Credit Hours: 3

GEOG444 - Soils and Human Health Exploration of the ways that soils, and to a lesser extent air and water, influence human health both positively and negatively. Soil properties and processes that control this interaction. Techniques used to explore the soil-human health relationship and needs for future advancement. Prerequisite: CSEM 240 or GEOG 303I or FOR 352 with a grade of C or better. Credit Hours: 3

GEOG452 - Environment and Population Introduction to population geography. Emphasis is on the relationships between population trends, resource use patterns and environmental impacts. Topics include methods and data used to describe and predict populations, theories of population and policy issues that relate to the interaction between population, quality of life and environmental quality. Prerequisite: GEOG 320 or consent of instructor. Credit Hours: 3

GEOG454 - Conservation and Environmental Movements Emphasizes the ways in which humans view and interact with the environment. Conservation literature and the works of influential environmentalists are studied. Specific theories and environmental movements which help to explain society's current perception and use of the environment are studied. Credit Hours: 3

GEOG455 - Environmental Behavior Change This course will cover foundational psychological principles and theories related to how people think about, feel about, relate to and experience the natural environment. Students will learn how these theories and principles can be applied to change behavior and encourage environmental sustainability. Throughout the semester, students will practice drawing upon their theoretical knowledge to design behavioral interventions and communication strategies of their own. Students will also learn to read, understand, evaluate and critique peer-reviewed psychological research papers. Readings will be drawn from several areas of psychology, including behavioral, social, cognitive and experimental psychology. The course structure includes a combination of lectures, seminar-style discussions, and in-class activities. Credit Hours: 3

GEOG456 - Geographic Visualization This course will provide an overview of geographic visualization with a concentration on the theories, concepts and approaches of information visualization. Lectures and laboratory exercises will focus on the practical issues of exploratory data analysis (EDA), cartographic design process, web cartography, data quality and generalization, thematic mapping, map animation and multimedia applications. The course will provide students with a working knowledge of commercial software commonly used for graphic-based applications. Students are expected to utilize the hands-on experience gained from the lab exercises to further enhance their proficiency in graphic software. Two hours of seminar and classroom presentations, two hours of studio exercises each week. Lab fee: \$30. Credit Hours: 3

GEOG457 - American Environmental History (Same as HIST 457) An exploration of the attitudes toward and the interaction with the natural resource environment of North America by human settlers. Coverage from the Neolithic Revolution to the present. Credit Hours: 3

GEOG458 - Applied GIS This course provides practical GIS applications and draws from special topics in data visualization and environmental applications. The topic on data visualization includes an overview of techniques for visualizing large-scale datasets and is inspired by concepts from information visualization. Topics in environmental applications consist of risk assessment, digital elevation model processing, and watershed delineation and hydrological modeling. Students taking this course will distinctively learn: (1) how to visualize geographic data; (2) how to use different environmental risk assessment methods; (3) how to assess, detect, and characterize environmental risks and potential threats; and (4) how to create meaningful visualization scenes to support environmental decision-making. Active learning experiences will be achieved through the use of classroom lectures, lab exercises, group tasks, and presentations. Prerequisite: GEOG 401 or GEOG 310I or consent of instructor. Lab fee: \$20. Credit Hours: 3

GEOG465 - Introduction to Energy Geography This course explores energy as a critical geographic and social phenomenon, emphasizing the spatial and temporal dimensions of energy distribution, availability, accessibility, and acceptability. Students will (1) understand energies beyond disciplinary technical and engineering domains but from interdisciplinary geographic perspectives, and (2) examine the interplay between energy and place, as well as the relationships between energy and people. The course covers both physical and social perspectives, offering a comprehensive understanding of the complexities of energy systems, their role in economic development, environmental sustainability, and community resilience. Prerequisite: GEOG 310I or GEOG 401 with a grade of C or better. Credit Hours: 3

GEOG470 - Contemporary Issues in Environmental Studies Background, current, and future issues linking social responses to scientifically relevant environmental issues. Students learn about the multiple geographic, social and ecological factors that influence environmental citizenship and participation. Topics may include climate change, conservation/preservation, green jobs, environmental non-governmental organizations, policy influences, sustainable lifestyles, plastics pollution, and environmental education. Credit Hours: 3

GEOG471 - Environmental Impact Analysis Techniques of assessing the impact of human activities on the environment, including weighting schemes, cost-benefit analysis, linear programming, ecological impact assessment. Emphasis is on placing NEPA and EIS writing in legal, economic, and environmental perspective. Credit Hours: 3

GEOG480 - Internship in Geography Supervised field work in private or public organization dealing with environmental sustainability or GIS. A report or professional poster on the work is required at the end of the semester. Courses may be repeated, but no more than 3 credit hours of either 480 or 481 may be applied to an undergraduate major or graduate degree. Restricted to students majoring in Geography and Environmental Resources or minoring in Environmental Studies. Special approval needed from the program. Credit Hours: 2-6

GEOG480H - Internship in Geography (University Honors Program) Open to undergraduates. Available for Honors credit by special arrangement. Restricted to Geography major or consent. Credit Hours: 3-6

GEOG481 - Cooperative Work Experience in Geography Placement of advanced undergraduate or graduate student in private or public organization for one or more semesters in paid career-related position identified by student. Student gains professional experience, under faculty and on-site supervision. A report or professional poster on the work is required at the end of the semester. Three credit hours of either 480 or 481 may apply toward requirements for a Geography undergraduate major or graduate degree. Restricted to students majoring in Geography and Environmental Resources or minoring in Environmental Studies. Special approval needed from the program. Credit Hours: 3-12

GEOG487A - Honors in Geography-Honors Tutorial Must be spread over the last two years of the undergraduate's career. May be taken in either A, B, C, or B, A, C sequence. Special approval needed from the program. Credit Hours: 1

GEOG487B - Honors in Geography-Honors Reading Must be spread over the last two years of the undergraduate's career. May be taken in either A, B, C, or B, A, C sequence. Special approval needed from the program. Credit Hours: 2

GEOG487C - Honors in Geography-Honors Supervised Research Must be spread over the last two years of the undergraduate's career. May be taken in either A, B, C or B, A, C sequence. Prerequisite: GEOG 487A & B or consent of program. Credit Hours: 3

GEOG490 - Readings in Geography Supervised readings in selected subjects. Restricted to geography majors. Credit Hours: 2-4

Geography and Environmental Resources Faculty

Duram, Leslie A., Professor, Geography and Environmental Resources, Ph.D., University of Colorado, 1994; 1994. Environmental geography, local food systems, climate change and society, campus sustainability.

Hurst, Kristin, Assistant Professor, Geography and Environmental Resources, Ph.D., Virginia Polytechnic Institute and State University, 2019; 2021. Sustainability psychology, pro-environmental behavior, climate change engagement, and human-environment interaction.

Li, Ruopu, Associate Professor, Geography and Environmental Resources, Ph.D., University of Nebraska, 2012; 2015. GIS analysis and modeling, water resources modeling and management, energy geography, agricultural land use.

Remo, Jonathan, Associate Professor, Geography and Environmental Resources, Ph.D., Southern Illinois University, 2008; 2012. Fluvial geomorphology, flood hydrology, hydraulic modeling, disaster mitigation planning, disaster loss modeling.

Schoof, Justin, Professor and Director School of Earth Systems and Sustainability, Geography and Environmental Resources, Ph.D., Indiana University, 2004; 2006. Climate variability and change, synoptic climatology, statistical climatology, climate extremes.

Wagner, Audrey, Lecturer, Geography and Environmental Resources, M.S., Southern Illinois University, 2009; 2011. Online education, instructional design.

Wang, Guangxing, Professor, Geography and Environmental Resources, Ph.D., University of Helsinki, 1996; 2007. Remote sensing, GIS, forest and city carbon modeling and mapping, spatial uncertainty analysis of remote sensing products.

Weinert, Julie, Professor of Practice, Ph.D., The Ohio State University, 2008; 2005. Tourism geography, ecotourism, feminist geography, globalization, geography of development.

Emeriti Faculty

Baumann, Duane D., Professor, Emeritus, Ph.D., Clark University, 1968

Dziegielewski, Benedykt, Professor, Emeritus, Ph.D., Southern Illinois University, 1983.

Horsley, Doc, Assistant Professor, Emeritus, Ph.D., Southern Illinois University, 1974.

Lieber, Stanley R., Professor, Emeritus, Ph.D., University of Iowa, 1974.

Sharpe, David M., Professor, Emeritus, Ph.D., Southern Illinois University, 1968.

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