

# GEOGRAPHY

The Geography Department offers theoretical and applied work in human geography, environment and society geography, physical geography and geographic information science. Each subfield covers a broad range of topics. Human geography includes political, cultural, development, feminist, population and urban geography. Environment and society geography includes political ecology, natural hazards and conservation practice. Physical geography includes climatology, geomorphology, hydrology and biogeography. Geographic information science includes spatial analysis using GIS, remote sensing and cartography. The department also offers regionally focused courses on mountain geography and geographies of China, Latin America, Africa and South Asia. To complement its curriculum, the department also offers internship opportunities for geography majors.

The undergraduate degree in geography emphasizes knowledge and awareness of:

- The unique contributions of the discipline to understanding the spatial components of problems and the diverse factors relating to human interaction with the environment;
- The spatial distributions of physical and human characteristics on the Earth surface, the general patterns these form and the processes that have created and are changing these patterns;
- Major themes of geographical analysis, including human and physical characteristics of place; human-environmental relations; movement of people, ideas and products; and regionalization; and
- The general geographical principles of human-environment interaction, global change and human spatial organization.

In addition, students completing the degree in geography are expected to acquire proficiency in:

- One or more of the specific geographic skill areas of cartography, remote sensing and geographic information systems;
- Writing, quantitative methods, computer literacy, and library and field methods of data collection; and
- Identifying the geographic dimensions of a problem and analyzing, synthesizing and evaluating relevant data and applying geographic principles offering a geographic perspective on that problem.

The course code for this program is GEOG.

## Geography Honors Program

Students interested in earning honors with their work in geography should contact the departmental honors advisor during their junior year.

## Geography Internship Program

To complement its curriculum, the department offers geography majors internship opportunities that can be used to earn credit towards their degree. Students interested in pursuing an internship should contact the Department for information on eligibility and terms.

## Residential Academic Program

Students may visit the Geography Department Office to learn more about the Baker Residential Academic Program (<https://www.colorado.edu/bakerrap/>).

## Minimum Academic Preparation Standards (MAPS)

Students who matriculated at CU Boulder prior to the summer of 2023 and thus are still subject to MAPS can fill a MAP deficiency in geography by taking one of the following courses: GEOG 1962, GEOG 1972, GEOG 1982, GEOG 1992, GEOG 2092 or pass the Geography Exemption Exam. Arts and Sciences students, both continuing and transfer students, with a declared major and junior standing (57 credit hours minimum) may take GEOG 3682, GEOG 3742 or GEOG 4712 to fulfill the MAPS deficiency.

## Bachelor's Degree

- Geography - Bachelor of Arts (BA) (<https://catalog.colorado.edu/undergraduate/colleges-schools/arts-sciences/programs-study/geography/geography-bachelor-arts-ba/>)

## Minor

- Geography - Minor (<https://catalog.colorado.edu/undergraduate/colleges-schools/arts-sciences/programs-study/geography/geography-minor/>)

## Certificates

- Arctic Studies - Certificate (<https://catalog.colorado.edu/undergraduate/colleges-schools/arts-sciences/programs-study/international-affairs/arctic-studies-certificate/>)
- GIS and Computational Science - Certificate (<https://catalog.colorado.edu/undergraduate/colleges-schools/arts-sciences/programs-study/geography/gis-computational-science-certificate/>)
- Hydrology - Certificate (<https://catalog.colorado.edu/undergraduate/colleges-schools/arts-sciences/programs-study/geography/hydrology-certificate/>)

## Faculty

While many faculty teach both undergraduate and graduate students, some instruct students at the undergraduate level only. For more information, contact the faculty member's home department.

Abdalati, Waleed ([https://experts.colorado.edu/display/fisid\\_145800/](https://experts.colorado.edu/display/fisid_145800/))  
Professor; PhD, University of Colorado Boulder

Balch, Jennifer Kakareka ([https://experts.colorado.edu/display/fisid\\_154464/](https://experts.colorado.edu/display/fisid_154464/))  
Associate Professor; PhD, Yale University

Barnard, Holly Rene ([https://experts.colorado.edu/display/fisid\\_147417/](https://experts.colorado.edu/display/fisid_147417/))  
Associate Professor, Associate Chair; PhD, Oregon State University

Blanken, Peter David ([https://experts.colorado.edu/display/fisid\\_114026/](https://experts.colorado.edu/display/fisid_114026/))  
Professor; PhD, University of British Columbia (Canada)

Boykoff, Maxwell Thomas ([https://experts.colorado.edu/display/fisid\\_147562/](https://experts.colorado.edu/display/fisid_147562/))  
Associate Professor Adjunct; PhD, University of California, Santa Cruz

Bryan, Joseph Henry ([https://experts.colorado.edu/display/fisid\\_145802/](https://experts.colorado.edu/display/fisid_145802/))  
Associate Chair, Associate Professor; PhD, University of California, Berkeley

Buttenfield, Barbara P. ([https://experts.colorado.edu/display/fisid\\_107860/](https://experts.colorado.edu/display/fisid_107860/))  
Professor Emerita; PhD, University of Washington

Caine, T. Nelson ([https://experts.colorado.edu/display/fisid\\_104285/](https://experts.colorado.edu/display/fisid_104285/))  
Professor Emeritus; PhD, Australian National University

Cao, Guofeng ([https://experts.colorado.edu/display/fisid\\_167522/](https://experts.colorado.edu/display/fisid_167522/))  
Assistant Professor; PhD, University of California Santa Barbara

Carroll, Clinton R. ([https://experts.colorado.edu/display/fisid\\_154726/](https://experts.colorado.edu/display/fisid_154726/))  
Assistant Professor Adjunct; PhD, University of California, Berkeley

Finlay, Jessica  
Assistant Professor; PhD, University of Minnesota, Minneapolis

Fluri, Jennifer L. ([https://experts.colorado.edu/display/fisid\\_154033/](https://experts.colorado.edu/display/fisid_154033/))  
Chair, Professor; PhD, Pennsylvania State University

Goldman, Mara Jill ([https://experts.colorado.edu/display/fisid\\_143542/](https://experts.colorado.edu/display/fisid_143542/))  
Associate Professor; PhD, University of Wisconsin–Madison

Harrison, Jill Lindsey ([https://experts.colorado.edu/display/fisid\\_149614/](https://experts.colorado.edu/display/fisid_149614/))  
Associate Professor; PhD, University of California, Santa Cruz

Isaacs, Rachel ([https://experts.colorado.edu/display/fisid\\_164240/](https://experts.colorado.edu/display/fisid_164240/))  
Teaching Assistant Professor; PhD, Pennsylvania State University

Karimzadeh, Morteza ([https://experts.colorado.edu/display/fisid\\_166081/](https://experts.colorado.edu/display/fisid_166081/))  
Assistant Professor; PhD, Pennsylvania State University

Leyk, Stefan ([https://experts.colorado.edu/display/fisid\\_145192/](https://experts.colorado.edu/display/fisid_145192/))  
Professor, Associate Chair; PhD, University of Zurich (Switzerland)

Lininger, Katherine ([https://experts.colorado.edu/display/fisid\\_163643/](https://experts.colorado.edu/display/fisid_163643/))  
Assistant Professor; PhD, Colorado State University

Mohan, Taneesha  
Teaching Assistant Professor; Ph.D., London School of Economics and Political Science

Molotch, Noah Paul ([https://experts.colorado.edu/display/fisid\\_139374/](https://experts.colorado.edu/display/fisid_139374/))  
Associate Professor; PhD, University of Arizona

Musselman, N. Keith ([https://experts.colorado.edu/display/fisid\\_151215/](https://experts.colorado.edu/display/fisid_151215/))  
Assistant Professor; Ph.D, University of California- Los Angeles

O'Loughlin, John ([https://experts.colorado.edu/display/fisid\\_101339/](https://experts.colorado.edu/display/fisid_101339/))  
Professor; PhD, Pennsylvania State University

Oakes, Tim ([https://experts.colorado.edu/display/fisid\\_109269/](https://experts.colorado.edu/display/fisid_109269/))  
Professor; PhD, University of Washington

Pitlick, John  
Professor Emeritus

Reid, Colleen ([https://experts.colorado.edu/display/fisid\\_157951/](https://experts.colorado.edu/display/fisid_157951/))  
Assistant Professor; PhD, University of California, Berkeley

Rogers, Andrei  
Professor Emeritus

Schlosser, Sarah ([https://experts.colorado.edu/display/fisid\\_159679/](https://experts.colorado.edu/display/fisid_159679/))  
Teaching Associate Professor; MA, University of South Florida

Schoennagel, Tania ([https://experts.colorado.edu/display/fisid\\_139625/](https://experts.colorado.edu/display/fisid_139625/))  
Assistant Professor Adjunct

Serreze, Mark ([https://experts.colorado.edu/display/fisid\\_106334/](https://experts.colorado.edu/display/fisid_106334/))  
Distinguished Professor; PhD, University of Colorado Boulder

Travis, William R. ([https://experts.colorado.edu/display/fisid\\_101777/](https://experts.colorado.edu/display/fisid_101777/))  
Associate Professor; PhD, Clark University

Truelove, Yaffa Elane ([https://experts.colorado.edu/display/fisid\\_159271/](https://experts.colorado.edu/display/fisid_159271/))  
Assistant Professor; PhD, University of Cambridge (England)

Veblen, Thomas T. ([https://experts.colorado.edu/display/fisid\\_105842/](https://experts.colorado.edu/display/fisid_105842/))  
Distinguished Professor Emeritus; PhD, University of California, Berkeley

Yeh, Emily Ting ([https://experts.colorado.edu/display/fisid\\_130119/](https://experts.colorado.edu/display/fisid_130119/))  
Professor; PhD, University of California, Berkeley

## Courses

### **GEOG 1001 (4) Our Changing Planet: Climate and Vegetation**

Understanding our fragile planet and the life it harbors requires understanding how the distribution of the sun's energy at the surface, the atmosphere and its circulation, and the distribution of ocean and lands shape patterns of temperature, precipitation and vegetation across the globe. Along with providing a foundation for understanding planet Earth, this course addresses the growing impacts of human systems on climate change and environmental quality.

**Additional Information:** GT Pathways: GT-SC1 - Natural Physical Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Departmental Category: Physical Geography

MAPS Course: Natural Science Lab or Lab/Lec

MAPS Course: Natural Science

### **GEOG 1011 (4) Our Changing Planet: Landscapes and Water**

In many ways, the Earth is defined by its abundance of water and vigorous hydrologic cycle. This course introduces how floodplains and their associated river systems, river deltas, erosional features such as the Grand Canyon, depositional features such as Cape Cod and Long Island, as well as mountain and even desert landscapes reflect the great power of water in shaping our planet and impacting life on Earth.

**Additional Information:** GT Pathways: GT-SC1 - Natural Physical Sci:Lec Crse w/ Req Lab

Arts Sci Core Curr: Natural Science Sequence

Arts Sci Core Curr: Natural Science Lab

Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Departmental Category: Physical Geography

MAPS Course: Natural Science Lab or Lab/Lec

MAPS Course: Natural Science

**GEOG 1100 (3) Colorado Geographies: Environment, Society and Change in the Centennial State**

This course offers an introduction to the interdisciplinary field of geography through an exploration of Colorado. It covers Colorado's physical geography, including mountain orogeny, weather and climate, hydrology, and bioregions. It delves into the social forces that shape current realities in the state, exploring Indigenous geographies, political economy, urban development, and environmental justice. Students will deepen their knowledge of diverse people and environments in Colorado while gaining skills in map literacy and spatial visualization.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOG 1200 (3) Climate Change Geographies: Science, Impacts, and Action**

Climate change is one of the greatest challenges of our time, and this course introduces students to the fundamental concepts they need to understand the problems and contribute to solutions by integrating perspectives from physical, social, and spatial sciences. Students will review the scientific evidence for climate change, its impacts on human and environmental systems, and approaches to climate solutions via technology, policy, and social movements.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOG 1962 (3) Geographies of Global Change**

Familiarizes students with a geographic understanding of conflicts around the globe and of economic, political and cultural globalization. Analyzes the relationship between global forces, regions and local interests in contemporary territorial and geopolitical tensions and conflicts, emphasizing issues such as nationalism, migration, labor and natural resources. Formerly GEOG 2002.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Arts Sci Gen Ed: Diversity-Global Perspective

Departmental Category: Asia Content

MAPS Course: Geography

**GEOG 1972 (3) Sustainable Futures, Environment and Society**

Deepen your understanding of key global environmental issues, such as climate change, biodiversity loss, pollution, overconsumption, and environmental health hazards. We will discuss topics including conservation, water use, ethics, and environmental justice, and think about the relationship between politics, economy, culture and nature with case studies from around the globe.

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Environment-Society Geography

MAPS Course: Geography

**GEOG 1982 (3) Global Geographies: Societies, Places, Connections**

Introduces a comparative framework for recognizing and understanding the diversity of the world's societies and cultures. Units explore both local scale issues such as economic growth, inequality, political conflict, ethnic and racial dynamics, and climate change impacts, as well as broader scale trends associated with globalization, international development, migration, and the historical legacies of colonialism and imperialism.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Asia Content

MAPS Course: Geography

**GEOG 1992 (3) Human Geographies**

Examines social, political, economic, and cultural processes creating the geographical worlds in which we live, and how these spatial relationships shape our everyday lives. Studies urban growth, geopolitics, agricultural development and change, economic growth and decline, population dynamics, and migration exploring both how these processes work at global scale as well as shape geographies of particular places.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

MAPS Course: Geography

**GEOG 2001 (1-4) Topics in Physical Geography**

Examines various topics in physical geography that are not typically covered in the curriculum for lower division students; offered intermittently depending on student demand and availability of instructors.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOG 2053 (3) Mapping Our World**

Maps, geospatial data and technology play an important role in our understanding of the world and our geospatial literacy. Learn about the evolution of maps, the map as an art form, the map as a form of communication, and the ways maps influence our view of the world. Engage in critical thinking about maps and spatial data, and their use in society. In hands-on exercises students learn how to critically read and evaluate maps for expanding their spatial awareness of the world around them.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Techniques (Skills)

**GEOG 2092 (3) Advanced Introduction to Human Geography**

Provides a rigorous introduction to key analytical concepts of human geography - place, space, scale, regions, nature, landscapes and territory - while giving an overview of topics addressed in subfields including economic geography, political geography, cultural geography and development geography. Specific topics may vary slightly from semester to semester but will likely include borders and migration, maps, tourism, climate change and the Anthropocene, geopolitical conflict, development, urbanization, nationalism, gender, race, inequality and identity.

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

MAPS Course: Geography

**GEOG 2212 (3) Location, Location, Location: Introduction to Affordable Housing and Urban Development Geographies**

This course examines the geographies of housing affordability and urban development in the United States. Students will engage with course readings and assignments toward an understanding of spatial marginalization through housing exclusion. The contemporary affordable housing crisis will be discussed through the lens of politics, economic, and societal marginalization associated with race, gender, class, ability/disability, geographic location, and the ways in which places are shaped by housing policies at different scales.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**GEOG 2271 (3) Introduction to the Arctic Environment**

Rising temperatures, shrinking sea ice and melting glaciers are only the most visible indications of a rapidly changing Arctic. This course addresses the climate of the Arctic and the changes being observed at a non-mathematical level. It is intended to provide students with a basic understanding of the Arctic physical and biological environment as well as the impacts of Arctic change on human and environmental systems.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Departmental Category: Physical Geography

**GEOG 2321 (3) Geography of Skiing and Snowboarding**

Skiing and snowboarding (hereafter, skiing) are sports that lie at the convergence of diverse Earth science disciplines. Skiing is about the unique interaction between mountains, climate, the physics of glissading, technological innovation, and human expression. This course studies skiing through the lens of geographic inquiry, introducing students to the science of geography, by investigating the physical processes that govern mountain weather, snow properties, and the dynamics by which humans glissade over snow.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOG 2421 (3-4) Visualizing Climate Change and Extreme Weather Events**

Climate change is one of the most important and contentious issues impacting every aspect of our society. So what is climate change and who will it impact? This course will address the environmental and societal consequences and more. You will graph, map, and view satellite data to provide evidence of climate change around the world. In these efforts, you will be introduced to basic graphing, GIS, and remote sensing skills.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOG 2692 (3) Foundations in Public Health**

Get a comprehensive overview of public health as well as an in-depth introduction to specific public health-related topics. Beginning with a historical overview, students will explore major public health concepts such as the basic principles of epidemiology, the biomedical basis of disease, social and behavioral determinants of health, and systems thinking. Learn about the concepts of measuring and evaluating the health of populations, principles of communicable and non-communicable diseases, environmental and occupational health, the economics of health, and the role of public health workers in society.

**Equivalent - Duplicate Degree Credit Not Granted:** IPHY 2692 and PBHL 2692

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**GEOG 2852 (3) Contemporary Southeast Asia: Environmental Politics**

Examines globally pressing questions of environmental sustainability, regional inequality and development in the dynamic and heterogeneous landscapes of contemporary Southeast Asia. Focuses on interactions between histories of uneven development and contemporary debates over energy and infrastructure, food security, governance and access to land, forest and water-based resources.

**Equivalent - Duplicate Degree Credit Not Granted:** ASIA 2852

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment-Society Geography

**GEOG 3022 (3) Climate Politics and Policy**

Engages students in exploring the realm of contemporary and historical climate policy at three major levels of government: international, national and local/regional. Through course lectures, discussions, readings and activities, students will become conversant with the actors, mechanisms and concerns involved in climate policy and politics and develop their own sense of how to judge the success of climate policies. Fulfills intermediate social science requirement in Environmental Studies Major.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 3022

**Recommended:** Prerequisite ENVS 1000 or GEOG 1972.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment-Society Geography

**GEOG 3023 (4) Statistics and Geographic Data**

Learn how to use computational and statistical tools to solve problems in the geographic domain and apply introductory statistical concepts to real world problems through lab exercises. Using spatial data you will be trained in powerful specialized descriptive and predictive analysis technique. You will explore how to manipulate and visualize data and make inference using state-of-the art statistics software, applied to various social and Earth Science problems.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 3023

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Quantitative Reasoning Math  
Departmental Category: Techniques (Skills)

**GEOG 3053 (4) Geographic Information Science: Mapping**

Introduction to Geographic Information Systems (GIS) and the fundamentals of cartographic design. Learn about the science and art of map design in a GIS environment! Students will learn how to build a spatial database, implement best practice for processing various types of environmental and social spatial data and apply basic visual analytics to understand spatial patterns.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors).

**Recommended:** Prerequisite basic familiarity with computers and an introductory course in statistics (may be taken concurrently).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Techniques (Skills)

**GEOG 3251 (3) Mountain Geosystems**

Surveys mountain environments and their human use with illustrations from temperate and tropical mountain areas.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Physical Geography

**GEOG 3301 (3) Analysis of Climate and Weather Observations**

Discusses instruments, techniques and statistical methods used in atmospheric observations. Covers issues of data accuracy and analysis of weather maps. Provides application to temperature and precipitation records, weather forecasting and climate change trends. Uses computers to access data sets and process data.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 3300

**Requisites:** Requires prerequisite courses of APPM 1340 and 1345 or APPM 1350 or ECON 1088 or MATH 1081 or MATH 1300 or MATH 1310 and ATOC 1050 and ATOC 1060 or GEOG 3601 or ATOC 3600 or ENVS 3600 or GEOG 1011 (all minimum grade D-).

**Recommended:** Prerequisites ATOC 1050 or ATOC 1060 or ATOC 3600 or GEOG 3601 or ENVS 3600 or GEOG 1001 and one semester calculus.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 3351 (3) Biogeography**

Surveys and analyzes plant and animal distributions on a world scale from ecological and historical perspectives. Emphasizes human impact on species.

**Requisites:** Requires prerequisite course of GEOG 1001 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography



**GEOG 3402 (3) Natural Hazards**

Explores the impacts of extreme geophysical events on human society. Emphasizes adaptations to extreme events and ways of reducing vulnerability and damage.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment-Society Geography

**GEOG 3412 (3) Conservation Practice and Resource Management**

Studies policy and management of natural resources. Emphasizes practical approaches to the conservation and management of soil, land, water and air resources.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment-Society Geography

**GEOG 3422 (3) Political Ecology**

Political ecology is an influential approach to understanding society-environment relationships. Learn about issues including different philosophies of nature and wilderness, the politics of conservation, causes of environmental degradation, environmental conflict and indigenous ecological knowledge and understand their importance in our society.

**Recommended:** Prerequisite GEOG 1972.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment-Society Geography

**GEOG 3511 (4) The Water Cycle**

The pathway a raindrop or snowflake takes from the atmosphere to the stream determines water quality and quantity society relies on. This course examines the water cycle and its relationship with climate, vegetation, and soil. Learn how to work with quantitative analysis tools used by water managers during labs.

**Requisites:** Requires a prerequisite course of GEOG 1011 or GEOL 1010 or GEOL 1012 (minimum grade D-).

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 3601 (3) Principles of Climate**

Describes the basic components of the climate system: the atmosphere, ocean, cryosphere and lithosphere. Investigates the basic physical processes that determine climate and link the components of the climate system. Covers the hydrological cycle and its role in climate, climate stability and global change.

**Equivalent - Duplicate Degree Credit Not Granted:** ATOC 3600 and ENVS 3600

**Requisites:** Restricted to Geography (GEOG) or Environmental Studies (ENVS) majors or Atmospheric Oceanic Sciences (ATOC) minors only.

**Recommended:** Prerequisites one semester of calculus and ATOC 1060 or ATOC 3300 or GEOG 3301 or GEOG 1001.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 3612 (3) Reimagining Cities: Spaces of Power, Privilege, and Possibility**

Curious about what shapes your lifestyle, health, job opportunities, and how long you'll live? Your zip code! This course introduces the dynamics of American cities by investigating our country's built, social, and natural urban environments through a critical and applied lens. With engaging class exercises and independent local field trips, you'll explore how urban (re)development is a contested, socially and spatially uneven process. As a group, we will unpack how structural axes of power and privilege literally shape cities and create highly unequal opportunities for health, wellbeing, and opportunity. By the end of the course, students will be able to critically analyze urban spaces and apply insights to fields like urban planning, public health, social justice, and environmental sustainability. Whether pursuing further academic research or engaging in community-based work, students will gain practical skills in spatial analysis, policy evaluation, and the design of more equitable urban spaces.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-U.S. Perspective

**GEOG 3622 (3) Cities of the Global South**

Examines the geographies, processes, structural forces and everyday forms of urban life that are at the core of rapid urban transformation in the global South. Through using interdisciplinary scholarship, empirical case studies and key theoretical work, the course covers themes such as migration and urbanization, informality and governance, infrastructures of everyday life and urban environmental politics.

**Equivalent - Duplicate Degree Credit Not Granted:** IAFS 3670

**GEOG 3662 (3) Economic Geography**

Presents theories of the spatial organization of economic production, consumption and exchange systems. Geographical dynamics of industrialization, urbanization and economic growth. Examination of property, labor and social conflict, with a focus on political economy.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**GEOG 3672 (3) Who Runs the World? Sex, Power, and Gender in Geography**

This course will examine how gender and sexuality is constructed locally, nationally, and globally, drawing on conversations about feminist pasts, presents, and futures. We will focus on how gender intersects with race, class, sexuality, ability, religion, ethnicity, and geopolitical location to structure the lived experiences of women across the globe. We will apply critical geographic perspectives to gender inequality, exploring the overlaps and differences in women's and LGBTQ+ struggles as they are shaped by ongoing socio-cultural, political, and economic conditions globally.

**Equivalent - Duplicate Degree Credit Not Granted:** WGST 3672

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092 or WGST 2000 or WGST 2600.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Diversity-Global Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Human Geography

**GEOG 3682 (3) International Development: Economics, Power, and Place**

Learn about global economic and political inequalities through international development programs. Understand why some countries are in conditions of cyclical poverty while others experience massive economic growth and wealth. We will examine different approaches to economic development and critically consider existing and future planning.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Human Geography  
Departmental Category: Asia Content

**GEOG 3692 (4) Introduction to Global Public Health**

Introduces global health by putting its contemporary definition, determinants, development and direction as a field into a broad global context. The course is divided into four core topics: 1) the burden and distribution of disease and mortality; 2) the determinants of global health disparities; 3) the development of global health policies; and 4) the outcomes of global health interventions. Required for the Public Health Certificate.

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Human Geography

**GEOG 3742 (3) Place, Power, and Contemporary Culture**

Examines the relationship between places, power, and the dynamics of culture. Explores how the globalization of economics, politics, and culture shapes cultural change. Looks at how place-based cultural politics both assist and resist processes of globalization.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Core Curr: Contemporary Societies  
Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Diversity-Global Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Departmental Category: Human Geography

**GEOG 3782 (3) Environmentalism, Race, and Justice**

Examines spatial inequalities in environmental problems and their relationships to environmentalism and racism. Examines the implications for human health, well-being, and sense of place. Identifies factors that contribute to environmental inequalities, with particular attention to environmentalism and racism. Explores efforts to reduce environmental inequality, including by social movements, researchers, students, journalists, political leaders, and government agencies. Introduces students to research methods for documenting and analyzing environmental inequality. Focuses geographically on the United States. Formerly offered as a special topics course.

**Recommended:** Prerequisite GEOG 1972.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**GEOG 3812 (3) Mexico, Central America, and the Caribbean**

Introduces the geography of Latin America, focusing on the lands and peoples of Mexico, Central America, and the Caribbean. Examines regional and national culture, history, environment, and population, as well as ongoing environmental and socioeconomic changes.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Human Geography

**GEOG 3822 (3) China's Diverse Geographies: Environment, Society, Politics**

Get to know one of the world's most diverse countries, its physical and historical geography, urbanization and regional development, agriculture, population, energy, and the environment. Learn more about China and how to situate its development in a broader Asian and global context.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Core Curr: Human Diversity  
Arts Sci Gen Ed: Diversity-Global Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Human Geography  
Departmental Category: Asia Content

**GEOG 3832 (3) India and Its Neighbors: Societies, Economies, and Geopolitics**

Experience the diverse societies and cultures of India, Nepal, Afghanistan, Pakistan, Bangladesh, Sri Lanka, Bhutan, and the Maldives. Learn about the different belief systems, cultural practices, and environments in this region and how international relations and politics in this region influence global trade/economics, politics, conflict, and security.

**Recommended:** Prerequisites GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Human Geography  
Departmental Category: Asia Content

**GEOG 3840 (1-6) Undergraduate Independent Study**

Provides an independent study opportunity, by special arrangement with faculty, for students presenting strong geography preparation. Instructor consent required.

**Repeatable:** Repeatable for up to 8.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Geography (GEOG) majors only.

**GEOG 3842 (3) Human Geography of Czechia: Political, Economic and Social Transitions**

Excursions in Prague will begin with an understanding of Czech history through various imprints on the landscape, such as city planning, design, architecture and culture. This will be followed by a discussion of Prague in the 20th century and the various political, economic and social transitions. These transitions will be explored through field based study in and outside of Prague.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**GEOG 3862 (3) Global Africa: Environment, Development, and Culture**

What comes to mind when you think about Africa as a place and its connectedness to the rest of the world? Learn about the cultures, politics, economies, and ecologies of very specific places across the continent – from urban Nigeria to rural villages in Tanzania. Understand historic and present day flows of people, wealth, ideas, and more, to and from Africa to the rest of the world, from the slave trade, colonialism and wildlife conservation, to food, music and sports.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Human Geography

**GEOG 3882 (3) Geography of the Former Soviet Union**

Examines the contemporary social, political, population, cultural, ethnic and resource geography of the former Soviet Union. Relations between Russia and neighboring countries are also considered. Historical and physical geography are introduced as background to understanding post-Soviet developments and challenges.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**GEOG 3930 (3) Internship**

Provides an academically supervised opportunity for advanced geography or environmental studies majors to work in public and private organizations on projects related to the student's career goals and to relate classroom theory to practice. Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to Geography (GEOG) or Environmental Studies (ENVS) majors only.

**GEOG 4001 (1-4) Topics in Physical Geography**

Examines various topics in physical geography that are not typically covered in the curriculum. Offered intermittently depending on student demand and availability of instructors.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOG 4002 (1-4) Topics in Human and Environment/Society Geography**

Examines various topics in human and environment / society geography that are not typically covered in the curriculum. Offered intermittently depending on student demand and availability of instructors.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

**GEOG 4003 (1-4) Topics in Geographic Skills**

Examines various topics in geographical skills and techniques that are not typically covered in the curriculum. Offered intermittently depending on student demand and availability of instructors.

**Repeatable:** Repeatable for up to 12.00 total credit hours. Allows multiple enrollment in term.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

**GEOG 4023 (4) Advanced Quantitative Methods for Spatial Data**

Reviews fundamental statistical and quantitative modeling techniques and introduces more advanced statistical techniques widely used in geography today. Emphasizes geographic examples and spatial problems teaching hands-on skills in statistical programming. Topics covered include generalized linear models, spatial autocorrelation, spatial regression methods, and working with complex datasets.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5023

**Requisites:** Requires prerequisite course of GEOG 3023 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Methods

**GEOG 4043 (4) Advanced Geovisualization and Web Mapping**

Advanced technical course in web-based cartography and geovisualization stressing the important role digital cartography plays in cyberspace and society. Focuses on principles of effective cartographic design in multimedia and hypertext environments. Labs are organized around hands-on active learning projects demonstrating skills in geovisualization and cartographic practice.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5043

**Requisites:** Requires prerequisite course of GEOG 3053 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences

Arts Sci Gen Ed: Distribution-Social Sciences

Departmental Category: Methods

**GEOG 4093 (4) Remote Sensing of the Environment**

Covers acquisition and interpretation of environmental data by remote sensing. Discusses theory and sensors as well as manual and computerized interpretation methods. Stresses infrared and microwave portions of the spectrum.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5093 and GEOL 4093 and GEOL 5093

**Requisites:** Requires prerequisite course of APPM 1340 1345 or APPM 1350 or ECON 1088 or 3818 or MATH 1081 or 1300 or 1310 or 2510 or ANTH 4000 or BCOR 1020 or GEOG 3023 or GEOL 3023 or PSCI 2075 or PSYC 2111 or SOCY 2061 or 4061 or STAT 4000 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Departmental Category: Methods

**GEOG 4103 (4) Geographic Information Science: Spatial Analytics**

Explores advanced topics in geospatial databases, spatial analytics and geoprocessing in a Geographic Information System (GIS). Emphasizes how geographic concepts are linked to methodological frameworks for recording, transforming, storing/retrieving, analyzing, and processing geographic data as well as various forms of uncertainty. Exercises demonstrate the application of GIS-based methods to real world scenarios in interdisciplinary settings.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5103

**Requisites:** Requires prereq of (GEOG 3053 or GEOG 4603) and ANTH 4000 or APPM 4570 or BCOR 1020 or ECON 3818 or GEOG 3023 or GEOL 3023 or MATH 2510 or PSCI 2075 or PSYC 2111 or SOCY 2061 or SOCY 4061 (all min C-). Restrictd to students with 57-180 credits (Jun/ Sr).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab

Arts Sci Gen Ed: Distribution-Natural Sciences

Departmental Category: GIScience

**GEOG 4173 (3) Research Seminar**

Examines the nature of research and develops pregraduate skills for geographic research, emphasizing problem definition, methods, sources, data interpretation, and writing. Recommended for students pursuing honors.

**Requisites:** Restricted to students with 87-180 credits (Senior, Fifth Year Senior) Geography (GEOG) or Environmental Studies (ENVS) majors only.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Methods

**GEOG 4201 (3) Biometeorology**

Learn about the interactions between atmospheric processes and living organisms (plants, animals, and humans) through a meteorology/ biology lens. Topics include carbon and water cycling through vegetation, the energy and water balances in the system, and human temperature regulation to better understand how organisms adapt to a changing environment using a practical, problem-solving approach.

**Equivalent - Duplicate Degree Credit Not Granted:** ENVS 4201

**Requisites:** Prereq of GEOG 1001 any of (APPM 1340 1345) or APPM 1350 or ECON 1088 or 3818 or MATH 1081 or 1300 or 1310 or 2510 or ANTH 4000 or BCOR 1020 or GEOG 3023 or GEOL 3023 or PSCI 2075 or PSYC 2111 or SOCY 2061 or 4061 or STAT 4000 (min grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 4203 (4) Geographic Information Science: Spatial Modeling**

Focuses on the use and development of advanced models for human and environmental applications in a geospatial environment integrating raster and vector data models. Covers terrain and hydrologic modeling, geostatistical modeling, dasymetric modeling, as well as multi-criteria modeling. Group projects critically design, implement and test spatial models to develop independent skillsets in a chosen problem setting.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5203

**Requisites:** Requires prerequisite course of GEOG 4103 (minimum grade C-).

**Recommended:** Requisite working knowledge of GIS software.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: GIScience

**GEOG 4241 (4) Earth Surface Processes**

Earth's surface is constantly reshaped by water, ice, wind, and life.

This class investigates the earth's landscapes and the processes that modify them, both gradually by slow weathering and erosion, and abruptly through the action of floods, landslides, and other geologic events.

We cover surface processes in hillslope, glacial, riverine, desert, and coastal environments. Upon completion of the course, students will have mastered knowledge about diverse surface processes and landforms and applied core geomorphic principles to a variety of landscapes. Students will also learn that understanding surface processes is important for managing natural hazards (e.g., landslides and floods). This course will draw from many disciplines, including geology, geography, physics, chemistry, and biology. The laboratory portion of the course will include quantitative problem solving and field trips to collect and analyze geomorphic data.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOL 4241

**Requisites:** Requires prerequisite courses of GEOG 1011 or GEOL 2001 and a calculus course (MATH 1300 or APPM 1350 or (APPM 1340 and APPM 1345)), all minimum grade C-.

**Additional Information:** Arts Sci Core Curr: Natural Science Non-Sequence  
Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 4251 (3-4) River Systems and Landforms**

Rivers integrate the landscape, carrying water, sediment, and organic matter. Rivers also shape the landscape, eroding and depositing material. This course covers the physical (geomorphic) processes in river systems and the landforms that they create. Topics covered include drainage basin processes, river hydraulics, sediment transport, channel forms and patterns, interactions between ecological and geomorphic processes in rivers, and river restoration and management. The course will combine lectures, discussions, in-class activities, and field trips.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5251

**Requisites:** Requires prerequisite courses of GEOG 1011 and GEOG 3511 (minimum grade D-).

**Recommended:** Prerequisite GEOG 3023.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 4261 (3) Glaciers and Permafrost**

Surveys the major terrestrial components of the cryosphere, including permafrost, glaciers and ice sheets. Emphasizes physical processes involving ice, including thermal behavior, ice deformation and mass balance, but also considers biogeochemical processes and landforms associated with ice. The climate context, including human interactions and recent climate history, will be considered. Taught in a combination lecture-seminar format.

**Requisites:** Requires prerequisite course of GEOG 1011 or GEOL 1010 (minimum grade D-).

**Recommended:** Prerequisite GEOG 4241.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography



**GEOG 4271 (3) The Arctic Climate System**

Understanding the climate of the Arctic requires a synthetic, system oriented approach. The course focuses on the intimate linkages between the atmosphere, ocean and land that give the Arctic region its unique character, link the Arctic to the larger global climate system, and promote understanding the rapid changes occurring in the Arctic.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5271

**Requisites:** Requires prerequisite course of GEOG 1001 or ATOC 1050 or ATOC 1060 (minimum grade D-).

**Recommended:** Prerequisites GEOG 3511 or GEOG 3601 or ATOC 3600 or ENVS 3600 and statistics.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 4292 (3) Migration, Immigrant Adaptation, and Development**

Examines historical and current patterns of migration with an emphasis in international movement. Looks at leading migration theories related to both origin- and destination-based explanations while critically looking at the role of development as a potential cause and consequence of population movement. Finally, covers some aspects of immigrants' social and economic adaptation to their host society.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5292

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences  
Arts Sci Gen Ed: Diversity-U.S. Perspective  
Departmental Category: Human Geography

**GEOG 4303 (4) Geographic Information Science: Spatial Programming**

Focuses on the extension of geographic information systems (GIS) through programming as well as on the development of algorithms for spatial analysis and information extraction in vector and raster data using open source tools. Covers concepts, principles and techniques of programming and solving spatial problems in natural and social science settings. Group projects will foster skillsets in implementing solutions to complex spatial problems.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5303

**Requisites:** Requires prerequisite course of GEOG 4103 (minimum grade C-).

**Recommended:** Prerequisite GEOG 4203.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: GIScience

**GEOG 4311 (3) Watershed Biogeochemistry**

Emphasizes terrestrial-aquatic linkages in headwater catchments, focusing on hydrologic pathways, isotopic and geochemical tracers, nutrient cycling, water quality, experimental manipulations, and modeling.

**Requisites:** Requires prerequisite courses of GEOG 1011 and GEOG 3511 (minimum grade D-).

**Recommended:** Requisite parametric statistics.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 4321 (3-4) Snow Hydrology**

Offers a multidisciplinary and quantitative analysis of physico-chemical processes that operate in seasonally snow-covered areas, from the micro- to global-scale: snow accumulation, metamorphism, ablation, chemical properties, biological aspects, electromagnetic properties, remote sensing, GIS and quantitative methods.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5321

**Requisites:** Requires prerequisite course of APPM 1340 1345 or APPM 1350 or ECON 1088 or 3818 or MATH 1081 or 1300 or 1310 or 2510 or ANTH 4000 or BCOR 1020 or GEOG 3023 or GEOL 3023 or PSCI 2075 or PSYC 2111 or SOCY 2061 or 4061 or STAT 4000 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sci Lab  
Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 4331 (3-4) Mountain Climatology**

Surveys and analyzes climatic characteristics of mountain environments worldwide.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5331

**Requisites:** Requires prerequisite course of GEOG 1001 or ATOC 1050 or ATOC 1060 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 4371 (3) Forest Geography: Principles and Dynamics**

Surveys principles of forest geography and ecology. Includes both individual tree responses to environmental factors and species interactions within communities. Emphasizes forest dynamics and their relation to management problems.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5371

**Requisites:** Requires prerequisite course of GEOG 1001 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 4401 (3) Soils Geography**

Discusses chemical and physical properties of soils, soil development, distributions and management relevant to understanding plant-soil relationships in natural and human-altered landscapes.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5401

**Requisites:** Requires prerequisite course of GEOG 1011 (minimum grade D-).

**Recommended:** Prerequisite inorganic chemistry.

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Physical Geography

**GEOG 4403 (3) Geographic Information Science: Space Time Analytics**

Focuses on understanding processes (human, natural, social or physical) through data driven analysis of patterns in spatio-temporal data. Covers a wide range of topics relevant to space time data, including pattern analysis, modeling and visualization as well as time geography and various contemporary issues in space time analytics. Utilizes a hands-on, flipped classroom approach with in-class development of technical skills.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5403

**Requisites:** Requires a prerequisite course of GEOG 3023 or GEOG 4023 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: GIScience

**GEOG 4430 (3) Seminar: Conservation Trends**

Provides environmental studies or geography majors with an undergraduate format for interdisciplinary discussion and research into current and future directions of conservation.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment-Society Geography

**GEOG 4463 (3) Earth Analytics Data Science Bootcamp**

Learn key skills to automate data processing and visualization workflows that support both repeatable analysis and collaborative project approaches using scientific programming, version control and project management tools. Covers working with heterogeneous, large spatio-temporal data derived from space, airborne and ground based sensors and other sources. Gain applied experience through group projects that address real world problems.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5463

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Methods

**GEOG 4501 (3) Water Issues in the American West**

Water scarcity is a perpetual issue facing communities in the western United States. This course critically evaluates water use, emphasizing problems associated with geographic maldistribution, appropriations, irrigation, industry, pollution and regional development. Interprets and analyzes hydroclimatic data, surface and groundwater.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5501

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment-Society Geography

**GEOG 4503 (3) Geographic Information Science: Project Management**

Managing a geospatial project encompasses problem identification, project design, analysis and supporting team dynamics. The class mixes lectures and class exercises with student-selected projects and works through all stages of a project from articulating an initial idea to project planning and scoping, building a work plan, timeline and budget, executing the work plan and evaluating a project's progress.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5503

**Requisites:** Requires prerequisite course of GEOG 3053 or GEOG 4103 (minimum grade C-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: GIScience

**GEOG 4542 (3) Public Health Capstone Research Methods: Environmental Interventions to the Mental Health Epidemic**

This course will introduce students to interdisciplinary research methods in public health, with a focus on environmental interventions to address mental health. Robust data shows that spending time in nature can positively impact mental health. This course will teach students about the many phases of the scientific research process through doing; students will work in small groups to do their own research project throughout the semester on a pre-picked topic that can change from year to year.

**Equivalent - Duplicate Degree Credit Not Granted:** PBHL 4542 and PSYC 4542

**Requisites:** Prerequisites: Restricted to Public Health majors or those pursuing the Public Health certificate. Also, must have taken one of the following: ANTH 4000, ECON 3818, GEOG 3023, IPHY 3280, MATH 2510, PSCI 2075, PSYC 2111, SOCY 2061, STAT 2600.

**Recommended:** Prerequisite Students who are interested in taking this course but do not meet these requirements must have instructor approval.

**GEOG 4563 (3) Earth Analytics**

Introduce students to major unanswered questions in Earth science and to the analytical tools, including data management, analysis and visualization, necessary to explore 'big data' from a suite of sensors. Aligns with Earth Lab, a new initiative of the University's Grand Challenge (<http://www.colorado.edu/grandchallenges/>) to use our expertise in space-based observation to address our world's most pressing problems. Comparable programming course work may be substituted for GEOG 4463 with instructor approval.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5563

**Requisites:** Requires prerequisite course of GEOG 4463 (minimum grade C-).

**Grading Basis:** Letter Grade

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: Methods

**GEOG 4603 (3) GIS in the Social and Natural Sciences**

Introduces Geographic Information Systems and their underlying principles through interactive lectures and lab exercises. Students get basic skills for working in a GIS environment and learn how to handle and manage geospatial data, create maps and conduct geospatial analysis focusing on project tasks typically encountered in the social and natural sciences.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5603

**Additional Information:** Arts Sci Gen Ed: Distribution-Natural Sciences  
Departmental Category: GIScience

**GEOG 4622 (3) City Life**

Analyzes social, behavioral, political and demographic factors that influence development and maintenance of communities in contemporary urban environments, with primary emphasis on U.S. cities.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5622

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences

### **GEOG 4632 (3) Development Geography**

Provides an overview of development policy and practice, surveying foundational works in Development Studies as well as critical interventions. Required for Graduate Certificate in Development Studies.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5632

**Requisites:** Requires prerequisite course of GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 (minimum grade D-).

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092 (minimum grade D-).

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Human Geography

### **GEOG 4692 (3) Climate Change and Health**

Climate change is one of the great societal challenges of our times and it not only threatens the physical environment but also threatens human health. The course will explore the ways that climate change is affecting public health now and is projected to affect health in the future. We will also explore the public health implications, positive and negative, of efforts to respond to climate change through mitigation and adaptation. Formerly offered as a special topics course.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5692

### **GEOG 4712 (3) Political Geography**

Systematic study of relations between geography and politics, especially as background for better understanding of international affairs. Includes topics such as frontiers and boundaries, power analysis, geopolitics, international political economy, and strategic concepts.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5712

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092 or IAFS 1000 or PSCI 2012 or PSCI 2223.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Human Geography

### **GEOG 4722 (3) Field Methods in Human Geography**

Examines research methods associated with field work in human geography. Prepares students for fieldwork by focusing on geographic and interdisciplinary field work techniques; interpretation of field data; discussion of the politics, ethics and gender, race, class and cross-cultural issues related to field work.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5722

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Methods

### **GEOG 4732 (3) Population Geography**

Emphasizes spatial aspects of population characteristics including fertility, mortality, migration, distribution and composition. Includes both theoretical and empirical considerations, in addition to field work and computer simulations.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5732

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Human Geography

### **GEOG 4742 (3) Topics in Environment and Society**

Studies peoples and their environments, including human modification of nature and cultural interpretation and construction of rural and urban landscapes.

**Repeatable:** Repeatable for up to 6.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to students with 27-180 credits (Sophomores, Juniors or Seniors) only.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment-Society Geography

### **GEOG 4762 (3) Geographies of Political Islam**

Explores the postcolonial landscape of political Islam through the lens of political and cultural geography. Develops a critical anti-essentialist framework for understanding the political crisis of the Muslim world in relation to broader questions of empire, nationalism, democracy, revolution, security, terrorism, globalization and modernity. Focuses on the post-1979 period, several key Muslim nation-states (Saudi-Arabia, Egypt, Iran, Turkey, Pakistan) and movements (Taliban, ISIS).

**Recommended:** Prerequisite GEOG 1982 or GEOG 1992 or GEOG 2092 or GEOG 3742.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Human Geography

### **GEOG 4772 (3) Food and Power**

Analyzes people's relationships with food through lenses of power, justice, and sustainability. Topics covered include the political economy of global food systems, agroecology, agricultural technologies, alternative food movements, migration and labor politics, and influence of gender, race, class, and culture on food consumption. Draws on case studies from across the United States and around the globe.

**Recommended:** Prerequisites GEOG 1972 or GEOG 1982 or GEOG 2092.

### **GEOG 4812 (3) Political Ecology & Latin America**

Presents theoretical approaches to the links between environment and development in Latin America and focuses on analytical discussion of contemporary (and controversial) issues in sustainable development in Latin America. Examines social, ecological, economic, and political forces influencing the use of natural resources.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1982 or GEOG 1992 or GEOG 2092 or GEOG 3682 or GEOG 3422 or GEOG 3812 or ANTH 3110 or PSCI 3032.

**Additional Information:** Arts Sci Gen Ed: Diversity-Global Perspective  
Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment-Society Geography

### **GEOG 4822 (3) Environment and Development in China**

Examines key environmental problems in relation to China's rapid modernization and development.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1982 or GEOG 1992 or GEOG 2092 or HIST 1618.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Environment-Society Geography  
Departmental Category: Asia Content

**GEOG 4832 (3) Geography of Tibet**

Rigorously examines contemporary Tibetan society, culture and nature from a geographical perspective. Uses readings on contemporary Tibet as an entry point into scholarly research about nationalism, representation, diaspora, landscape and place, sustainable development, natural resource management, identity and environmentalism.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5832

**Recommended:** Prerequisite GEOG 3822 or other classes on China.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Asia Content

**GEOG 4842 (3) Global Frontiers in Southeast Asia**

Uses the theme of the global frontier to examine and compare three key moments in the modern history of Southeast Asia: the colonial encounter, the rise of the modern territorial state, and the age of contemporary globalization. Examines case studies from earlier eras to analyze emerging global frontiers at the junction of state territoriality and transnational economic expansion.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5842 and ASIA 4842

**Additional Information:** Arts Sci Gen Ed: Distribution-Arts Humanities  
Arts Sci Gen Ed: Distribution-Social Sciences

**GEOG 4852 (3) Health and Medical Geography**

Examines geographical patterns of health and disease with an emphasis on global health issues. Focuses on three major approaches to medical geographic research: ecological approaches, which systematically analyze relationships between people and their environments; social approaches, including political economy and socio-behavioral approaches; and spatial approaches, which employ maps and spatial analysis to identify patterns of health and disease. Elective course for Public Health Certificate.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 5852

**Requisites:** Restricted to students with 57-180 credits (Juniors or Seniors).

**Recommended:** Prerequisites GEOG 1001 or GEOG 1011 and GEOG 1962 or GEOG 1972 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Human Geography

**GEOG 4892 (3) Geography of Western Europe**

Provides a regional survey of cultural, political, economic, social, and physical geography of Western Europe, emphasizing the distinctive character and problems of each major area and the relationship of the region to the world.

**Recommended:** Prerequisite GEOG 1962 or GEOG 1972 or GEOG 1982 or GEOG 1992 or GEOG 2092.

**Additional Information:** Arts Sci Gen Ed: Distribution-Social Sciences  
Departmental Category: Human Geography

**GEOG 4990 (3) Senior Thesis**

Offers thesis research under faculty supervision. Instructor consent required.

**Repeatable:** Repeatable for up to 6.00 total credit hours.

**Requisites:** Restricted to students with 57-180 credits (Junior or Senior) Geography (GEOG) majors only.