

GEOGRAPHY (GEOG)

GEOG 5022 - Federal Data for Health Research & Policy (1-3 Credits)

Students will develop the knowledge and skills required to effectively use a variety of federal and statistical data sets for health research and policy analysis. Each week is devoted to one or two federal statistical datasets--data collection methods; why they are collected and what health issues they are designed to address; what population they represent and at what geographic scale. Most critically, students will be able to distinguish between questions that can be addressed with a public version of the data and questions that require restricted versions of the data that are protected by federal law and guidelines. Students will read, discuss and present research from various perspectives (Demography, Economics, Geography, Public Health, Sociology) using these data sources and apply their knowledge of data analysis from a variety of perspectives. Students will learn how to gain access to restricted data, how to protect individual anonymity with best practice disclosure avoidance techniques and will develop a research proposal for confidential research access.

Note: Familiarity with SAS (preferable) or other statistical software such as SPSS or Stata and statistics or data analysis is recommended. Restriction: Restricted to Graduate and Graduate Non-Degree Majors. Cross-listed with ECON 6022, HBSC 6022, and SOCY 5022. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to Graduate and Graduate Non-Degree Majors

GEOG 5050 - Applied Spatial Statistics (3 Credits)

Practice and application of spatial analytical and statistical methods using modern GIS and spatial statistical software. Topics include spatial data handling, interpolation, pattern analysis, cluster detection, visualization, and modeling. Prereq: Graduate standing and GEOG 4080 or GEOG 5080 or CVEN 5381 with a grade of B- or better. Note: an introductory course in statistics is strongly recommended for success in this course. Term offered: fall. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: Graduate standing and GEOG 4080 or GEOG 5080 or CVEN 5381 with a grade of B- or better.

Typically Offered: Fall.

GEOG 5060 - Remote Sensing I: Introduction to Environmental Remote Sensing (3 Credits)

An in-depth treatment of the use of aerial photographs and other forms of imagery for the analysis of urban-industrial patterns, vegetation, agriculture, landforms, and geologic structure. Cross-listed with GEOG 4060. Completion of GEOG 2080 with a C or better is recommended for optimal student success. Prereq: Graduate standing. Term offered: fall, spring, summer. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to Graduate and Graduate Non-Degree Majors

Typically Offered: Fall, Spring, Summer.

GEOG 5070 - Remote Sensing II: Advanced Remote Sensing (3 Credits)

Focuses on digital image processing of satellite and aerial images. Students explore the nature of digital image data, gain an understanding of image analysis using PCs, and learn about the use of analysis products in the development of GIS databases. Prereq: Graduate standing and GEOG 4060/5060 with a B- or better or permission of instructor. Cross-listed with GEOG 4070. Term offered: spring. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: Graduate standing and GEOG 4060/5060 with a B- or better.

Typically Offered: Spring.

GEOG 5080 - Introduction to GIS (3 Credits)

Introduces Geographic Information Systems (GIS), including justification, hardware/software, database design, and data conversion. GIS is a computer-based mapping system providing a graphical interface to locational and relational attribute data. Includes hands-on use of a GIS workstation. Cross-listed with GEOG 4080. Prereq: Graduate standing. Term offered: fall, spring, summer. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to Graduate and Graduate Non-Degree Majors

Typically Offered: Fall, Spring, Summer.

GEOG 5081 - Cartography (3 Credits)

Provides an introduction to the art and science of cartography (map making). Students will learn about design principles, tools and techniques of map production, culminating in the creation of a high-quality map through hands-on exercises. Prereq: Graduate standing and GEOG 4080 or GEOG 5080 or CVEN 5381 with a grade of C or better. Note: Completion of GEOG 2080 with a C or better is recommended for optimal student success. Cross-listed with GEOG 4081. Term offered: fall, spring. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: Graduate standing and GEOG 4080 or GEOG 5080 or CVEN 5381 with a grade of C or better

Typically Offered: Fall, Spring.

GEOG 5085 - GIS Applications for the Urban Environment (3 Credits)

Takes a more detailed look at basic concepts presented in the introductory GIS course, concentrating on how GIS is used to solve real-world geographic problems. Various GIS applications within both the natural and social sciences are highlighted. The selection of specific topics is flexible, based on the interests of enrolled students. Prereq: Graduate standing and GEOG 4080 or GEOG 5080 or CVEN 5381 with a grade of B- or better. Cross-listed with GEOG 4085. Term offered: spring. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: Graduate standing and GEOG 4080 or GEOG 5080 or CVEN 5381 with a grade of B- or better.

Typically Offered: Spring.

GEOG 5086 - FOSS4G Systems Integration (3 Credits)

Focuses on the integration of different FOSS4G (Free and Open Source Software for Geospatial Applications) software and technologies to create geospatial information systems that access data from different sources, storage structures, and formats to provide information to support decision making processes. Prereq: Graduate (including non-degree graduate) standing and GEOG 4091 or 5091, and GEOG 4092 or 5092 with a B- or higher. Cross-listed with GEOG 4086. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: Graduate (including non-degree graduate) standing and GEOG 4091 or 5091, and GEOG 4092 or 5092 with a B- or higher.

GEOG 5090 - Environmental Modeling with Geographic Information Systems (3 Credits)

Applies raster spatial analysis and modeling to study processes and spatial relationships to support decisionmaking in natural and built environments. Prereq: Graduate standing and GEOG 4080 or GEOG 5080 or CVEN 5381 with a grade of B- or better. Cross-listed with GEOG 4090. Term offered: fall. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: Graduate standing and GEOG 4080 or GEOG 5080 or CVEN 5381 with a grade of B- or better.

Typically Offered: Fall.

GEOG 5091 - Open Source Software for Geospatial Applications (3 Credits)

Students will master the individual use and integration of a stack of the most powerful Free and Open Source Software for Geospatial Applications (FOSS4G) to analyze spatial problems and create Spatial Data Infrastructures in different technological, socio-economic and organizational settings. Prereq: Graduate standing and GEOG 4080 or GEOG 5080 or CVEN 5381 with a grade of B- or better. Cross-listed with GEOG 4091. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: Graduate standing and GEOG 4080 or GEOG 5080 or CVEN 5381 with a grade of B- or better.

GEOG 5092 - GIS Programming and Automation (3 Credits)

Students will learn the most commonly used programming language to automate GIS geoprocessing tasks and workflows in the latest versions of the most popular GIS systems. Prereq: Graduate standing and GEOG 4080 or GEOG 5080 or CVEN 5381 with a grade of B- or better. Cross-listed with GEOG 4092. Term offered: fall. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: Graduate standing and GEOG 4080 or GEOG 5080 or CVEN 5381 with a grade of B- or better.

Typically Offered: Fall.

GEOG 5095 - Deploying GIS Functionality on the Web (3 Credits)

Covers the core principles and technologies that allow the deployment of geographic information system (GIS) functionality over the World Wide Web. Hands-on exercises make use of the latest commercial software as well as open source technologies. Prereq: Graduate standing and GEOG 4080 or GEOG 5080 or CVEN 5381 with a grade of B- or better. Cross-listed with GEOG 4095. Term offered: spring. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: Graduate standing and GEOG 4080 or GEOG 5080 or CVEN 5381 with a grade of B- or better.

Typically Offered: Spring.

GEOG 5150 - Place, Landscape, and Meaning (3 Credits)

Investigates the concepts of place, landscape, and their meanings. Incorporates theoretical and experiential perspectives to understand how socio-spatial interactions construct diverse identities and their implications for equity. Note: this course assumes that students have completed an introductory human geography course. Prereq: Graduate standing. Cross-listed with GEOG 4150. Term offered: fall. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to Graduate and Graduate Non-Degree Majors
Typically Offered: Fall.

GEOG 5220 - Environmental Impact Assessment (3 Credits)

The objective of this course is to provide the foundation for understanding the environmental impact assessment process, its legal context, and the criteria and methods for procedural and substantive compliance. Cross-listed with GEOG 4220, URPL 6549. Prereq: Graduate standing. Term offered: fall. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to Graduate and Graduate Non-Degree Majors
Typically Offered: Fall.

GEOG 5230 - Hazard Mitigation and Vulnerability Assessment (3 Credits)

Examines hazard mitigation and its planning and policy implications, emphasizing how vulnerability assessments play an integral role. Students explore how mitigation minimizes the impacts from hazards and use GIS to conduct a local study. Note: this course assumes that students have completed GEOG 2202 or equivalent. Prereq: Graduate standing. Cross-listed with GEOG 4230. Term offered: fall. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to Graduate and Graduate Non-Degree Majors
Typically Offered: Fall.

GEOG 5235 - GIS Applications in the Health Sciences (3 Credits)

Examines how GIS is used throughout the health care industry and public health. Covers environmental health, disease surveillance, and health services research. Students critically review current literature and gain hands-on experience with GIS software. Note: this course assumes that students have completed GEOG 4080 or GEOG 5080 and/or have a background in public health. Restriction: Restricted to Graduate and Graduate Non-Degree Majors. Cross-listed with GEOG 4235, HBSC 7235. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to Graduate and Graduate Non-Degree Majors

GEOG 5240 - Applied Geomorphology (3 Credits)

Uses hands-on tasks and field trips to investigate processes behind Earth's changing landforms in a variety of physical landscapes (aeolian, volcanic, coastal, fluvial, karst, glacial and periglacial) as related to rock decay, soils and climatic forcings. Note: this course assumes that students have completed GEOG 1202 or GEOL 1072 and GEOG 3232.

Prereq: Graduate standing. Cross-listed with GEOL 4240, 5240 and GEOG 4240. Term offered: fall. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to Graduate and Graduate Non-Degree Majors
Typically Offered: Fall.

GEOG 5251 - Fluvial Geomorphology (3 Credits)

Examines interactions between Earth's surface and flowing water across spatial and temporal scales. Considers structure and function of the major components of fluvial systems, with particular attention to the variety of fluvial systems to hydrologic, geologic and anthropogenic controls. Cross-listed with GEOG 4251, GEOL 4251 and GEOL 5251. Restriction: Restricted to Graduate and Graduate Non-Degree students. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to Graduate and Graduate Non-Degree Majors

GEOG 5265 - Sustainability in Resources Management (3 Credits)

Sustainability and sustainable development are the dominant economic, environmental and social issues of the 21st century. Follows a multi-disciplinary approach to these concepts. Case studies demonstrate their implementation in different geographical, ecological and socio-economic conditions worldwide. Note: this course assumes that students have completed ENVS 1042 or equivalent. Prereq: Graduate standing. Cross-listed with GEOG 4265. Repeatable. Max Hours: 6 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 6.

Restriction: Restricted to Graduate and Graduate Non-Degree Majors

GEOG 5270 - Glacial Geomorphology (3 Credits)

Provides an in-depth view of the processes and systems found in glacial environments. Topics include: evidence of past glaciation; present-day glacial extent; glacier dynamics; glacial erosional processes and landforms; glacial depositional processes and landforms. Note: this course assumes that students have completed GEOG 1202 or GEOL 1072 or equivalent. Prereq: Graduate standing. Cross-listed with GEOG 4270, GEOL 4270 and GEOL 5270. Term offered: fall. Max hours: 3 Credits. Grading Basis: Letter Grade
Restriction: Restricted to Graduate and Graduate Non-Degree Majors
Typically Offered: Fall.

GEOG 5300 - Children's Geographies (3 Credits)

This seminar is an investigation of children, childhood, and environment from geographical perspectives. Theoretical and methodological lenses are used to understand young people's interactions with/in different spaces. Cross-listed with ENVS 5300. Restriction: Restricted to Graduate and Graduate Non-Degree majors. Term offered: spring. Max hours: 3 Credits. Grading Basis: Letter Grade
Restriction: Restricted to Graduate and Graduate Non-Degree Majors
Typically Offered: Spring.

GEOG 5335 - Climate Change & Society (3 Credits)

Our focus in this class is to critically examine and engage with important and ongoing environmental issues, with particular emphasis on those related to climate change. Together we will explore issues ranging from deforestation and sea level rise to climate justice, paying attention not only to their societal drivers and impacts, but to the dynamics of power and authority that affect how these issues come to be studied, represented, addressed, and experienced. The goal of this course is less to build topical expertise in any single domain than it is to broaden and deepen your capacity to engage with, participate in, and critically dissect climate-society relations. Cross-listed with GEOG 4335. Prereq: Graduate standing. Term offered: spring. Max hours: 3 Credits. Grading Basis: Letter Grade
Restriction: Restricted to Graduate and Graduate Non-Degree Majors
Typically Offered: Spring.

GEOG 5350 - Environment and Society in the American Past (3 Credits)

Overview of the geographical development of North American society from the late 15th century to the mid-20th century. A comparative regional approach emphasizing relationships between natural resource exploitation, cultural landscape formation and environmental change. Cross-listed with GEOG 4350. Prereq: Graduate standing. Term offered: fall. Max Hours: 3 Credits. Grading Basis: Letter Grade
Restriction: Restricted to Graduate and Graduate Non-Degree Majors
Typically Offered: Fall.

GEOG 5420 - The Politics of Nature (3 Credits)

"Examines how economic systems, scientific discovery, institutional policies, and environmental knowledge converge to shape the environment and mediate the way societies understand, manage and respond to environmental changes in both the United States and the developing world. Cross-listed with GEOG 4420. Restriction: Restricted to Graduate and Graduate Non-Degree Majors. Max hours: 3 Credits." Grading Basis: Letter Grade
Restriction: Restricted to Graduate and Graduate Non-Degree Majors

GEOG 5440 - Science, Policy and the Environment (3 Credits)

Examines the social, economic and political forces shaping scientific discovery and the development and enforcement of environmental policy. Students will examine perspectives on issues such as risk, expertise, uncertainty and objectivity that influence the problem-defining, standard-setting and policy-making process. Cross-listed with GEOG 4440. Prereq: Graduate standing. Term offered: fall. Max hours: 3 Credits. Grading Basis: Letter Grade
Restriction: Restricted to Graduate and Graduate Non-Degree Majors
Typically Offered: Fall.

GEOG 5640 - Urban Geography: Denver and the U.S. (3 Credits)

Uses a combined lecture/seminar format to explore research themes in urban geography. Topics covered include both historical and contemporary processes of urban development and transformation. Particular emphasis is placed on the U.S. and Colorado's Front Range. Cross-listed with GEOG 4640. Prereq: Graduate standing. Term offered: spring. Max hours: 3 Credits. Grading Basis: Letter Grade
Restriction: Restricted to Graduate and Graduate Non-Degree Majors
Typically Offered: Spring.

GEOG 5680 - Urban Sustainability and Resiliency: Perspectives and Practice (3 Credits)

Society is facing an uncertain future. Our cities are growing, and anthropogenic climate change is upon us, and cities are a significant contributors towards this "wicked problem". We cannot turn back the clock, but our cities can become more resilient and, as a result, more sustainable. The course will focus on the techniques used to address resiliency and sustainability through planning, greening and eco-city, physical, ecological, social, environmental justices, and management approaches. Cross-listed with GEOG 4680. Prereq: Graduate standing. Term offered: fall. Max hours: 3 Credits. Grading Basis: Letter Grade
Restriction: Restricted to Graduate and Graduate Non-Degree Majors
Typically Offered: Fall.

GEOG 5710 - Disasters, Climate Change, and Health (3 Credits)

Provides a review of the impacts of disasters and climate change on human health, using a broad framework of preparedness, mitigation, response, recovery, and adaptation. Note: this course assumes that students have completed GEOG 2202 or GEOG 3501. Prereq: Graduate standing. Max hours: 3 Credits. Grading Basis: Letter Grade
Restriction: Restricted to Graduate and Graduate Non-Degree Majors

GEOG 5720 - Climate Change: Causes, Impacts and Solutions (3 Credits)

Examines science behind past, present & future climate change & environmental, social & political implications & solutions. Explores recent scientific research, syntheses & mainstream literature advancing knowledge about causes & consequences of natural & anthropogenic climate change. Cross-listed with GEOG 4720/ ENVS 4720/ ENVS 5720. Prereq: Graduate standing. Max hours: 3 Credits. Grading Basis: Letter Grade
Restriction: Restricted to Graduate and Graduate Non-Degree Majors

GEOG 5740 - Soil Science and Geography (3 Credits)

Reviews chemical and physical properties of soils, soil development, and geographic distributions of soil types in the context of the role that soils play in natural and human-altered ecosystems. Prereq: graduate standing or permission of instructor. Cross-listed with GEOG 4740, ENVS 4740, ENVS 5740. Term offered: fall. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to Graduate and Graduate Non-Degree Majors
Typically Offered: Fall.

GEOG 5750 - Beeography: Geography of Bees (4 Credits)

Beeography is an introduction to the bee world and the amazing diversity in Colorado and beyond. The course will examine the distribution of bees and the pressures they face in different environmental and cultural contexts. It will examine different methods to support and increase bee populations and pollination services, especially in populated environments, including backyard beekeeping of honeybee and native bee populations. Field and lab activities will include beekeeping, native bee collection and identification, bee dissections, pollen processing and identification, and trips to area bee museum collections and apiaries.

Restriction: Restricted to Graduate and Graduate Non-Degree Majors.

Cross-listed with GEOG 4750, ENVS 4750, and ENVS 5750. Term offered: spring. Max hours: 4 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to Graduate and Graduate Non-Degree Majors
Typically Offered: Spring.

GEOG 5757 - Urban Climate and Air Quality (3 Credits)

Explores how people alter climates on micro- to regional scales, and how this in turn affects human health and society. Focuses on recent scientific research, physical processes within cities, and the role of urbanization in global climate change. Restriction: Restricted to Graduate and Graduate Non-Degree Majors. Cross-listed with ENVS 5757. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to Graduate and Graduate Non-Degree Majors
Typically Offered: Fall.

GEOG 5840 - Independent Study (1-3 Credits)

Section 1, economic; 2, physical; 3, urban; 4, social; 5, quantitative; 6, transportation. Note: Students must submit a special processing form completely filled out and signed by the student and faculty member, describing the course expectations, assignments and outcomes, to the CLAS Graduate Academic Services Coordinator for approval. Department consent required. Repeatable. Max hours: 3 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 3.

GEOG 5880 - Directed Research (1-6 Credits)

Students will engage in original research projects supervised and mentored by faculty. Students must work with faculty prior to registration to develop a proposal for their project and receive permission to take this course. Note: Students must submit a special processing form completely filled out and signed by the student and faculty member, describing the course expectations, assignments and outcomes, to the CLAS Graduate Academic Services Coordinator for approval. Repeatable. Max Hours: 6 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 6.

GEOG 5939 - Internship (1-6 Credits)

Note: Students must submit a special processing form completely filled out and signed by the student and faculty member, describing the course expectations, assignments and outcomes, to the CLAS Graduate Academic Services Coordinator for approval. Department consent required. Repeatable. Max Hours: 9 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 9.

GEOG 5990 - Special Topics In Geography (1-6 Credits)

Course content varies from semester to semester, depending on faculty member teaching the course. Prereq: Graduate standing. Repeatable. Max hours: 6 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 6.

Restriction: Restricted to Graduate and Graduate Non-Degree Majors

GEOG 5995 - Global Study Topics (3-9 Credits)

This course is reserved for CU Denver faculty-led study abroad experiences. The course topic will vary based on the location and course content. Students register through the Office of Global Education.

Restriction: Restricted to Graduate and Graduate Non-Degree majors.

Cross-listed with ENVS 4995, ENVS 5995, and GEOG 4995. Max hours: 12 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 12.

Restriction: Restricted to Graduate and Graduate Non-Degree Majors

Additional Information: Global Education Study Abroad.

GEOG 6300 - Foundations Seminar in Human-Environmental Interaction (3 Credits)

This seminar allows students to gain a deeper appreciation for historical and contemporary geographical approaches to understanding the relationship between society and the environment through a survey review of seminal concepts, theories and debates that have shaped the discipline. Prereq: Graduate standing. Term offered: fall. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to Graduate and Graduate Non-Degree Majors

Typically Offered: Fall.

GEOG 6700 - Integrated Methods (3 Credits)

Geographers employ a variety of quantitative and qualitative methods in their research. The course presents these methods as a continuum, rather than separate typologies, and reviews the difference between integrated and mixed methods. Students will evaluate how and when to apply various methods to most appropriately elicit data. Prereq: Graduate standing. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to Graduate and Graduate Non-Degree Majors

GEOG 6750 - Research Design (3 Credits)

Reviews research framework common to all geographers. Reviews the key steps in designing and executing high-caliber independent research, including topic selection, literature review and data collection analysis. Students will develop competence in applying relevant theories from the natural and social sciences through projects. Prereq: Graduate standing. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to Graduate and Graduate Non-Degree Majors

GEOG 6800 - Community-Based Research Practicum (4 Credits)

For students to apply the concepts and skills presented throughout the masters program in a community setting. Students will participate in a real-world, studio-based project that meets the needs of a government, non-governmental, or private sector organization and will produce a scoped product. Prereq: GEOG 6300 with a B- or higher. Cross-listed with ENVS 6800. Term offered: spring. Max hours: 4 Credits.

Grading Basis: Letter Grade

Prereq: GEOG 6300 with a B- or higher.

Typically Offered: Spring.

GEOG 6840 - Independent Study: GEOG (1-3 Credits)

Independent research for graduate major students. Note: Students must submit a special processing form completely filled out and signed by the student and faculty member, describing the course expectations, assignments and outcomes, to the CLAS Graduate Academic Services Coordinator for approval. Prereq: Permission of department. Max hours: 3 Credits.

Grading Basis: Letter Grade

GEOG 6950 - Master's Thesis (1-6 Credits)

Department consent required. Note: Students must submit a special processing form completely filled out and signed by the student and faculty member, describing the course expectations, assignments and outcomes, to the CLAS Graduate Academic Services Coordinator for approval. Prereq: Graduate standing. Repeatable. Max hours: 6 Credits.

Grading Basis: Letter Grade with IP

Repeatable. Max Credits: 6.

Restriction: Restricted to Graduate and Graduate Non-Degree Majors

Additional Information: Report as Full Time.

GEOG 8990 - Doctor's Thesis (1-8 Credits)

Department consent required. Note: Students must submit a special processing form completely filled out and signed by the student and faculty member, describing the course expectations, assignments and outcomes, to the CLAS Graduate Academic Services Coordinator for approval. Prereq: Graduate standing. Repeatable. Max hours: 8 Credits.

Grading Basis: Letter Grade with IP

Repeatable. Max Credits: 8.

Restriction: Restricted to Graduate and Graduate Non-Degree Majors

Additional Information: Report as Full Time.