

# GEOG-GEOGRAPHY

## **GEOG 1103 Human Geography 3 Credit Hours**

An introduction to the humanized Earth; specifically, to the geography of population, the global pattern of cultures and such affiliated elements as language, religion, technology, and political organization, and to the physical expression of those cultures in rural and urban settings. (F, Sp, Su) [IV-WC].

## **GEOG 1113 The Language of Maps 3 Credit Hours**

Introduction to reading, analyzing and interpreting graphic information symbolized on a wide variety of maps. Topics include: scale, projection, generalization, symbolization, statistical map techniques, coordinate systems, interpreting human and physical landscapes on topographic maps and web-based mapping services, controversies about place names, political gerrymandering, and cartographic innovations. (Sp) [I-O].

## **GEOG 1114 Physical Geography 4 Credit Hours**

A systematic introduction to the physical Earth; including Earth materials, landform processes and resultant landforms, Earth-sun relations, weather, climate, the water cycle, natural vegetation, and soil types. Emphasis is placed on the inter-relationships among these phenomena. (F, Sp, Su) [II-NSL].

## **GEOG 1123 Introduction to Geohumanities 3 Credit Hours**

Introduces students to the link between geography and the humanities, specifically the way we imagine, design, understand and represent the lands and lives of everyday places. Students learn how others have used words (e.g., literature, stories, blogs), pictures (e.g., art, photography, television, video, cinema), music, and maps to assign meaning to places. (F, Sp)

## **GEOG 1203 Global Environmental Issues 3 Credit Hours**

This course is an "interactive" lecture/discussion course, and integrates environmental content with selected readings, hosts guest experts and connects students with real world applications. The myriad of environmental issues and concepts expressed by various media that impact us directly and indirectly will be academically explored. (F, Sp) [III-SS].

## **GEOG 1213 Economic Geography 3 Credit Hours**

A survey of the contemporary global economy and of the analytical approaches developed by geographers studying it. Economic systems are examined at the household, urban, regional, national, and international levels. Special attention is given to changes in resource use, regional specialization, trade, industrial and retail location, and modernization. (F, Sp) [III-SS].

## **GEOG 2021 Exploring DGES 1 Credit Hour**

Prerequisite: Majors only. An immersive course designed to introduce students to The Department of Geography & Environmental Sustainability (DGES). Students investigate and practice what it means to be an environmental sustainability, geographic information science, or geography major. Provides foundational knowledge for researching, designing, and implementing each student's DGES degree for a successful collegiate experience and create a sense of belonging and community. (F)

## **GEOG 2603 World Regional Geography 3 Credit Hours**

A broad survey of the world's major culture regions emphasizing basic physical, cultural, economic, and political patterns, as well as the processes that have created those patterns. Emphasis on economic development, ethnic conflict, and environmental degradation, as well as on the changing role of the United States. (F, Sp, Su) [IV-WC].

## **GEOG 2970 Special Topics/Seminar 1-3 Credit Hours**

Special Topics. 1 to 3 hours. May be repeated; Maximum credit nine hours. Special topics course for content not currently offered in regularly scheduled courses. May include library and/or laboratory research, and field projects. (Irreg.)

## **GEOG 3003 Interpreting Planet Earth 3 Credit Hours**

Prerequisite: junior standing or permission of instructor. This one semester, dynamic course integrates human and physical geography. Understanding our planet, its people, issues and global activities will involve "hot topic" discussions, case studies, a team project, plus two outside class field-based activities. (Sp) [III-SS].

## **GEOG 3023 Principles of Physical Geography 3 Credit Hours**

Prerequisite: junior standing or permission of instructor. This course is designed to explain important physical geographical processes and phenomena, the interactions among these phenomena, and their relationship with various human activities. The course provides a solid foundation for upper level physical geography courses including biogeography, climatology, geomorphology, and hydrology. (Sp)

## **GEOG 3043 Living With Nature 3 Credit Hours**

Prerequisite: Junior standing or department permission. Examine the forces of nature that cause disruptions and disasters which includes the process that produces storms, hurricanes, wildfires, droughts, etc. Each topic will include an examination of the causes of those events, where and how often they occur, and the risks they pose to people and society and what actions are needed to reduce or prevent impacts. (Sp) [II-NS].

## **GEOG 3133 Geography of Beer, Wine and Spirits 3 Credit Hours**

Prerequisite: junior standing; students must be 21 years of age or older as of the first day of the semester; permission of department; Student must e-mail instructor for permission to enroll. This course introduces you to the cultural and historical landscapes that made/make beer, wine, and spirits possible. The course is a rapid introduction to help bring an appreciation to these these industries. Analysis of physical and cultural forces which shape the production, consumption and variety of these beverages. (F, Sp)

## **GEOG 3213 Principles of Human Geography 3 Credit Hours**

Prerequisite: upper-division standing or permission of instructor. Introduction to the distribution of humans and their activities on the surface of the earth and the processes that generate these distributions. Special attention given to the influence of economy, culture, and politics in shaping the land and the spatial character and organization of human life. A key theme is the relationship of human diversity and places to the environment. (F)

## **GEOG 3233 Principles of Sustainability 3 Credit Hours**

Prerequisite: junior standing or permission of instructor. Provides a broad introduction to the basic principles of sustainable development with an examination of its social, economic, and environmental dimensions. Students will learn about sustainability strategies and practices from a national and international perspective with attention paid to the ethical and cultural aspects integral to a transition to sustainability. (F)

## **GEOG 3243 Principles of Economic Geography 3 Credit Hours**

Prerequisite: junior standing or permission of instructor. An examination of the distribution of economic activities and the processes that generate them. Special attention is given to principles of economic location and their application to patterns of production, consumption, and exchange. Contemporary approaches to economic geography are critiqued, including relational economic geography, the creative economy, and environmental economic geography. (Sp)

- GEOG 3253 Environmental Conservation 3 Credit Hours**  
Contemporary environmental issues and policies. Problems of population growth, food production, energy shortages, resource depletion and pollution impacts will be stressed. The social aspects of conservation management policies will be viewed at both global and national scales. (F) [III-SS].
- GEOG 3440 Mentored Research Experience 3 Credit Hours**  
0 to 3 hours. Prerequisites: ENGL 1113 or equivalent, and permission of instructor. May be repeated; maximum credit 12 hours. For the inquisitive student to apply the scholarly processes of the discipline to a research or creative project under the mentorship of a faculty member. Student and instructor should complete an Undergraduate Research & Creative Projects (URCP) Mentoring Agreement and file it with the URCP office. Not for honors credit. (F, Sp, Su)
- GEOG 3443 Environment and Society 3 Credit Hours**  
Prerequisite: junior standing or permission of instructor. An introduction to the political, economic, and cultural factors that shape human-environmental relations around the world. Special attention is placed on how societies come to value the environment differently, how people struggle over access to and control of natural resources, and the social causes and consequences of environmental change. (F) [III-SS].
- GEOG 3513 Political Geography 3 Credit Hours**  
Prerequisite: junior standing. A survey, stressing current geopolitical conflicts. Special topics include the nation-state, territoriality, the legacies of colonialism, spheres of political influence, regional conflicts, and geopolitics in such areas as Europe and the Pacific Rim, demographic and resource considerations in world politics, and emerging culturally based conflicts. (F, Sp, Su) [IV-WC].
- GEOG 3523 Managing for a Changing Climate 3 Credit Hours**  
(Crosslisted with METR 3523) Prerequisite: Junior or Senior standing. Provides an integrative understanding of the components of the climate system including the range of natural climate variability and external drivers of climate change, in addition to impacts of a changing climate on multiple sectors such as the economy, policy, ecosystems, and indigenous populations. (F) [II-NS].
- GEOG 3773 Geography of the United States 3 Credit Hours**  
Prerequisite: Junior standing or permission of instructor. An introduction to the regional character of the United States, including its physical, social, and economic elements. (Irreg.)
- GEOG 3843 Gender and Environment 3 Credit Hours**  
Prerequisite: junior standing or permission of instructor. Critically examines the concepts of environment and gender. Particular emphasis is placed on how and why environmental inquiry and academic advocacy intersect. Students will study the organizational practices, institutional policies, and cultural politics with which the concepts of gender and environment are composed, conveyed, and contested. (Sp) [III-SS].
- GEOG 3890 Selected Studies in Geography 3 Credit Hours**  
1 to 3 hours. Prerequisite: junior standing. May be repeated with change of subject matter; maximum credit nine hours. To be used for special intersession courses and occasional (irregularly scheduled) courses of special concern and use for the undergraduate. (F, Sp)
- GEOG 3923 Quantitative Methods 3 Credit Hours**  
Prerequisite: junior standing and completion of a lower division general education math requirement. Introduces students to methods of collecting, organizing, and describing data, focusing specifically on environmental and geographical applications. Students also learn basic concepts of probability and statistical inference. The overall objective is to develop an understanding of statistical literacy as it is applied to geographical and sustainability related issues. (F, Sp)
- GEOG 3930 Field Techniques for Geographers 1-4 Credit Hours**  
1 to 4 hours. Prerequisite: twelve hours of geography or permission of instructor. May be repeated with change of subject matter; maximum credit six hours. Basic methods of data acquisition: surveying, measuring, sampling, sketching, and mapping. Individual and group projects may be required. (Irreg.)
- GEOG 3960 Honors Reading 1-3 Credit Hours**  
1 to 3 hours. Prerequisite: admission to Honors Program. May be repeated; maximum credit six hours. Consists of topics designated by the instructor in keeping with the student's major program. Covers materials not usually presented in the regular courses. (F, Su)
- GEOG 3970 Honors Seminar 1-3 Credit Hours**  
1 to 3 hours. Prerequisite: admission to Honors Program. May be repeated; maximum credit six hours. The projects covered will vary. Deals with concepts not usually presented in regular coursework. (Irreg.)
- GEOG 3980 Honors Research 1-3 Credit Hours**  
1 to 3 hours. Prerequisite: admission to Honors Program. May be repeated; maximum credit six hours. Provides an opportunity for the gifted Honors candidate to work at a special project in the student's field. (F, Sp, Su)
- GEOG 3990 Independent Study 1-3 Credit Hours**  
1 to 3 hours. Prerequisite: permission of instructor and junior standing. May be repeated once with change of content. Independent study may be arranged to study a subject not available through regular course offerings. (F, Sp, Su)
- GEOG 4003 The Global City and Planning Issues 3 Credit Hours**  
(Crosslisted with RCPL 4003; Slashlisted with 5003) Prerequisite: English 1213 and junior standing. An introduction to the concept of globalization and its effects on cities, and the city planning issues related to those effects. Characteristics, theories, and strategies of city development are reviewed. Cities are observed from several perspectives: natural and built environment, governance, society, economics, and history. No student may earn credit for both 4003 and 5003. (Sp)
- GEOG 4023 Geography of Health and Disease 3 Credit Hours**  
(Slashlisted with GEOG 5023) Prerequisite: Junior standing or department permission. This course offers a holistic view on "one health" by linking health and disease outcomes to the socio-cultural and physical environment, and the places that generate them. Lectures and discussion/lab sections will focus on basic concepts, principles, and methodologies in health studies, landscape epidemiology, global health under changing climate and environment, health disparities, healthcare and medical service planning. No student may earn credit for both 4023 and 5023.

- GEOG 4033 Human Impact on the Earth 3 Credit Hours**  
(Slashlisted with GEOG 5033) Prerequisite: Junior Standing. The earth has been radically transformed by human action. This course explores the human-induced "why" and the extent of global environmental change. The need to explain, predict and prevent such change led to the development of transdisciplinary approaches examining complex human-environmental relationships. Course discusses the current, international global environmental science research agendas within the context of social and environmental justice. No student may earn credit for both 4033 and 5033. (Sp)
- GEOG 4043 Urban Climatology 3 Credit Hours**  
(Slashlisted with GEOG 5043; Crosslisted with METR 4043) Prerequisite: Junior standing or departmental permission. This course provides an overview of urban climates based on a synthesis of modern scientific and applied research findings. The course covers a broad spectrum of topics such as urban airflow, radiation exchanges, urban energy balance, urban heat island, urban surface hydrology, air pollution, cities under global climate change, biometeorology, and sustainable urban design and planning. No student may earn credit for both 4043 and 5043. (Sp)
- GEOG 4123 Cities and Society 3 Credit Hours**  
(Slashlisted with GEOG 5123) Prerequisite: Junior standing or permission of instructor. The course introduces students to the geography of cities--history of cities in human society, connections between urban policies and social outcomes, challenges in constructing a city that works for all. Key concepts include city planning, industrialization, housing, transportation, social/racial/environmental justice, gentrification, and the future of cities. No student may earn credit for both 4123 and 5123. (F)
- GEOG 4183 Patterns and Processes in Landscape Ecology 3 Credit Hours**  
(Slashlisted with GEOG 5183) Prerequisite: Junior standing. This course will identify and evaluate the central constructs and methods of landscape ecology, focusing on the role of humans in creating and affecting landscape patterns and processes. Topics covered include fundamentals/frameworks of landscape ecology; how spatial patterns influence ecosystem, management, and conservation; how to quantify spatial pattern; and how to identify general drivers of landscape pattern. No student may earn credit for both 4183 and 5183. (F)
- GEOG 4200 Internship in Geography 1-6 Credit Hours**  
1 to 6 hours. Prerequisite: Permission of instructor and junior standing. May be repeated; maximum credit 6 hours. A student must secure their own internship that provides career training experience whereby students may apply geographical or environmental skills and develop further professional capabilities in a realistic setting. Students must complete internship hours and reflective coursework provided by faculty member to obtain credit. (F, Sp, Su)
- GEOG 4273 Regional Climatology 3 Credit Hours**  
(Slashlisted with GEOG 5273) Prerequisite: junior standing or permission of instructor. Investigates the nature of the Earth's climate and provides an examination of ideas about atmospheric circulation. Topics include radiation, the hydrologic cycle, general circulation, local and regional climates, and global climate change. Specific attention is focused on the climatic water budget, its utility in evaluating local and regional climates, the role of climate models, and issues in applied climatology. No student may earn credit for both 4273 and 5273. (Irreg.) [II-NS].
- GEOG 4283 Biogeography 3 Credit Hours**  
(Slashlisted with GEOG 5283) Prerequisite: junior or senior standing. Biogeography is the study of the spatial distribution, past and present, of plant and animal species and biodiversity. Course topics include factors affecting the distribution of species, the role of biogeography in biological conservation and understanding a changing world. No student may earn credit for both 4283 and 5283. (F)
- GEOG 4293 Hydrologic Science 3 Credit Hours**  
(Slashlisted with GEOG 5293) Prerequisite: Math 1823 or 1914 and either Physics 2414, 2514 or Chemistry 1315. Study of the processes which control the storage and movement of water at global, regional, and local scales. The emphasis is on the land portion of the hydrologic cycle, and includes the study of processes such as infiltration, soil water flow in the saturated and unsaturated zone, rainfall/runoff and evaporation. Lab sections include exercises on a computer in the field and in a soils lab. No student may earn credit for both 4293 and 5293. (Sp)
- GEOG 4313 Interpreting Society and Environment: Qualitative Research Methods 3 Credit Hours**  
(Slashlisted with GEOG 5313) Prerequisites: junior standing. This class approaches qualitative research methods from the perspective of human geography. That makes it especially useful for students who want to investigate the intersections of social and environmental relationships: be they historical, contemporary, or future (as in planning). No student may earn credit for both 4313 and 5313. (F)
- GEOG 4333 Corporate Environmental Strategy 3 Credit Hours**  
(Slashlisted with GEOG 5333) Prerequisite: junior standing or permission of instructor. Examination of the importance of environmental science and technology for corporations seeking sustainability. Students attain an understanding of the private sector as a force for positive environmental change and the dimensions of the natural environment in the competitive market. Corporate case students are discussed to improve understanding of strategic decision making. No student may earn credit for both 4333 and 5333. (Sp)
- GEOG 4343 Climate, History, and Society 3 Credit Hours**  
(Slashlisted with GEOG 5343) Prerequisite: junior standing or permission of instructor. This course is an overview of the mutual interactions of climate and human activities, and examines historical examples of significant climatic impacts. The course includes investigation of the nature of earth's climate and a synthesis of contemporary scientific ideas about the climate and its environmental and societal impacts. No student may earn credit for both 4343 and 5343. (Irreg.) [II-NS].
- GEOG 4423 Environmental Justice 3 Credit Hours**  
(Slashlisted with GEOG 5423) Prerequisite: Junior standing. This course will cover environmental injustices related to environmental hazards (e.g., air and water pollution, toxic and hazardous waste, industrial byproducts) as well as injustices related to environmental benefits (e.g., access to parks, greenery, and clean environments). Throughout the course, we will engage with environmental racism. No student may earn credit for both 4423 and 5423. (Sp) [III-SS].
- GEOG 4513 Real-world Applications of Climate and Weather Information 3 Credit Hours**  
(Slashlisted with GEOG 5513) Prerequisite: MATH 1823 and PHYS 2514. The purpose of this class is to broaden the perspective of students to the use of climate information in agriculture, energy, water resources, public health, and other areas of society. Field trip. No student may earn credit for both 4513 and 5513. (Sp)

- GEOG 4523 Life Cycle Analysis 3 Credit Hours**  
(Slashlisted with GEOG 5523) Prerequisite: junior standing or permission of instructor. This course provides students with an understanding of Life Cycle Analysis both with respect to its conceptual foundations as well as its applications across a variety of socially important sectors. No student may earn credit for both 4523 and 5523. (Sp)
- GEOG 4563 American Indian Geographies 3 Credit Hours**  
Prerequisite: upper-division standing. A survey of the geographical knowledge among Indians in North America. Historical and contemporary topics are covered in a cross-cultural perspective including land use, environmental perception, concepts of space and place, symbolic landscapes, sacred land, and the idea of resources. (Sp) [IV-WDC].
- GEOG 4583 Energy Systems and Sustainability 3 Credit Hours**  
(Slashlisted with GEOG 5583) Prerequisite: Junior standing or permission of instructor. An understanding of interdisciplinary elements and perspectives associated with energy systems in the context of sustainability. It examines current and future energy supply, transmission, and demand management options. A critical focus on the economic, social, and environmental implications of energy system transitions will help identify energy technology and infrastructure solutions while understanding the institutional and organizational changes necessary for implementation. No student may earn credit for both 4583 and 5583. (F)
- GEOG 4653 Urban Sustainability: Nature, Justice, and the City 3 Credit Hours**  
(Slashlisted with GEOG 5653) Prerequisite: Sophomore standing and ENGL/EXPO 1213, or instructor permission. This course explores the sustainability challenges our cities face and how we might address them from critical perspectives in urban studies, planning, and geography. Through guest speakers, films, field trips and reading discussions, we will learn about the historical, multi-spatial, political, and representational dimensions of urban sustainability, and analyze the implications of different approaches to urban sustainability. No student may earn credit for both 4653 and 5653. (F)
- GEOG 4663 Water and Society 3 Credit Hours**  
(Slashlisted with GEOG 5663) Prerequisite: Sophomore standing and ENGL/EXPO 1213, or instructor permission. To examine assumptions and understanding of the accessibility, quality, and distribution of water, the forces driving social change related to water, and the likely course of water and society issues in the future. A major objective is to challenge students to critically think about policy, and how we might develop effective, equitable, and just water policy for the 21st Century. No student may earn credit for both 4663 and 5663. (F)
- GEOG 4713 Dynamic Modeling of Socio-Environmental Systems 3 Credit Hours**  
(Slashlisted with GEOG 5713) Prerequisite: Senior standing or permission of instructor. This course is an overview of the use of modeling and simulation to document, analyze, and project the dynamic behavior of socio-environmental systems. The course covers an introduction of basic modeling and simulation terminology and three different approaches to modeling temporal and/or spatial dynamics: system dynamics modeling, agent-based modeling, and cellular automata. No student may earn credit for both 4713 and 5713. (Sp)
- GEOG 4753 Transportation Geography and Planning 3 Credit Hours**  
(Slashlisted with GEOG 5753; Crosslisted with RCPL 4753) Prerequisite: Junior standing. This course is intended to introduce students to the world of transportation planning and geography by explaining the importance of transportation from local to global and by engaging them in everyday transportation activities. Topics include, but not limited to, the history of transportation, the relationships between transportation and geography, transportation managements and policies, and urban transportation systems. No student may earn credit for both 4753 and 5753. (Sp)
- GEOG 4863 Regional Geographies of Indigenous Media 3 Credit Hours**  
(Slashlisted with GEOG 5863) Prerequisite: junior standing. Learn about the making, moving, and meanings of Indigenous media. Regional case studies feature scholarly readings that examine the geographically- and culturally-specific contexts from which particular forms of Indigenous media emerge. Ample video viewings allow us to explore the contents of media made by Indigenous artists/activists/intellectuals and their allies who live and/or work in a particular region. No student may earn credit for both 4863 and 5863. (Irreg.) [IV-WDC].
- GEOG 4893 Research and Professional Development 3 Credit Hours**  
Prerequisite: GIS 2023; GEOG 3923 or concurrent enrollment; senior standing; departmental permission. Synthesize and integrate students' previous course experiences through literature review, professional practices and discussion to create a capstone proposal. Students complete their proposals for research to be undertaken in the subsequent capstone course, GEOG 4953. The course will include professional development e.g resume writing, presentation, and interviewing skills. (F, Sp)
- GEOG 4943 Natural Hazards 3 Credit Hours**  
(Slashlisted with GEOG 5943) Prerequisite: junior or senior standing. Examines changes in patterns of a range of natural hazards and the impact they have on society. Examines general concepts of hazard mitigation and design and our perceptions of risk and how that affects preparedness and mitigation decisions. No student may earn credit for both 4943 and 5943. (F) [III-SS].
- GEOG 4953 Capstone 3 Credit Hours**  
Prerequisite: Department permission and GEOG 3924, GIS 2023, and C or better in GEOG 4893. Completion of research as proposed in GEOG 4893, including a formal presentation of results to faculty and students in the department and submission of a final research report reflecting a culminating experience in the student's degree program. (Sp) [V].
- GEOG 4960 Directed Readings 1-4 Credit Hours**  
1 to 4 hours. Prerequisite: good standing in University; permission of instructor and dean. May be repeated; maximum credit four hours. Designed for upper-division students who need opportunity to study a specific problem in greater depth than formal course content permits. (Irreg.)
- GEOG 4970 Special Topics/Seminar 1-3 Credit Hours**  
1 to 3 hours. Prerequisite: Senior standing or permission of instructor. May be repeated; maximum credit nine hours. Special topics or seminar course for content not currently offered in regularly scheduled courses. May include library and/or laboratory research and field projects. (Irreg.)
- GEOG 4990 Independent Study 1-3 Credit Hours**  
1 to 3 hours. Prerequisite: three courses in general area to be studied; permission of instructor and department. May be repeated; maximum credit six hours. Contracted independent study for topics not currently offered in regularly scheduled courses. Independent study may include library and/or laboratory research and field projects. (F, Sp, Su)

- GEOG 5003 The Global City And Planning Issues 3 Credit Hours**  
(Crosslisted with RCPL 5003; Slashlisted with 4003) Prerequisite: graduate standing. An introduction to the concept of globalization and its effects on cities, and the city planning issues related to those effects. Characteristics, theories, and strategies of city development are reviewed. Cities are observed from several perspectives: natural and built environment, governance, society, economics, and history. No student may earn credit for both 4003 and 5003. (Sp)
- GEOG 5023 Geography of Health and Disease 3 Credit Hours**  
(Slashlisted with GEOG 4023) Prerequisite: Graduate standing or permission of instructor. This course offers a holistic view on "one health" (interconnectedness of human, animal, and environmental health) by linking health and disease outcomes to the socio-cultural and physical environment that generate them. Lectures and discussion/lab sections will focus on basic concepts, principles, and methodologies in health studies, landscape epidemiology, global health under changing climate, health disparities, healthcare and medical service planning. No student may earn credit for both 4023 and 5023. (Sp)
- GEOG 5033 Human Impact on the Earth 3 Credit Hours**  
(Slashlisted with GEOG 4033) Prerequisite: Graduate standing. The earth has been radically transformed by human action. This course explores the human-induced "why" and the extent of global environmental change. The need to explain, predict and prevent such change led to the development of transdisciplinary approaches examining complex human-environmental relationships. Course discusses the current, international global environmental science research agendas within the context of social and environmental justice. No student may earn credit for both 4033 and 5033. (Sp)
- GEOG 5043 Urban Climatology 3 Credit Hours**  
(Slashlisted with GEOG 4043; Crosslisted with METR 5043) Prerequisite: Graduate standing or departmental permission. This course provides an overview of urban climates based on a synthesis of modern scientific and applied research findings. The course covers a broad spectrum of topics such as urban airflow, radiation exchanges, urban energy balance, urban heat island, urban surface hydrology, air pollution, cities under global climate change, biometeorology, and sustainable urban design and planning. No student may earn credit for both 4043 and 5043. (Sp)
- GEOG 5113 Quantitative Methods in Geographic and Environmental Research 3 Credit Hours**  
Prerequisite: Graduate standing. An introduction to quantitative research design and problem-solving research techniques useful for geographical and other environmental and social research. (F, Sp)
- GEOG 5123 Cities and Society 3 Credit Hours**  
(Slashlisted with GEOG 4123) Prerequisite: Graduate standing or permission of instructor. The course introduces students to the geography of cities—history of cities in human society, connections between urban policies and social outcomes, challenges in constructing a city that works for all. Key concepts include city planning, industrialization, housing, transportation, social/racial/environmental justice, gentrification, and the future of cities. No student may earn credit for both 4123 and 5123. No student may earn credit for both 4123 and 5123. (F)
- GEOG 5183 Patterns and Processes in Landscape Ecology 3 Credit Hours**  
(Slashlisted with GEOG 4183) Prerequisite: Graduate standing. This course will identify and evaluate the central constructs and methods of landscape ecology, focusing on the role of humans in creating and affecting landscape patterns and processes. Topics covered include fundamentals/frameworks of landscape ecology; how spatial patterns influence ecosystem, management, and conservation; how to quantify spatial pattern; and how to identify general drivers of landscape pattern. No student may earn credit for both 4183 and 5183. (F)
- GEOG 5200 Internship in Geography 1-3 Credit Hours**  
Prerequisite: graduate standing. May be repeated; maximum credit six hours. Provides career training experience for students, allowing them to apply their skills and theoretical constructs in a real world setting in industry, business, government agencies or educational institutions. (F, Sp)
- GEOG 5213 Principles and Practice of Urban Planning 3 Credit Hours**  
(Crosslisted with RCPL 5213) Prerequisite: open to seniors in social science departments, architecture and civil engineering and to graduate students in regional and city planning. A lecture course which examines the physical, social, economic and public interest determinants of land use; the economic population and land use studies required to provide the basis for planning; space and location requirements and design characteristics for residential, commercial, industrial and public uses of land; and the study of urban traffic as a function of land use in terms of structure and systems of movement. (F, Su)
- GEOG 5253 The Economics of Sustainability 3 Credit Hours**  
Prerequisites: graduate standing or permission of instructor. This course critiques various approaches to understanding the economics of sustainability, including neoclassical economic perspectives, environmental economics, and ecological economics. Students will examine the links between the natural environment and the human economy. (Sp)
- GEOG 5273 Regional Climatology 3 Credit Hours**  
(Slashlisted with GEOG 4273) Prerequisite: Graduate standing. Investigates the nature of the Earth's climate and provides an examination of ideas about atmospheric circulation. Topics include radiation, the hydrologic cycle, general circulation, local and regional climates, and global climate change. Specific attention is focused on the climatic water budget, its utility in evaluating local and regional climates, the role of climate models, and issues in applied climatology. No student may earn credit for both 4273 and 5273. (Ireg.)
- GEOG 5283 Biogeography 3 Credit Hours**  
(Slashlisted with GEOG 4283) Prerequisite: Graduate Standing. Biogeography is the study of the spatial distribution, past and present, of plant and animal species and biodiversity. Course topics include factors affecting the distribution of species, the role of biogeography in biological conservation and understanding a changing world. No student may earn credit for both 4283 and 5283. (F)
- GEOG 5293 Hydrologic Science 3 Credit Hours**  
(Slashlisted with GEOG 4293) Prerequisite: Math 1823 or 1914 and either Physics 2414, 2514 or Chemistry 1315, or the equivalents and graduate standing. Study of the processes which control the storage and movement of water at global, regional, and local scales. The emphasis is on the land portion of the hydrologic cycle, and includes the study of processes such as infiltration, soil water flow in the saturated and unsaturated zone, rainfall/runoff and evaporation. Lab sections include exercises on a computer in the field and in a soils lab. No student may earn credit for both 4293 and 5293. (Sp)

- GEOG 5313 Interpreting Society and Environment: Qualitative Research Methods** **3 Credit Hours**  
(Slashlisted with GEOG 4313) Prerequisites: graduate standing. This class approaches qualitative research methods from the perspective of human geography. That makes it especially useful for students who want to investigate the intersections of social and environmental relationships: be they historical, contemporary, or future (as in planning). No student may earn credit for both 4313 and 5313. (F)
- GEOG 5333 Corporate Environmental Strategy** **3 Credit Hours**  
(Slashlisted with GEOG 4333) Prerequisite: graduate standing or permission of instructor. Examination of the importance of environmental science and technology for corporations seeking sustainability. Students attain an understanding of the private sector as a force for positive environmental change and the dimensions of the natural environment in the competitive market. Corporate case students are discussed to improve understanding of strategic decision making. No student may earn credit for both 4333 and 5333. (Sp)
- GEOG 5343 Climate, History, and Society** **3 Credit Hours**  
(Slashlisted with 4343) Prerequisite: graduate standing or permission of instructor. This course is an overview of the mutual interactions of climate and human activities, and examines historical examples of significant climatic impacts. The course includes investigation of the nature of earth's climate and a synthesis of contemporary scientific ideas about the climate and its environmental and societal impacts. No student may earn credit for both 4343 and 5343. (Irreg.)
- GEOG 5423 Environmental Justice** **3 Credit Hours**  
(Slashlisted with GEOG 4423) Prerequisite: graduate standing. This course will cover environmental injustices related to environmental hazards (e.g., air and water pollution, toxic and hazardous waste, industrial byproducts) as well as injustices related to environmental benefits (e.g., access to parks, greenery, and clean environments). Throughout the course, we will engage with environmental racism. No student may earn credit for both 4423 and 5423. (Sp)
- GEOG 5433 Sustainability: Theory and Practice** **3 Credit Hours**  
Prerequisites: graduate standing or permission of instructor. This course examines the concept of sustainability from a human development perspective. A set of sustainability principles are critiqued to provide an understanding of the difficulty facing human systems to solve environmental, social and economic challenges. (Sp)
- GEOG 5513 Real-world Applications of Climate and Weather Information** **3 Credit Hours**  
(Slashlisted with GEOG 4513) Prerequisite: Graduate standing. The purpose of this class is to broaden the perspective of students to the use of climate information in agriculture, energy, water resources, public health, and other areas of society. Field trip. No student may earn credit for both 4513 and 5513. (Sp)
- GEOG 5523 Life Cycle Analysis** **3 Credit Hours**  
(Slashlisted with GEOG 4523) Prerequisite: Graduate Standing. This course provides graduate students with an understanding of Life Cycle Analysis both with respect to its conceptual foundations as well as its applications across a variety of socially important sectors. No student may earn credit for both 4523 and 5523. (Sp.)
- GEOG 5583 Energy Systems and Sustainability** **3 Credit Hours**  
(Slashlisted with GEOG 4583) Prerequisite: Graduate standing or permission of instructor. An understanding of interdisciplinary elements and perspectives associated with energy systems in the context of sustainability. It examines current and future energy supply, transmission, and demand management options. A critical focus on the economic, social, and environmental implications of energy system transitions will help identify energy technology and infrastructure solutions while understanding the institutional and organizational changes necessary for implementation. No student may earn credit for both 4583 and 5583. (F)
- GEOG 5653 Urban Sustainability: Nature, Justice, and the City** **3 Credit Hours**  
(Slashlisted with GEOG 4653) Prerequisite: Graduate standing. This course explores the sustainability challenges our cities face and how we might address them from critical perspectives in urban studies, planning, and geography. Through guest speakers, films, field trips and reading discussions, we will learn about the historical, multi-spatial, political, and representational dimensions of urban sustainability, and analyze the implications of different approaches to urban sustainability. No student may earn credit for both 4653 and 5653. (F)
- GEOG 5663 Water and Society** **3 Credit Hours**  
(Slashlisted with GEOG 4663) Prerequisite: Graduate standing. To examine assumptions and understanding of the accessibility, quality, and distribution of water, the forces driving social change related to water, and the likely course of water and society issues in the future. A major objective is to challenge students to critically think about policy, and how we might develop effective, equitable, and just water policy for the 21st century. No student may earn credit for both 4663 and 5663. (F)
- GEOG 5713 Dynamic Modeling of Socio-Environmental Systems** **3 Credit Hours**  
(Slashlisted with GEOG 4713) Prerequisite: Graduate standing. This course is an overview of the use of modeling and simulation to document, analyze, and project the dynamic behavior of socio-environmental systems. The course covers an introduction of basic modeling and simulation terminology and three different approaches to modeling temporal and/or spatial dynamics: system dynamics modeling, agent-based modeling, and cellular automata. No student may earn credit for both 4713 and 5713. (Sp)
- GEOG 5753 Transportation Geography and Planning** **3 Credit Hours**  
(Slashlisted with GEOG 4753; Crosslisted with RCPL 5753) Prerequisite: Graduate standing. This course is intended to introduce students to the world of transportation planning and geography by explaining the importance of transportation from local to global and by engaging them in everyday transportation activities. Topics include, but not limited to, the history of transportation, the relationships between transportation and geography, transportation managements and policies, and urban transportation systems. No student may earn credit for both 4753 and 5753. (Sp)
- GEOG 5863 Regional Geographies of Indigenous Media** **3 Credit Hours**  
(Slashlisted with GEOG 4863) Prerequisite: Graduate standing. Learn about the making, moving, and meanings of Indigenous media. Regional case studies feature scholarly readings that examine the geographically- and culturally-specific contexts from which particular forms of Indigenous media emerge. Ample video viewings allow us to explore the contents of media made by Indigenous artists/activists/intellectuals and their allies who live and/or work in a particular region. No student may earn credit for both 4863 and 5863. (Irreg.)

- GEOG 5943 Natural Hazards 3 Credit Hours**  
(Slashlisted with GEOG 4943) Prerequisite: graduate standing. Examines changes in patterns of a range of natural hazards and the impact they have on society. The course will examine general concepts of hazard mitigation and design and our perceptions of risk and how that affects preparedness and mitigation decisions. No student may earn credit for both 4943 and 5943. (F)
- GEOG 5960 Directed Readings 1-3 Credit Hours**  
1 to 3 hours. Prerequisite: graduate standing and permission of department. May be repeated; maximum credit twelve hours. Directed readings and/or literature reviews under the direction of a faculty member. (F, Sp, Su)
- GEOG 5970 Special Topics/Seminar 1-3 Credit Hours**  
1 to 3 hours. Prerequisite: Graduate standing or permission of instructor. May be repeated; maximum credit nine hours. Special topics or seminar course for content not currently offered in regularly scheduled courses. May include library and/or laboratory research and field projects. (Irreg.)
- GEOG 5980 Research for Master's Thesis 2-9 Credit Hours**  
Variable enrollment, two to nine hours; maximum credit applicable toward degree, four hours. Laboratory (F, Sp, Su)
- GEOG 5990 Selected Studies in Geography 1-4 Credit Hours**  
1 to 4 hours. Prerequisite: teacher's certificate or bachelor's degree and permission. May be repeated with change of subject matter; maximum credit eight hours. Designed to afford either an intensive study of a systematic field or an extensive coverage of broad problem topics in geography. (F, Sp, Su)
- GEOG 6220 Seminar in Human Geography 1-3 Credit Hours**  
1 to 3 hours. Prerequisite: twelve hours of geography or permission. May be repeated with change of subject matter; maximum credit fifteen hours. Directed studies in one of the major divisions of human geography. (Irreg.) Sec. 1 - Urban Geography Sec. 2 - Settlement Patterns Sec. 3 - Historical Geography Sec. 4 - Cultural Ecology Sec. 5 - Cultural Geography Sec. 6 - Economic Development Sec. 7 - Political Geography Sec. 8 - Social Geography Sec. 9 - Regional Geography Sec. 10 - Political Ecology .
- GEOG 6230 Seminar in Economic Geography 1-3 Credit Hours**  
1 to 3 hours. Prerequisite: twelve hours of geography or permission. May be repeated with change of subject matter; maximum credit 15 hours. Directed studies in one of the major divisions of economic geography. (Irreg.)
- GEOG 6240 Seminar in Geography and Environmental Sustainability 1-3 Credit Hours**  
1 to 3 hours. Prerequisite: Graduate standing. May be repeated with change of subject matter; maximum credits 15 hours. Directed studies in one of the major aspects of geography and environmental sustainability. Possible topics include: coupled human-natural systems, energy resources, land use, sustainable development, water systems, geospatial technologies, and climate change. (Irreg.)
- GEOG 6950 Research Problems in Geography 1-6 Credit Hours**  
1 to 6 hours. Prerequisite: graduate standing in geography, permission. May be repeated with change of subject matter; maximum credit 15 hours. Advanced independent research on any systematic or regional topic within the scope of geography appropriate to the library facilities or field study opportunities available to the student. (F, Sp, Su)
- GEOG 6953 Research and Professional Development 3 Credit Hours**  
Prerequisite: Graduate standing and majors in the Department of Geography and Environmental Sustainability, or permission of instructor. This course provides a comprehensive background on the practice of geographic and environmental research. Students learn about current issues while exploring employment opportunities in environmental and geographical fields and practicing formal research presentations. They also formulate a research proposal, including literature review, methodology, and consideration of ethics. (Sp)
- GEOG 6960 Directed Readings 1-3 Credit Hours**  
1 to 3 hours. Prerequisite: graduate standing or permission of instructor. May be repeated; maximum credit six hours. Directed readings and/or literature review under the direction of a faculty member. (Irreg.)
- GEOG 6970 Special Topics/Seminar 1-3 Credit Hours**  
1 to 3 hours. Prerequisite: graduate standing or permission of instructor. May be repeated; maximum credit 12 hours. Special topics or seminar course for content not currently offered in regularly scheduled courses. May include library and/or research and field projects. (Irreg.)
- GEOG 6973 Thinking about Geography and Environmental Sustainability 3 Credit Hours**  
Prerequisite: Graduate standing. This course addresses the foundational concepts of geography and environmental sustainability, emphasizing the intersection of human and natural systems. Students explore the relevance of, and possibilities for, real world impacts of geographic and environmental research. (F)
- GEOG 6980 Research for Doctoral Dissertation 2-16 Credit Hours**  
2 to 16 hours. Prerequisite: Graduate standing and permission of instructor; may be repeated. Directed research culminating in the completion of the doctoral dissertation. (F, Sp, Su)
- GEOG 6990 Independent Study 1-3 Credit Hours**  
1 to 3 hours. Prerequisite: Graduate standing and permission of instructor. May be repeated; maximum credit nine hours. Contracted independent study for a topic not currently offered in regularly scheduled courses. Independent study may include library and/or laboratory research and field projects. (Irreg.)