

GEOGRAPHY (GEOG)

GEOG 1000 Introduction to Planet Earth (3 credits)

General Education: Scientific Ways of Knowing
Natural environment; nature, distribution, and relationships of climate, landforms, oceans, vegetation, hydrography, and soils. Three lectures and one 2-hour lab per week; may involve evening classes. Typically Offered: Fall, Spring and Summer.

GEOG 1000L Introduction to Planet Earth Lab (1 credit)

Natural environment; nature, distribution, and relationships of climate, landforms, oceans, vegetation, hydrography, and soils. Three lectures and one 2-hour lab per week; may involve evening classes. Typically Offered: Fall and Spring.

GEOG 1650 Human Geography (3 credits)

General Education: International, Social and Behavioral Ways of Knowing
Intro to geographical dimension in human behavior and how this is evident in population distribution, rural and urban land use, and social, economic, and political attributes of societies. Typically Offered: Varies.

GEOG 2000 World Cultures and Globalization (3 credits)

General Education: International, Social and Behavioral Ways of Knowing
Countries, regions, and peoples of the world; interrelationships between humans and their physical and cultural environments. Typically Offered: Spring. Cooperative: open to WSU degree-seeking students.

GEOG 2030 (s) Workshop (1-16 credits, max 99)

Credit arranged

GEOG 2040 (s) Special Topics (1-16 credits, max 99)

Credit arranged

GEOG 2200 The Geography of Middle Earth (3 credits)

The course will explore the various roles that geography and geographical thinking have had in Tolkien's master works and the ideas of imaginary worlds. It will cover the issues of landscape creation in an imagined environment as well as the nature of culture, language, and civilization in Tolkien's realm. These ideas are transferable to real-world situations. The details of landscape, geology, biology, religion, politics, and economics will also be discussed in the context of the various ethnolinguistic groups and geographically disparate groups. The approach will use humanistic geography, mythic metaphor, and chorography as analytical tools. Typically Offered: Spring.

GEOG 2600 Introduction to Geopolitics (3 credits)

General Education: International, Social and Behavioral Ways of Knowing
The course introduces students to contemporary approaches to geopolitics through the exploration of key geographic concepts and the ideas of structure and agency. Topics include terrorism, nationalism, militarism, borders, and environmental geopolitics. Current events are discussed to exemplify the concepts.

GEOG 2990 (s) Directed Study (1-16 credits, max 99)

Credit arranged

GEOG 3010 Meteorology (3 credits)

Atmospheric processes that produce weather; temperature; moisture, clouds, and precipitation; synoptic-scale weather; severe storms; weather instrumentation, weather maps, and forecasting; influences of weather on humans and impacts of humans on weather. Typically Offered: Fall.

Prereqs: MATH 1143 or equivalent

GEOG 3130 Global Climate Change (3 credits)

Joint-listed with GEOG 5130

Scientific basis of the climate system and global climate changes; process-based understanding of past, present, and future climate change; natural and anthropogenic influences; interactions between climate, society, and ecosystems; scientific review and politicization; climate change solutions and opportunities. Students in GEOG 5130 will be required to solve additional quantitative problem sets and synthesize journal articles. Typically Offered: Fall.

GEOG 3170 Tree Rings and Environmental Change (3 credits)

Joint-listed with GEOG 5170

Principles, techniques, and interpretation in tree-ring science. Applications in climate, ecology, forestry, and earth sciences. The course objectives are (1) to become proficient with the field and laboratory skills commonly used in tree-ring research, (2) to develop an understanding of the diversity of the applications of tree-ring science, and (3) to apply the techniques and knowledge learned in the course in addressing a specific topic of interest within the broad realm of geographic research. Additional work required for graduate credit. Typically Offered: Spring. Cooperative: open to WSU degree-seeking students.

GEOG 3300 Urban Geography (3 credits)

Joint-listed with GEOG 5310

Theory and models of the functions, origin, development, structure, and distribution of cities; land-use and housing, globalization and cities, neighborhood transition, urban economic development, and geographic aspects of city planning. Also considers urban social differences, inequality, and conflicts over the uses and meanings of city space. Graduate students are required to synthesize journal articles and complete an additional independent research paper.

GEOG 3450 Global Economic Geography (3 credits)

Joint-listed with GEOG 5450

An overview of major developments and contemporary debates in the economic geography literature; economic globalization, the spatial dimensions of resource use, agriculture, industry, and post-industry landscapes, economic aspects of land-use change, location theory and case studies. Additional projects required for graduate credit.

GEOG 3500 Sustainability of Global Development (3-4 credits)

General Education: International

Joint-listed with GEOG 5500

Geographic appraisal of resource problems and development potentials of the third world. One hour additional meeting per week or project for fourth credit. Additional assignments and exams required for graduate credit. Typically Offered: Fall and Spring. Cooperative: open to WSU degree-seeking students.

GEOG 3600 Population Dynamics and Distribution (3-4 credits)

General Education: International

Effects of fertility, mortality, and migration on population size and distribution; demographic trends in U. S. and other societies and how these relate to economic, political, environmental, and other factors. One hour additional meeting per week or project for fourth credit. Typically Offered: Spring.

GEOG 3650 Geopolitics and Conflict (3 credits)

General Education: International, Social and Behavioral Ways of Knowing
Joint-listed with GEOG 5650

Surveys the geographic distribution of political processes, actions, and outcomes at a variety of spatial scales, including international, national, and local. Topics include origins of the modern territorial state, conflicts over access to and use of space, access to natural resources, nationalism, elections, democratization, globalization, terrorism, and the politics of identity. Graduate students are required to complete an additional independent research paper. Typically Offered: Spring. Cooperative: open to WSU degree-seeking students.

GEOG 3850 Foundations of GIS (3 credits)

Intro to basic concepts and applications of geographic information systems (GIS), lab exercises on PC-based GIS packages. Two lectures and two hours of lab per week. Typically Offered: Fall and Spring.

Prereqs: Basic knowledge of PC-based operating system Cooperative: open to WSU degree-seeking students.

GEOG 3900 Cartographic Design & Geovisualization (3 credits)

Map projections, map generalization, cartographic design, map symbology, and typography; statistical, isarithmic, and multivariate mapping; static versus dynamic mapping; interactive and internet mapping; cartographic animation; two hours of lab per week. Typically Offered: Spring.

Prereqs: GEOG 3850

GEOG 4000 (s) Seminar (1-16 credits, max 99)

Credit arranged

GEOG 4010 Climatology (3 credits)

Physical basis for climatic processes and patterns; mechanics of global atmospheric circulation; radiation balance and heat budget of the earth; models of weather patterns and climate. Typically Offered: Spring (Even Years).

GEOG 4020 GIS Skills Development (1-3 credits, max 6)

Hands-on skills development in GIS and related technologies. Primary topics vary by semester, but may include topics such as GPS/GIS integration, web-based GIS, project management and cartographic design. May be taken for credit multiple times.

GEOG 4030 (s) Workshop (1-16 credits, max 99)

Credit arranged

GEOG 4040 (s) Special Topics (1-16 credits, max 99)

Credit arranged

GEOG 4070 Spatial Analysis and Modeling (3 credits)

Joint-listed with GEOG 5070

Introduces the basic theories and methods of spatial analysis used for statistical modeling and problem solving in human and physical geography. The special nature of spatial data (point, continuous, and lattice) in the social and physical sciences is emphasized. Topics include point pattern analysis, spatial autocorrelation analysis, spatial multivariate regression, local indicators of spatial association, and geographically weighted regression. Extra oral and/or written assignments required for graduate credit.

Prereqs: STAT 4310 or permission Cooperative: open to WSU degree-seeking students.

GEOG 4100 Biogeography (3 credits)

Geographic distributions of plant and animal species, and causes of patterns, including climate, geology, speciation, extinction, and migration. Typically Offered: Spring.

Prereqs: GEOG 1000/GEOG 1000L or FOR 2100 or WLF 2200.

Cooperative: open to WSU degree-seeking students.

GEOG 4110 Natural Hazards (3 credits)

Joint-listed with GEOG 5610

Overview of the physical drivers and factors associated with natural hazards including impacts on community and landscape resilience and sustainability. Topics include geospatial analysis and modeling or projected risks and methods to monitor impacts of natural hazards on human communities and landscapes. Other topics include a survey of natural hazards, their controlling factors, and recognition of hazard potential, with an emphasis on floods, earthquakes, landslides, fires, volcanic eruptions, tsunamis, risk assessment, etc. Additional work required for graduate credit. Typically Offered: Fall (Even Years) and Summer. Cooperative: open to WSU degree-seeking students.

GEOG 4140 Socioeconomic Applications of GIS (3 credits)

This course explores the use of geographic information systems (GIS) in various socioeconomic research fields, including, but not limited to, urban planning, transportation, public health, environmental justice, crime analysis, and retail/business location etc. A major goal of this course is to teach students how to integrate geographical information techniques and data analytics with their future or ongoing research and real-world applications in the fields of social sciences. The course will be a combination of lectures and labs. The basic concepts, methodologies, and theories will be introduced in the lecture, and the lab sections are designed to give students hands-on experience using ArcGIS to complete a series of real-world projects.

Prereqs: GEOG 3850 or equivalent

GEOG 4200 Land, Resources, and Environment (3 credits)

Social, legal, cultural, political, and economic aspects of land-use control both in the United States and worldwide. Contrasts are made between indigenous and contemporary cultures within a sustainable geography-of-limits and political ecology framework. Typically Offered: Fall. Cooperative: open to WSU degree-seeking students.

GEOG 4240 Hydrologic Applications of GIS and Remote Sensing (3 credits)

Joint-listed with GEOG 5240

Concepts of area-based hydrologic modeling and assessment and the various types of spatially distributed information commonly used in these activities, such as topographic data, vegetation cover, soils and meteorologic data. Hands-on experience in manipulating these types of data sets for hydrologic applications via weekly ArcGIS lab exercises.

Additional project work required for graduate credit. Recommended Preparation: FOR 4600, CE 3250 or equivalent. Typically Offered: Fall.

Prereqs: GEOG 3850 or FOR 3700 Cooperative: open to WSU degree-seeking students.

GEOG 4300 Climate Change Ecology (3 credits)

Climate change impacts on ecosystems, plants, and animals; feedbacks to climate change; climate change mitigation related to ecosystems and species. Typically Offered: Spring.

Prereqs: BIOL 1140 or ENV5 1010 or GEOG 1000 or FOR 2100/REM 2210/WLF 2200 or Instructor Permission Cooperative: open to WSU degree-seeking students.

GEOG 4350 Climate Change Mitigation (3 credits)

Joint-listed with GEOG 5350

Technical, environmental, social, and economic aspects of planning and implementing actions that reduce the emission of, or enhance sinks of greenhouse gases, from the local to international scale. Linkages are made to sustainable energy systems, sustainable community planning and transportation options; sustainable food systems, and international sustainable development goals. Environmental justice considerations and effective communication of climate change solutions are also discussed. Additional work will be required for graduate credit. Recommended preparation: GEOG 3130 Typically Offered: Spring. Cooperative: open to WSU degree-seeking students.

GEOG 4530 Water and Energy Systems (3 credits)

The class covers the basic science of water and energy and the applied interrelationships of those two resources in today's society. The broad spectrum coverage of the topic includes the energy linkage to both the supply and demand of water and also the water linkage to the supply of and demand for energy. The class includes development of systems dynamics models for describing the resource interactions. Recommended preparation: basic physical sciences

Prereqs: MATH 1143

GEOG 4550 Societal Resilience and Adaptation to Climate Change (3 credits)

Consequences of human causes, mitigation and adaptations, community resilience strategies, and policy implications to human impacts of global climate change. Concentration on social science issues, including opportunities and constraints for resilience and adaptation to global climate change. Recommended Preparation: GEOG 4110.

GEOG 4750 Intermediate GIS (3 credits)

Course covers in-depth geographic information systems models and applications. Topics include network analysis, watershed analysis, spatial interpolation, terrain mapping and analysis, 3D visualization, and GIS modeling. Students develop spatial analysis and modeling skills to solve real-world problems. Typically Offered: Spring.

Prereqs: GEOG 3850

Coreqs: STAT 2510 Cooperative: open to WSU degree-seeking students

GEOG 4790 GIS Programming (3 credits)

Joint-listed with GEOG 5790

Introduction to using computer programming to solve geospatial problems. Basic programming concepts as well as integration with ArcGIS are covered. Students learn Python and complete lab assignments on managing, processing, and plotting geographic and attribute data. Additional work will be required for graduate credit. Recommended preparation for graduate students: GEOG 5250 Typically Offered: Fall.

Prereqs: GEOG 3850 or equivalent Cooperative: open to WSU degree-seeking students.

GEOG 4830 Remote Sensing/GIS Image Analysis (3 credits)

Joint-listed with GEOG 5830

Concepts and tools for the processing, analysis, and interpretation of digital images from satellite and aircraft-based sensors. The integration of remotely sensed data and the other spatial data types within Geographic Information Systems. Additional assignments and exams required for graduate credit. Two lectures and two hours of lab per week. Typically Offered: Spring. Cooperative: open to WSU degree-seeking students.

Coreqs: GEOG 3850 or FOR 3700 or equivalent

GEOG 4870 (s) Topics in Geospatial Analysis (1-3 credits, max 6)

Joint-listed with GEOG 5870

Current topics and applications in remote sensing, GIS, and/or spatial analysis. Topics to vary by instructor and current trends in the field. Recommended preparation: At least two courses in GIS and/or one in remote sensing, depending on topic. Additional course project required for graduate credit. Typically Offered: Summer.

GEOG 4880 Geography of Energy Systems (3 credits)

Joint-listed with GEOG 5880

This course examines geographic dimensions associated with the production, distribution, acquisition, consumption, and storage of energy. Geographic tools and techniques will be used to analyze, understand, and deconstruct complexity and nuance across various modes of production, current topics, and challenges along with future considerations such as transitioning to renewable energy sources. The course will split time between classroom settings, field trips to energy installations on campus, and across the inland Northwest, in addition to applied learning activities. Additional readings, assignments and project required for graduate credit. Typically Offered: Fall (Even Years). Cooperative: open to WSU degree-seeking students.

GEOG 4930 Senior Capstone in Geography (3 credits)

General Education: Capstone Experience

A capstone course in which students integrate their knowledge of human and physical geography, as well as geographic techniques, to propose solutions to real-world problems. Students gain experience in working in small groups and in written and oral presentation of project results, and will be evaluated with respect to the skills acquired in their degree program. Topics may include, but are not limited to, issues such as sustainable development in rural communities, global and regional food and energy distribution, and quantifying and analyzing global or regional indicators of environmental and/or societal trends. Open to senior geography majors or to nonmajors with instructor permission.

Prereqs: Department of Earth and Spatial Sciences majors or permission

GEOG 4980 (s) Internship (1-16 credits, max 99)

Credit arranged. Graded Pass/Fail.

GEOG 4990 (s) Directed Study (1-16 credits, max 99)

Credit arranged

GEOG 5000 Master's Research and Thesis (1-16 credits, max 99)

Credit arranged

GEOG 5010 (s) Seminar (1-16 credits, max 99)

Credit arranged

GEOG 5020 (s) Directed Study (1-16 credits, max 99)

Credit arranged

GEOG 5030 (s) Workshop (1-16 credits, max 99)

Credit arranged

GEOG 5040 (s) Special Topics (1-16 credits, max 99)

Credit arranged

GEOG 5070 Spatial Analysis and Modeling (3 credits)

Joint-listed with GEOG 4070

Introduces the basic theories and methods of spatial analysis used for statistical modeling and problem solving in human and physical geography. The special nature of spatial data (point, continuous, and lattice) in the social and physical sciences is emphasized. Topics include point pattern analysis, spatial autocorrelation analysis, spatial multivariate regression, local indicators of spatial association, and geographically weighted regression. Extra oral and/or written assignments required for graduate credit. Cooperative: open to WSU degree-seeking students.

GEOG 5130 Global Climate Change (3 credits)

Joint-listed with GEOG 3130

Scientific basis of the climate system and global climate changes; process-based understanding of past, present, and future climate change; natural and anthropogenic influences; interactions between climate, society, and ecosystems; scientific review and politicization; climate change solutions and opportunities. Students in GEOG 5130 will be required to solve additional quantitative problem sets and synthesize journal articles. Typically Offered: Fall.

GEOG 5150 Pyrogeography (3 credits)

An introduction to the field of pyrogeography that focuses on the fire being a cornerstone of a sustainable society in the Anthropocene. Topics include the global study of the past, present, and projected distribution of wildfire and the interconnection with fire ecology and cultural geography. The course will include readings and discussions of recent scientific literature. Typically Offered: Summer.

GEOG 5170 Tree Rings and Environmental Change (3 credits)

Joint-listed with GEOG 3170

Principles, techniques, and interpretation in tree-ring science. Applications in climate, ecology, forestry, and earth sciences. The course objectives are (1) to become proficient with the field and laboratory skills commonly used in tree-ring research, (2) to develop an understanding of the diversity of the applications of tree-ring science, and (3) to apply the techniques and knowledge learned in the course in addressing a specific topic of interest within the broad realm of geographic research. Additional work required for graduate credit. Typically Offered: Spring. Cooperative: open to WSU degree-seeking students.

GEOG 5240 Hydrologic Applications of GIS and Remote Sensing (3 credits)

Joint-listed with GEOG 4240

Concepts of area-based hydrologic modeling and assessment and the various types of spatially distributed information commonly used in these activities, such as topographic data, vegetation cover, soils and meteorologic data. Hands-on experience in manipulating these types of data sets for hydrologic applications via weekly ArcGIS lab exercises. Additional project work required for graduate credit. Recommended Preparation: FOR 4600, CE 3250 or equivalent. Typically Offered: Fall. Cooperative: open to WSU degree-seeking students.

GEOG 5250 Graduate GIS Fundamentals (3 credits)

Introductory graduate level course in Geographic Information Systems (GIS). Students will learn how to use GIS to manage, integrate, analyze, and visualize geospatial data and information. GIS can be used to explore patterns and relationships in geographic data, seek explanations, and develop solutions to pressing problems. The basic concepts of GIS will be introduced in the lecture, and the lab section will help students develop ArcGIS Pro skills. We explore the theory underlying sources of spatial data such as passive and active remote sensing imagery and apply geo-analytical and data exploration methods to integrated problems. Typically Offered: Fall, Spring and Summer. Cooperative: open to WSU degree-seeking students.

GEOG 5310 Urban Geography (3 credits)

Joint-listed with GEOG 3300

Theory and models of the functions, origin, development, structure, and distribution of cities; land-use and housing, globalization and cities, neighborhood transition, urban economic development, and geographic aspects of city planning. Also considers urban social differences, inequality, and conflicts over the uses and meanings of city space. Graduate students are required to synthesize journal articles and complete an additional independent research paper.

GEOG 5350 Climate Change Mitigation (3 credits)

Joint-listed with GEOG 4350

Technical, environmental, social, and economic aspects of planning and implementing actions that reduce the emission of, or enhance sinks of greenhouse gases, from the local to international scale. Linkages are made to sustainable energy systems, sustainable community planning and transportation options; sustainable food systems, and international sustainable development goals. Environmental justice considerations and effective communication of climate change solutions are also discussed. Additional work will be required for graduate credit. Recommended preparation: GEOG 3130 Typically Offered: Spring. Cooperative: open to WSU degree-seeking students.

GEOG 5450 Global Economic Geography (3 credits)

Joint-listed with GEOG 3450

An overview of major developments and contemporary debates in the economic geography literature; economic globalization, the spatial dimensions of resource use, agriculture, industry, and post-industry landscapes, economic aspects of land-use change, location theory and case studies. Additional projects required for graduate credit.

GEOG 5500 Sustainability of Global Development (3-4 credits)

General Education: International

Joint-listed with GEOG 3500

Geographic appraisal of resource problems and development potentials of the third world. One hour additional meeting per week or project for fourth credit. Additional assignments and exams required for graduate credit. Typically Offered: Fall and Spring. Cooperative: open to WSU degree-seeking students.

GEOG 5600 Population Dynamics and Distribution (3-4 credits)

Effects of fertility, mortality, and migration on population size and distribution; demographic trends in U. S. and other societies and how these relate to economic, political, environmental, and other factors. One hour additional meeting per week or project for fourth credit. Typically Offered: Spring.

GEOG 5610 Natural Hazards (3 credits)

Joint-listed with GEOG 4110

Overview of the physical drivers and factors associated with natural hazards including impacts on community and landscape resilience and sustainability. Topics include geospatial analysis and modeling or projected risks and methods to monitor impacts of natural hazards on human communities and landscapes. Other topics include a survey of natural hazards, their controlling factors, and recognition of hazard potential, with an emphasis on floods, earthquakes, landslides, fires, volcanic eruptions, tsunamis, risk assessment, etc. Additional work required for graduate credit. Typically Offered: Fall (Even Years) and Summer. Cooperative: open to WSU degree-seeking students.

GEOG 5650 Geopolitics and Conflict (3 credits)

General Education: International, Social and Behavioral Ways of Knowing

Joint-listed with GEOG 3650

Surveys the geographic distribution of political processes, actions, and outcomes at a variety of spatial scales, including international, national, and local. Topics include origins of the modern territorial state, conflicts over access to and use of space, access to natural resources, nationalism, elections, democratization, globalization, terrorism, and the politics of identity. Graduate students are required to complete an additional independent research paper. Typically Offered: Spring. Cooperative: open to WSU degree-seeking students.

GEOG 5790 GIS Programming (3 credits)

Joint-listed with GEOG 4790

Introduction to using computer programming to solve geospatial problems. Basic programming concepts as well as integration with ArcGIS are covered. Students learn Python and complete lab assignments on managing, processing, and plotting geographic and attribute data. Additional work will be required for graduate credit. Recommended preparation for graduate students: GEOG 5250 Typically Offered: Fall. Cooperative: open to WSU degree-seeking students.

GEOG 5830 Remote Sensing/GIS Image Analysis (3 credits)

Joint-listed with GEOG 4830

Concepts and tools for the processing, analysis, and interpretation of digital images from satellite and aircraft-based sensors. The integration of remotely sensed data and the other spatial data types within Geographic Information Systems. Additional assignments and exams required for graduate credit. Two lectures and two hours of lab per week. Typically Offered: Spring. Cooperative: open to WSU degree-seeking students.

Coreqs: GEOG 3850 or FOR 3700 or equivalent

GEOG 5870 (s) Topics in Geospatial Analysis (1-3 credits, max 6)

Joint-listed with GEOG 4870

Current topics and applications in remote sensing, GIS, and/or spatial analysis. Topics to vary by instructor and current trends in the field. Recommended preparation: At least two courses in GIS and/or one in remote sensing, depending on topic. Additional course project required for graduate credit. Typically Offered: Summer.

GEOG 5880 Geography of Energy Systems (3 credits)

Joint-listed with GEOG 4880

This course examines geographic dimensions associated with the production, distribution, acquisition, consumption, and storage of energy. Geographic tools and techniques will be used to analyze, understand, and deconstruct complexity and nuance across various modes of production, current topics, and challenges along with future considerations such as transitioning to renewable energy sources. The course will split time between classroom settings, field trips to energy installations on campus, and across the inland Northwest, in addition to applied learning activities. Additional readings, assignments and project required for graduate credit. Typically Offered: Fall (Even Years). Cooperative: open to WSU degree-seeking students.

GEOG 5910 History and Philosophy of Geography (3 credits)

Cross-listed with ESS 5910

Evolution of earth sciences as scientific disciplines, focusing on post-scientific revolution developments and identification of major themes in contemporary thought. Discussions include the history of geography and geology and the emergence of integrated earth and climate sciences. Typically Offered: Fall (Odd Years). Cooperative: open to WSU degree-seeking students.

GEOG 5930 Geovisualization (3 credits)

Covers methods for visualization and analyzing of spatial data. This includes modern data visualization techniques such as incorporation of modeling results, remote sensing and geographic information system layers, and dynamic virtual assets within virtual environments. Typically Offered: Spring and Summer.

GEOG 5960 Geography Department Seminar (1 credit)

Weekly or bi-weekly department seminar with talks given by visiting and local speakers on topics relevant to geography.

GEOG 5970 (s) Practicum (1-16 credits, max 99)

Credit arranged Graded Pass/Fail. Typically Offered: Varies.

GEOG 5980 (s) Internship (1-16 credits, max 99)

Credit arranged. Practical, on-the-job experience with governmental agencies or commercial establishments; oral and written reports are presented in which the student reviews and constructively criticizes the experience gained; salary may be received for services performed. Graded Pass/Fail.

Prereqs: Permission

GEOG 5990 (s) Research (1-16 credits, max 99)

Credit arranged. Research not directly related to a thesis or dissertation.

Prereqs: Permission

GEOG 6000 Doctoral Research and Dissertation (1-45 credits, max 99)

Credit arranged