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 data sets—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 students with graduate standing or permission of graduate advisor/instructor. Cross-listed with ECON 6022, HBSC 6022, and SOCY 5022. Max hours: 3 Credits.
Grading Basis: Letter Grade
Restriction: Restricted to students with graduate standing or permission of graduate advisor/instructor.

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 C or better. Note: an introductory course in statistics is strongly recommended for success in this course. 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

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 or permission of instructor. Cross-listed with GEOG 4070. Max hours: 3 Credits.
Grading Basis: Letter Grade
Prereq: Graduate standing and GEOG 4060/5060
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<tr>
<th>Course Code</th>
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<td>Open Source Software for Geospatial Applications</td>
<td>3</td>
<td>Restricted to Graduate and Graduate Non-Degree Majors</td>
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<td>GEOG 5092</td>
<td>GIS Programming and Automation</td>
<td>3</td>
<td>Graduate standing and GEOG 4080 or GEOG 5080 or CVEN 5381 with a grade of C or better</td>
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<td>GEOG 5095</td>
<td>Deploying GIS Functionality on the Web</td>
<td>3</td>
<td>Graduate standing and GEOG 4080 or GEOG 5080 or CVEN 5381 with a grade of C or better</td>
<td>Letter Grade</td>
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<td>GEOG 5150</td>
<td>Place, Landscape, and Meaning</td>
<td>3</td>
<td>Restricted to Graduate and Graduate Non-Degree Majors</td>
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<td>GEOG 5220</td>
<td>Environmental Impact Assessment</td>
<td>3</td>
<td>Graduate standing and GEOG 4080 or GEOG 5080 or CVEN 5381 with a grade of C or better</td>
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<td>GEOG 5230</td>
<td>Hazard Mitigation and Vulnerability Assessment</td>
<td>3</td>
<td>Graduate standing and GEOG 4080 or GEOG 5080 or CVEN 5381 with a grade of C or better</td>
<td>Letter Grade</td>
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<td>GEOG 5235</td>
<td>GIS Applications in the Health Sciences</td>
<td>3</td>
<td>Graduate standing and GEOG 4080 or GEOG 5080 or CVEN 5381 with a grade of C or better</td>
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<td>GEOG 5240</td>
<td>Applied Geomorphology</td>
<td>3</td>
<td>Grading Basis: Letter Grade</td>
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<td>GEOG 5251</td>
<td>Fluvial Geomorphology</td>
<td>3</td>
<td>Restriction: Restricted to Graduate and Graduate Non-Degree Majors</td>
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<td>GEOG 5259</td>
<td>Sustainability in Resources Management</td>
<td>3</td>
<td>Restriction: Restricted to Graduate and Graduate Non-Degree Majors</td>
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<td>GEOG 5270</td>
<td>Glacial Geomorphology</td>
<td>3</td>
<td>Restriction: Restricted to Graduate and Graduate Non-Degree Majors</td>
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<td>GEOG 5300</td>
<td>Children's Geographies</td>
<td>3</td>
<td>Restricted to Graduate and Graduate Non-Degree majors. Term offered: spring.</td>
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<td>Typically Offered: Spring.</td>
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GEOG 5335 - Contemporary Environmental Issues (3 Credits)
Provides an overview of environmental challenges facing society today, focusing on how humans impact and change the environment. Opposing views and environmental policy at the local, state, national, and international levels are explored. Cross-listed with GEOG 4335. Prereq: Graduate standing. Max hours: 3 Credits.
Grading Basis: Letter Grade
Restriction: Restricted to Graduate and Graduate Non-Degree Majors

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. Max Hours: 3 Credits.
Grading Basis: Letter Grade
Restriction: Restricted to Graduate and Graduate Non-Degree Majors

GEOG 5380 - Anthropocene Futures (3 Credits)
We are living in the "Anthropocene"—an era of rapid environmental and societal changes, and of decline and loss resulting from accelerating human interactions with Earth systems. Warming climates, wildfires, floods, water and food insecurity, novel ecosystems, and even pandemics such as COVID-19, are phenomena of the Anthropocene. With a still growing human population and a finite planet, understanding and overcoming such challenges is more pressing than ever, if people are to co-evolve with Earth toward a sustainable future. This interdisciplinary seminar course tells the scientific story of humanity's intensifying interactions with the planet and explores possible future paths. Through presentations, readings and discussion, students will examine topics that include the origin and significance of Anthropocene in Earth's evolutionary history, the debates and evidences for a new geologic epoch, large-scale trajectories of environmental change, a safe operating space, and planting seeds for a "good" Anthropocene. In doing so, students will acquire skills and experiences in critical thinking and analytical reasoning to grapple with many uncertainties and tensions of the Anthropocene.
Restriction: Restricted to Graduate and Graduate Non-Degree Majors.
Cross-listed with GEOG 4380, ENVS 4380, and ENVS 5380. Max hours: 3 Credits.
Grading Basis: Letter Grade
Restriction: Restricted to Graduate and Graduate Non-Degree Majors

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. Prereq: Graduate standing. 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. Max hours: 3 Credits.
Grading Basis: Letter Grade
Restriction: Restricted to Graduate and Graduate Non-Degree Majors

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. Max hours: 3 Credits.
Grading Basis: Letter Grade
Restriction: Restricted to Graduate and Graduate Non-Degree Majors

GEOG 5680 - Urban Sustainability: Perspectives and Practice (3 Credits)
Examines various perspectives on sustainability, including ambiguities and opportunities of sustainability as a conceptual framework. Class also examines what sustainability looks like in practice, using numerous topics such as poverty and urban farming to water and climate change. Cross-listed with GEOG 4680. 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. Max hours: 3 Credits.
Grading Basis: Letter Grade
Restriction: Restricted to Graduate and Graduate Non-Degree Majors

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. Max hours: 4 Credits.
Grading Basis: Letter Grade
Restriction: Restricted to Graduate and Graduate Non-Degree Majors
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. Focusses on recent scientific research, physical processes within cities, and the role of urbanization in global climate change. Prereq: GEOG 3232 with a C- or higher. Cross-listed with ENVS 5757. Max hours: 3 Credits.
Grading Basis: Letter Grade
Prereq: GEOG 3232 with a C- or higher.
Typically Offered: Fall.

GEOG 5840 - Independent Study (1-3 Credits)
Section 1, economic; 2, physical; 3, urban; 4, social; 5, quantitative; 6, transportation. Department consent required. Repeatable. Max hours: 3 Credits.
Grading Basis: Letter Grade

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. Repeatable. Max Hours: 6 Credits.
Grading Basis: Letter Grade

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 Graduate School for approval. Department consent required. Repeatable. Max Hours: 9 Credits.
Grading Basis: Letter Grade
Repeatable. Max Credits: 3.

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

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.

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. Max hours: 3 Credits.
Grading Basis: Letter Grade
Restriction: Restricted to Graduate and Graduate Non-Degree Majors

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

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

GEOG 6840 - 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 C or higher. Cross-list ENVS 6800. Max hours: 4 Credits.
Grading Basis: Letter Grade

GEOG 6950 - Master's Thesis (1-6 Credits)
Prereq: Graduate standing. Department consent required. Repeatable. Max hours: 6 Credits.
Grading Basis: Letter Grade with IP

GEOG 6990 - Doctor's Thesis (1-8 Credits)
Prereq: Graduate standing. Department consent required. Repeatable. Max hours: 8 Credits.
Grading Basis: Letter Grade with IP
Repeatable. Max Credits: 8.

GEOG 8990 - Doctor's Thesis (1-8 Credits)
Prereq: Graduate standing. Department consent required. Repeatable. Max hours: 8 Credits.
Grading Basis: Letter Grade with IP
Repeatable. Max Credits: 8.