

# GEOGRAPHY AND ENVIRONMENTAL SCIENCES

**Chair:** Peter Anthamatten, PhD  
**Program Assistant:** Sue Eddleman  
**Administrative Assistant:** Meron Ayele  
**Office:** North Classroom, 3016  
**Telephone:** 303-315-7525  
**Fax:** 303-315-7526

## Overview Undergraduate Information

Geography is a science that focuses on the spatial analysis of human/physical patterns and processes. Geographers attempt to identify the factors affecting the distribution of people and their activities on the surface of the earth and to provide meaningful solutions to problems faced by societies. This discipline is an ideal major for the liberal arts student, providing exposure to the concepts and techniques utilized in investigating the physical sciences, environmental and sustainability issues, socioeconomic problems and planning policies. The major offers 4 degree options:

1. General Geography
2. Environmental Science
3. Environment, Society & Sustainability
4. Urban Studies & Planning

The program offers a distinctive curriculum that combines a broad and integrative scientific education with state-of-the-art training in geo-spatial analysis (e.g., computer mapping, GIS, remote sensing). The program is designed to provide the student interested in physical, social or environmental geography with the background necessary for obtaining a rewarding career in government (federal, state, local) or private industry, as well as preparing students for graduate study.

## Departmental Honors

Departmental honors is a privilege for students who demonstrate exceptional academic performance and promise at CU Denver. The minimum criteria for honors in GES are an overall GPA of 3.3 in all courses at CU Denver (minimum of 30 semester hours for transfer students) and a GPA of 3.75 for all courses taken in the Department of Geography and Environmental Sciences (regardless of the BA option that students are pursuing). A student who meets these criteria shall work with a GES faculty sponsor who agrees to guide an honors thesis. Students must successfully complete and defend an honors thesis that demonstrates independent research, written and presentation skills. Additionally, students are required to sign up for and successfully complete 3 honors thesis credits the semester that they are graduating with honors. Departmental honors will be awarded based on successful completion and defense of the honors thesis, subject to faculty sponsor and committee approval. For more information, please contact the GES undergraduate advisor and/or chair.

## Graduate Information

Please go to the **Graduate** catalog to read about our graduate programs.

## Programs

- Geography, BA (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-liberal-arts-sciences/geography-environmental-sciences/geography-ba/>)
- Geography - Environment, Society and Sustainability Option, BA (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-liberal-arts-sciences/geography-environmental-sciences/geography-environment-society-sustainability-option-ba/>)
- Geography - Environmental Science Option, BA ([http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-liberal-arts-sciences/geography-environmental-science-option-ba/](http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-liberal-arts-sciences/geography-environmental-sciences/geography-environmental-science-option-ba/))
- Geography - Urban Studies and Planning, BA ([http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-liberal-arts-sciences/geography-urban-studies-planning-ba/](http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-liberal-arts-sciences/geography-environmental-sciences/geography-urban-studies-planning-ba/))
- Environmental Sciences Minor (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-liberal-arts-sciences/geography-environmental-sciences/environmental-sciences-minor/>)
- Geography Minor (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-liberal-arts-sciences/geography-environmental-sciences/geography-minor/>)
- Urban and Regional Planning Minor (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-liberal-arts-sciences/geography-environmental-sciences/urban-regional-planning-minor/>)
- Geographic Information Science Undergraduate Certificate (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-liberal-arts-sciences/geography-environmental-sciences/geographic-information-science-undergraduate-certificate/>)
- Sustainable Urban Agriculture Undergraduate Certificate (<http://catalog.ucdenver.edu/cu-denver/undergraduate/schools-colleges-departments/college-liberal-arts-sciences/geography-environmental-sciences/sustainable-urban-agriculture-undergraduate-certificate/>)

## Faculty

### Professors:

**Anne Chin**, PhD, Arizona State University  
**Pamela Jansma**, PhD, Northwestern University (CLAS Dean)

### Professors Emeritus:

**Rudi Hartmann**, PhD, Technical University of Munich  
**Wesley E. LeMasurier**, PhD, Stanford University  
**Martin Lockley**, PhD, University of Birmingham, England  
**John W. Wyckoff**, PhD, University of Utah

### Associate Professors:

**Peter Anthamatten**, PhD, University of Minnesota  
**Christy Briles**, PhD, University of Oregon  
**Frederick B. Chambers**, PhD, Arizona State University  
**Rafael Moreno-Sanchez**, PhD, Colorado State University  
**Brian Page**, PhD, University of California, Berkeley  
**Gregory Simon**, PhD, University of Washington  
**Bryan S. Wee**, PhD, Purdue University

### Assistant Professors:

**Benjamin Crawford**, PhD, University of British Columbia, Vancouver  
**Katharine Kelsey**, PhD, University of Colorado Boulder  
**Lisa Kelley**, PhD, University of California Berkeley

### Associate Professors Clinical Teaching Track:

**Matthew Cross**, Ph.D, University of Colorado Denver

### Assistant Professors Clinical Teaching Track:

**Thomas Duster**, PhD, University of Notre Dame

### Senior Instructors:

**Amanda Weaver**, PhD, University of Denver

### Instructors:

**Kirsten Christensen**, MSS, MURP, University of Colorado Denver  
**Yi-Chia Chen**, PhD, Louisiana State University

### Lecturers:

**Richard Ashmore**  
**Tim Connors**  
**Hope Dalton**  
**Richard DeGrandchamp**  
**Amy DePierre**  
**James Fleming**  
**David Murray**  
**Mandy Rees**

## Geography (GEOG)

**GEOG 1102 - World Regions Global Context (3 Credits)**  
Analyzes world regions and their global interconnectedness, including the dynamic and complex relationships between people and the world they inhabit. Demographic and cultural (political, economic, and historic) issues are examined as well as interactions between human societies and natural environments. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Term offered: fall, spring, summer. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SS2.  
Grading Basis: Letter Grade  
Additional Information: Denver Core Requirement, Social Sciences; GT courses GT Pathways, GT-SS2, Soc Behav Sci: Geography.

**GEOG 1111 - First Year Seminar (3 Credits)**  
Restriction: Restricted to Freshman level students. Max hours: 3 Credits.  
Grading Basis: Letter Grade  
Restriction: Restricted to Freshman level students

**GEOG 1202 - Introduction to Physical Geography (3 Credits)**  
The science that studies the processes, forms, and spatial or geographic structures of natural systems operating at or near the earth's surface, including weather, climate, and landform processes. Term offered: fall, spring, summer. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SC2.  
Grading Basis: Letter Grade  
Additional Information: Denver Core Requirement, Biol Phys Sci - No Lab; GT courses GT Pathways, GT-SC2, Nat Phy Sci:Lec w/o Req Lab.

**GEOG 1302 - Introduction to Human Geography (3 Credits)**  
Systematic introduction to basic concepts and approaches in human geographic analysis. Term offered: fall, spring. Max hours: 3 Credits.  
Grading Basis: Letter Grade  
Additional Information: GT courses GT Pathways, GT-SS2, Soc Behav Sci: Geography.

**GEOG 1332 - Topics in Science (1 Credit)**  
A series of five-week modules on various topics in physical geography. Section 001. Violent Storms. Analysis of the causes, characteristics, and regional patterns of thunderstorms, tornadoes and hurricanes, emphasizing the hazards associated with each type of storm. Section 002. Elementary Surveying. Introduces the various techniques of running a traverse, location of points by intersection and resection, determination of distance by pacing, chaining, stadia and trigonometry and carrying of elevations. Section 003. Basic Navigation. Introduces the principles of navigation using the sun as the celestial body. Emphasis is on determining latitude and longitude at solar noon. Section 004. Earthquakes. The characteristics, causes, and results of earth movements along faults. Section 005. Waves and Beaches. Analysis of wind-generated waves in the open ocean and the changes that occur as waves enter shallow water, forming surf. The tides and seismic sea waves are discussed for comparison. Repeatable. Max hours: 9 Credits.  
Grading Basis: Letter Grade  
Repeatable. Max Credits: 9.

**GEOG 1602 - Urban Studies and Planning (3 Credits)**  
Surveys the process of urbanization, emphasizing the development of American cities, using Denver as an example. Topics covered include: evolution of metropolitan form/land use patterns, cultural landscape formation, city planning and architectural design, and urban social and policy issues. Note: This course is a prerequisite for GEOG 4680 Urban Sustainability: Perspectives and Practice AND GEOG 4640 Urban Geography Denver and the US. Term offered: fall, spring. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SS2.  
Grading Basis: Letter Grade  
Additional Information: GT courses GT Pathways, GT-SS2, Soc Behav Sci: Geography; Denver Core Requirement, Social Sciences.

**GEOG 2080 - Introduction to Mapping and Map Analysis (3 Credits)**  
Studies major elements in the preparation of thematic maps, including sources of data collection and manipulation of data, and cartographic techniques for display of data. Term offered: fall, spring. Max hours: 3 Credits.  
Grading Basis: Letter Grade

**GEOG 2202 - Hazards to Disasters: Perception and Management (3 Credits)**  
Surveys those physical phenomena that often cause substantial damage when they occur in areas of human settlement. Term offered: fall, spring, summer. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SS2.  
Grading Basis: Letter Grade  
Additional Information: GT courses GT Pathways, GT-SS2, Soc Behav Sci: Geography; Denver Core Requirement, Social Sciences.

**GEOG 2939 - Internship (1-3 Credits)**

Experiences involving application of specific, relevant concepts and skills in supervised employment situations. Note: students must work with the Experiential Learning Center advising to complete a course contract and gain approval. Prereq: sophomore standing or higher. Repeatable. Max Hours: 9 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 9.

Restriction: Sophomore standing or higher.

**GEOG 3100 - Geography of Colorado (3 Credits)**

An analysis of the physical environment, history of settlement, and resource base of Colorado in relation to present economic patterns of the state. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOG 3110 - Geography of North America (3 Credits)**

Systematic study of the physical, cultural, economic, and political relationships that shape the landscape of the United States, Canada, Greenland, and the U.S.-Mexico Borderlands. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOG 3120 - Geography of Europe (3 Credits)**

An analysis of the physical environment, resource utilization, economic development and cooperation in Europe. A cultural and political geography which focuses on continuity and change in Eastern and Western Europe. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOG 3130 - Central America and the Caribbean (3 Credits)**

Surveys the physical environment and cultural development of Central America and the Caribbean Islands. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOG 3140 - Geography of South America (3 Credits)**

The physical environment, cultural development, and political instability within the area are analyzed. Influence of the landscape and climate, as well as Iberian cultural and land tenure patterns on historic settlement and modern growth are discussed. Problems associated with population, economics, politics, education, and geography are emphasized. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOG 3150 - Middle East (3 Credits)**

Physical, cultural, and economic approach to the arid lands of the Middle East, including Arab land of the Sahara. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOG 3160 - Geography of China (3 Credits)**

Geographic survey of the physical, cultural, and economic features characterizing the geography of China. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOG 3232 - Weather and Climate (3 Credits)**

Introduces the processes and systems that govern both day-to-day weather and longer-term climate variations. Covers instrumentation and weather forecasting techniques. Prerequisite: GEOG 1202 or ENVS 1042 or (ENVS 1044 and ENVS 1045). Cross-listed with ENVS 3232. Term offered: fall, spring, summer. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: GEOG 1202 or ENVS 1042 or (ENVS 1044 and ENVS 1045)

**GEOG 3240 - Colorado Climates (3 Credits)**

Provides a broad overview of the various weather and climate patterns that are found within the state of Colorado. To accomplish this, the state of Colorado will be divided into regions which (hopefully) have a large degree of homogeneity in terms of weather and climate controls. Note: Taught in a seminar style with students giving presentations and reports on their findings about a given region. Note: this course assumes that students have completed GEOG 1202 and/or GEOG 3232. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOG 3401 - Geography of Food and Agriculture (3 Credits)**

An overview of food systems and agriculture as they impact an increasingly urbanized planet. We will survey historical food production and preservation, food justice and insecurity, land-use and preservation, as well as local and global systems of distribution and consumption. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Term offered: fall. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOG 3412 - Globalization and Regional Development (3 Credits)**

Addresses global political-restructuring and its implications for regional development in the U.S. Both historical and contemporary processes of globalization are examined. Topics include: the environmental basis of American industrial growth, the relationship between technological change and geographical shifts, the rise and decline of Fordism, the transfer of Japanese manufacturing methods to the U.S., the role of regional and national industrial policy, and the social consequences of globalization for labor and communities. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Students will not earn credit for GEOG 3412 if they have already earned credit for GEOG 3411. Term offered: fall, spring. Max hours: 3 Credits.

Grading Basis: Letter Grade

Additional Information: Denver Core Requirement, International Perspectives.

**GEOG 3430 - Geography of Tourism (3 Credits)**

Geographic analysis of trends in recreation, travel, and tourism, and their economic, social, and environmental impacts. Examines growth and change in resorts and tourist destination areas. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Note: this course assumes that students have completed GEOG 1302 or GEOG 3411. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOG 3440 - Ecotourism (3 Credits)**

The geographic study of a growing segment in contemporary tourism aimed at the provision of low impact travel to fragile, pristine and usually protected areas with the purpose of directly benefitting local communities and ecological conservation. The course surveys leading destination areas for ecotourism worldwide. GEOG 1302, GEOG 3411 or GEOG 3430 recommended. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOG 3450 - Cultural Heritage and Tourism (3 Credits)**

The course involves the geographic study of tourism to heritage sites and their management. It is a growing segment in domestic and international travel, and market trends for different types of destinations in heritage tourism are examined in a local, regional and national context. The course discusses heritage planning practices and processes as well as investigates dissonant heritage and dark tourism sites. Prereq: GEOG 1302 or GEOG 3411 or GEOG 3430 with a C- or higher. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: GEOG 1302 or GEOG 3411 or GEOG 3430 with a C- or higher

**GEOG 3501 - Geography of Health (3 Credits)**

Offers a critical geographic perspective to human health issues, examining disease distributions, how changing relationships between people and their environments (natural, built, and social environments) influence health, and different approaches to the study of health in geography. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOG 3770 - Geography and Film (3 Credits)**

Geographic analysis of past and current film production and distribution systems and the complex relationships between film making and place in feature, documentary and educational film. Note: this course assumes that students have completed GEOG 1302 or GEOG 3411. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOG 3840 - Independent Study: GEOG (1-3 Credits)**

Repeatable. Max Hours: 6 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 6.

**GEOG 3939 - Internship (1-3 Credits)**

Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Note: students must work with the Experiential Learning Center advising to complete a course contract and gain approval. Prereq: Junior standing or higher. Repeatable. Max Hours: 9 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 9.

Prereq: junior standing or higher

**GEOG 3990 - Special Topics (3 Credits)**

Investigation of current topics in geography such as analysis of issues (crime, public transportation), techniques (socioeconomic impact analysis), or areas of specialization (climatology). Note: specific necessary prior coursework varies with each topic; students are expected to have completed at least six hours in relevant social or physical science coursework. Repeatable. Max Hours: 9 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 9.

**GEOG 4000 - Planning Methods (3 Credits)**

This course focuses on the most commonly applied quantitative and qualitative methods used in planning; data organization and management principles; and various ways to collect, analyze, and communicate data as a fundamental component of the planning process. Prereq: This course is intended for senior level students with a minimum cumulative gpa of 3.0. Crosslisted with URPL 5010. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: Senior level or higher with a minimum cumulative GPA of 3.0

**GEOG 4010 - Landscape Biogeochemistry (3 Credits)**

A holistic approach to studying the role chemical elements play in synthesis/decomposition cycles, and the resultant environment from interaction of the lithosphere with the hydrosphere, atmosphere, biosphere, and pedosphere during geological, and ecological timeframes, together with anthropogenic activities. Prereq: Introductory college-level physical geography or environmental science course or permission of instructor. Prereq: GEOG 1202 or GEOL 1072 or permission from instructor. Cross-listed with GEOL 4010/ENVS 5010. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: GEOG 1202 or GEOL 1072

**GEOG 4020 - Earth Environments and Human Impacts (3 Credits)**

Basic concepts describing earth's biomes and physical environment are presented in a systems context. Global warming assessment, from both political and scientific perspectives, is then presented. Model visualization of these concepts to consider human impacts on Earth's biomes is discussed. Earth system viewpoint, having links of Earth's biomes to oceans and atmosphere, completes the course discussion.

Prereq: GEOG 1202 and GEOG 3232. Cross-listed with ENVS 5020, GEOL 4020. Term offered: fall. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: GEOG 1202 and GEOG 3232

**GEOG 4060 - 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. Prereq: GEOG 2080 with a grade of C or better. Cross-listed with GEOG 5060. Term offered: fall, spring, summer. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: GEOG 2080 with a grade of C or better

**GEOG 4070 - 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: GEOG 4060/5060 with a grade of C or better, or permission of instructor. Cross-listed with GEOG 5070. Term offered: spring. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: GEOG 4060 or GEOG 5060 or GEOL 4060 or GEOL 5060, with a grade of C or better

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**GEOG 4080 - 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. Prereq: GEOG 2080 with a grade of C or better. Cross-listed with GEOG 5080. Term offered: fall, spring, summer. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: GEOG 2080 with a grade of C or better

**GEOG 4081 - Cartography and Computer Mapping (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: GEOG 4080 or GEOG 5080 or CVEN 5381 with a grade of C or better. Cross-listed with GEOG 5081. Term offered: spring, summer. Max hours: 3 Credits.

Grading Basis: Letter Grade

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



**GEOG 4085 - 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: GEOG 4080 or GEOG 5080 or CVEN 5381 with a grade of C or better, or permission of instructor. Cross-listed with GEOG 5085. Max hours: 3 Credits.

Grading Basis: Letter Grade

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

**GEOG 4086 - 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: GEOG 4091 or 5091, and GEOG 4092 or 5092. Cross-listed with GEOG 5086. Max hours: 3 Credits. Grading Basis: Letter Grade

Prereq: GEOG 4091 or 5091, and GEOG 4092 or 5092

**GEOG 4090 - 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: GEOG 4080 or GEOG 5080 or CVEN 5381 with a grade of C or better, or permission of instructor. Cross-listed with GEOG 5090. Term offered: fall. Max hours: 3 Credits.

Grading Basis: Letter Grade

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

**GEOG 4091 - 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: GEOG 4080 or 5080 or CVEN 5381 with a grade of C or better, or permission of the instructor. Cross-listed with GEOG 5091. Term offered: spring. Max hours: 3 Credits.

Grading Basis: Letter Grade

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

**GEOG 4092 - 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. Cross-listed with GEOG 5092. Prereq: grade of B- or higher in GEOG 4080 or 5080 or similar course. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: grade of B- or higher in GEOG 4080 or 5080 or similar course

**GEOG 4095 - 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: GEOG 4080 or GEOG 5080 or CVEN 5381 with a grade of C or better, computer science background, or permission of instructor. Cross-listed with GEOG 5095. Term offered: spring. Max hours: 3 Credits.

Grading Basis: Letter Grade

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

**GEOG 4150 - Place, Landscape, and Meaning (3 Credits)**

Investigates concepts that constitute place and landscape—how they are not just simply "there." Incorporates different schools of thought to help understand why landscapes are objects inseparable from us and open to multiple interpretations and meanings. Note: this course assumes that students have completed an introductory human geography course. Cross-listed with GEOG 5150. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOG 4220 - 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 5220, URPL 6549. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOG 4230 - 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. Cross-listed with GEOG 5230. Term offered: fall. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOG 4235 - 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. Cross-listed with GEOG 5235, HBSC 7235. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOG 4240 - 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. Prereq: GEOG 1202 or GEOL 1072 (required) and GEOG 3232 strongly recommended. Cross-listed with GEOL 4240, 5240 and GEOG 5240. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: GEOG 1202 or GEOL 1072

**GEOG 4251 - 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 5251, GEOL 4251 and GEOL 5251. Prereq: Students must have completed GEOG 1202 or GEOL 1072 or have graduate standing or gain instructor approval in order to register for this course. GEOG 3232 is strongly recommended, though not required. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: GEOG 1202 or GEOL 1072 or graduate standing

**GEOG 4260 - Energy and Natural Resource Planning (3 Credits)**

This course provides an overview of the issues associated with energy and natural resource planning. Topics include: energy policy; alternative energy development; water resources; extraction/mining; natural resource protection and regulation; resource management, policies, politics, and technologies. Cross-listed with URPL 6510. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOG 4265 - 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 may count for the International Studies major or minor. See your INTS advisor for more information.

Prereq: ENVS 1042 OR ENVS 1044 and ENVS 1045 with a C- or higher.

Cross-listed with GEOG 5265. Repeatable. Max Hours: 6 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 6.

Prereq: ENVS 1042 OR ENVS 1044 and ENVS 1045 with a C- or higher.

**GEOG 4270 - 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. Cross-listed with GEOG/GEOL 4270/5270. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOG 4280 - Environmental Hydrology (4 Credits)**

Examination of hydrologic processes in relation to climate, soils, vegetation, land-use practices, and human interactions. Natural scientific perspectives emphasized; field and laboratory included. Prereq: GEOG 1202 AND one of: 1) GEOG 3232; 2) GEOG 4240/GEOL 4240/ GEOG 5240; 3) GEOG 4010/GEOL 4010/ENVS 5000. Cross-listed with GEOL 4280 and ENVS 5280. Max hours: 4 Credits.

Grading Basis: Letter Grade

Prereq: GEOG 1202 AND one of: 1) GEOG 3232; 2) GEOG 4240/ GEOL 4240/ GEOG 5240; 3) GEOG 4010/GEOL 4010/ENVS 5000

**GEOG 4300 - Children's Geographies (3 Credits)**

This seminar is an interdisciplinary investigation of children, childhood and environment in the context of sustainability and equity. Theoretical and methodological perspectives are applied to understand children's interactions with/in different spaces. Cross-listed with GEOG 5300, ENVS 4300 and ENVS 5300. Restriction: Restricted to students with junior standing or higher or with instructor permission. Term offered: spring. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to undergraduate students at a junior standing or higher

**GEOG 4301 - Population, Culture, and Resources (3 Credits)**

Increasing world human populations are examined in the context of regional and global resources. Opposing viewpoints are studied, and students are required to complete a case study of a self-selected issue analyzing viewpoints associated with relevant opposing opinions. Note: This course may count for the International Studies major or minor. See your INTS advisor for more information. Students may not receive credit for this course if they have already received credit for GEOG 3301. Cross-listed with GEOG 5301. Prereq: Junior standing or higher. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: junior standing or higher

**GEOG 4305 - Water Quality and Resources (3 Credits)**

Introduces water resources aimed at students with little or no background in the field. This is a broad course covering topics ranging from the physical aspects of water to water politics and international law. While the course is largely a lecture format, discussion of current issues is a significant part of the class. Cross-listed with ENVS 5305. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOG 4335 - 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 5335. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOG 4350 - 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 5350. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOG 4380 - 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. Cross-listed with GEOG 5380, ENVS 4380, and ENVS 5380. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOG 4400 - Regional Economic Systems (3 Credits)**

This course offers a comprehensive investigation into regional economic systems; metropolitan economies; regional economic development; regional market assessment; job generation; taxes/spending; and fiscal/economic policies and impacts at the metropolitan, regional, and statewide scale. Cross-listed with URPL 6605. Max hours: 3 Credits. Grading Basis: Letter Grade

**GEOG 4420 - 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 5420. Max hours: 3 Credits. Grading Basis: Letter Grade

**GEOG 4440 - 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 5440. Max hours: 3 Credits. Grading Basis: Letter Grade

**GEOG 4450 - Urban Food and Agriculture: Perspectives and Research (3 Credits)**

Provides an overview of research & practices in urban farming. Critically reviews emergent models of local food production/distribution. Compares new practices to traditional agribusiness. Assesses the prospects for solving sustainability problems within the modern agro-food system. Cross-list ENVS 5450. Max hours: 3 Credits. Grading Basis: Letter Grade  
Typically Offered: Spring.

**GEOG 4460 - Sustainable Urban Agriculture Field Study I (3 Credits)**

Provides a field-based overview of urban farm planning & management. Topics: range/land conservation, native/invasive species, water distribution, animal husbandry, government interaction, local markets, community relations, conservation easements and issues pertaining to urban farming. Note: this course assumes that students have completed GEOG 4450. Cross-list ENVS 5460. Max hours: 3 Credits. Grading Basis: Letter Grade  
Typically Offered: Fall.

**GEOG 4470 - Sustainable Urban Agriculture Field Study II (3 Credits)**

Provides a field-based overview of current practices in local agricultural production. Emphasis will be placed on sustainable practices and their most efficient situation, Special consideration will be given to plausible solutions for food insecure communities both local and global. Note: this course assumes that students have completed GEOG 4450 and 4460. Cross-list ENVS 5470. Max hours: 3 Credits. Grading Basis: Letter Grade  
Typically Offered: Spring.

**GEOG 4480 - Urban Vegetable CSA: Planning, Production&Distribution (3 Credits)**

This course outlines the planning, production, and distribution in an active urban vegetable CSA (community supported agriculture) model. It is offered as a part of the GES Sustainable Urban Agriculture Certificate. Cross-listed with ENVS 5480. Max hours: 3 Credits. Grading Basis: Letter Grade

**GEOG 4625 - Urban America: Colonial Times to the Present (3 Credits)**

Rise of the American city from colonial times to present. Major emphasis on the process of urbanization since 1840: town promotion, the industrial city, immigration, boss politics and reform, urban technology, transportation systems, minorities, city planning, and the future of urban America. Cross-listed with HIST 4225, HIST 5225, WGST 4225, WGST 5225, GEOG 4625. Max hours: 3 Credits. Grading Basis: Letter Grade

**GEOG 4630 - Transportation, Land Use, and the Environment (3 Credits)**

This course teaches how current transportation modes shape regions and how future transportation technologies might impact us. Topics include policy making and governance; land use interactions with transportation investments; climate change and resilience; energy use; environmental justice; and equity considerations. Cross-listed with URPL 6555. Max hours: 3 Credits. Grading Basis: Letter Grade

**GEOG 4640 - 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 5640. Prereq: GEOG 1602 with a grade of C- or higher or permission from instructor. Max Hours: 3 Credits. Grading Basis: Letter Grade  
Prereq: GEOG 1602 with a grade of C- or higher.

**GEOG 4670 - Transportation Planning and Policy (3 Credits)**

This course examines policy issues in urban transportation planning: how transportation system design and political/institutional contexts shape transportation decision-making; major modes of urban transportation; and the social, environmental, economic, energy, and health impacts of transportation systems. Cross-listed with URPL 6550. Max hours: 3 Credits. Grading Basis: Letter Grade

**GEOG 4680 - 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 5680. Prereq: ENVS 1342 or GEOG 1602 with a grade of C- or higher or permission from instructor. Max Hours: 3 Credits. Grading Basis: Letter Grade  
Prereq: ENVS 1342 or GEOG 1602 with a grade of C- or higher.

**GEOG 4700 - Synthesis for Interdisciplinary Science (3 Credits)**

Synthesis is an approach in interdisciplinary research and education that links ideas, data and methods. This course develops synthesis skills through the lens of systems theory. It includes exercises for synthetic thinking, examination of integrative tools, and a service-learning project. Cross-listed with ENVS 5700. Breadth and depth training in environmental sciences. Interest in interdisciplinary collaboration. Prereq: Senior standing. Max hours: 3 Credits. Grading Basis: Letter Grade  
Restrictions: Restricted to Senior standing.

**GEOG 4710 - 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. Max hours: 3 Credits. Grading Basis: Letter Grade

**GEOG 4720 - 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. Prereq: GEOG 3232. Cross-listed with GEOG 5720/ENVS 4720/ ENVS 5720. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: GEOG 3232

**GEOG 4731 - Mountain Biogeography (4 Credits)**

This course utilizes the close proximity of the Rocky Mountains to examine altitudinal influences on species distributions. Topics include species patterns and distributions, disturbance, climate impacts, forest management and sustainability. Note: A three-day field trip within Colorado will occur the first weekend of the Fall semester, and is highly encouraged. Prereq: GEOG 1202 or ENVS 1042 or graduate standing or permission from the instructor is required in order to register for this course. Cross-listed with ENVS 5731. Max hours: 4 Credits.

Grading Basis: Letter Grade

Prereq: GEOG 1202 or ENVS 1042 or graduate standing

**GEOG 4740 - 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. Cross-listed with GEOG 5740, ENVS 4740, ENVS 5740. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOG 4750 - 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. Prereq: ENVS 1044 and 1045 or BIOL 2010 (or 2061/2097/2030) and BIOL 2011 (or 2081/2098/2031) or BIOL 2020 (or 2051/2095/2040) and BIOL 2021 (or 2071/2096/2041) with a C- or higher. Cross-listed with GEOG 5750, ENVS 4750, and ENVS 5750. Max hours: 4 Credits.

Grading Basis: Letter Grade

Prereq: ENVS 1044 and 1045 or BIOL 2010 (or 2061/2097/2030) and BIOL 2011 (or 2081/2098/2031) or BIOL 2020 (or 2051/2095/2040) and BIOL 2021 (or 2071/2096/2041) with a C- or higher.

**GEOG 4770 - Applied Statistics for the Natural Sciences (3 Credits)**

Surveys statistical techniques including: quick review of basic statistics, tests for normality and outliers, display of data; simple and multiple regression; ANOVA and its relation to regression. Emphasis on computer or stat-pak analysis and interpretation of statistical results. Prereq: College algebra and GEOG 2080, or consent of instructor. Cross-listed with ENVS 5600. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: MATH 1110 or MATH 1070, and GEOG 2080

**GEOG 4840 - Independent Study: GEOG (1-3 Credits)**

Independent research primarily for undergraduate majors. Prereq: Permission of department. Repeatable. Max Hours: 12 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 12.

**GEOG 4850 - Understanding And Communicating Field Methods (3 Credits)**

Interdisciplinary course that presents a balanced overview of common field methods and how to communicate them effectively to a general audience. Includes hands-on experience with various field methods (e.g., transects, survey design, historical assessment, GIS, etc.) and communication strategies. Note: this course assumes that students have completed an introductory geography or environmental science course. Prereq: Junior standing or higher. Cross-listed with GEOG 5850 and ENVS 4850/5850. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: junior standing or higher

**GEOG 4880 - 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

Repeatable. Max Credits: 6.

**GEOG 4900 - Colloquium (1 Credit)**

Engages students and faculty in discussion of current and pertinent world topics, including specific readings, (guest) presentations, and creation of working research papers, among other items. Students and faculty may work in research groups to accomplish specific goals. Prereq: Junior standing or higher. Cross-listed with ENVS 4900, ENVS 5900, GEOG 5900. Repeatable. Max Hours: 4 Credits.

Grading Basis: Pass/Fail Only

Repeatable. Max Credits: 4.

Prereq: junior standing or higher

**GEOG 4940 - Senior Seminar (3 Credits)**

Introduces students to the professional literature in the field. Various professionals and faculty lecture about geography/planning research and careers. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOG 4950 - Honors Thesis (3 Credits)**

A capstone course designed to promote critical thinking, research methodology, and writing/oral presentation skills. Students design and develop a research project under the supervision of a faculty advisor. Each student gives an oral presentation or defense of his or her thesis at the end of the semester in which they enroll. Note: this course assumes that students have completed GEOG 4940. Prereq: Junior standing or higher. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: junior standing or higher

Additional Information: Report as Full Time.

**GEOG 4990 - Special Topics (1-6 Credits)**

Repeatable. Max hours: 9 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 9.

**GEOG 4992 - Advanced Regional Field Study (1-6 Credits)**

Directed, hands-on study of concepts involved in understanding geographic regions. Utilizes field observations, field techniques/methods, & data observation, collection, analysis, & interpretation related to the specific region being studied. May include physical as well as cultural phenomena. Note: Instructor permission required. Cross-listed with GEOG 5992, ENVS 4992, ENVS 5992. Repeatable. Max Hours: 12 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 12.



**GEOG 4995 - 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. Cross-listed with ENVS 4995, ENVS 5995, and GEOG 5995. Repeatable. Max Hours: 12 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 12.

**Geology (GEOL)****GEOL 1022 - History of Life (3 Credits)**

Non-technical study of fossils through time and their relationships to environments through earth history. Includes discussion of evolution and extinction events and current controversies. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOL 1073 - Physical Geology: Surface Processes (3 Credits)**

This survey course develops a basic understanding of surface processes and landforms in geology. It includes one all-day field trip. Students must also take the accompanying laboratory GEOL 1074. No co-credit with GEOL 1072. Prereq or Co-req: GEOL 1074. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq or Co-req: GEOL 1074

Additional Information: Denver Core Requirement, Biol Phys Sci - Lec.

**GEOL 1074 - Physical Geology: Surface Processes Laboratory (1 Credit)**

Introduces the basic scientific approach through investigations, observations, and experiments in surface processes and landforms in geology. Students must also take the accompanying lecture GEOL 1073. Prereq or Co-req: GEOL 1073. Max hours: 1 Credit.

Grading Basis: Letter Grade

Prereq or co-req: GEOL 1073

Additional Information: Denver Core Requirement, Biol Phys Sci - Lab.

**GEOL 1083 - Physical Geology: Internal Processes (3 Credits)**

This survey course develops a basic understanding of physical geology emphasizing the earth's interior, covering internal processes and properties, with plate tectonics as the underlying theme. Includes one all-day field trip. Students must also take the accompanying laboratory GEOL 1084. No co-credit with GEOL 1082. Prereq or co-req: GEOL 1084. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq or co-req: GEOL 1084

Additional Information: Denver Core Requirement, Biol Phys Sci - Lec.

**GEOL 1084 - Physical Geology: Internal Processes Laboratory (1 Credit)**

Introduces the basic scientific approach through investigations, observations, and experiments in internal geologic processes and properties of the earth's interior with plate tectonics as the underlying theme. Prereq or co-req: GEOL 1083. Max hours: 1 Credit.

Grading Basis: Letter Grade

Prereq or co-req: GEOL 1083

Additional Information: Denver Core Requirement, Biol Phys Sci - Lab.

**GEOL 1111 - First Year Seminar (3 Credits)**

Restriction: Restricted to Freshman level students. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to Freshman level students

**GEOL 1115 - Earth Sciences Content (1-3 Credits)**

Covers content areas of undergraduate earth sciences. Topics include physical geology; historical geology; oceanography; meteorology; and astronomy. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOL 1202 - Introduction to Oceanography (3 Credits)**

Surveys modern scientific knowledge of the world's oceans. Intended for non-science students, the course offers a non-quantitative introduction to the major facts and principles of physical, chemical, biological, and geological oceanography. The impact of natural and anthropic events on the marine environment are included. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOL 1400 - Geology of the National Parks (3 Credits)**

Combines lecture and laboratory exercises to help students interpret Earth history using the national parks as examples. Students learn to identify the common rocks and minerals, and how to interpret topographic and geologic maps. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOL 1840 - Independent Study: GEOL (1-3 Credits)**

Repeatable. Max hours: 3 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 3.

**GEOL 2939 - Internship (1-3 Credits)**

Experiences involving application of specific, relevant concepts and skills in supervised employment situations. Note: students must work with the Experiential Learning Center advising to complete a course contract and gain approval. Prereq: 15 hours of 2.75 GPA. Repeatable. Max Hours: 9 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 9.

**GEOL 3011 - Mineralogy (4 Credits)**

Principles of mineralogy, including crystallography, crystal chemistry, and a systematic study of the more important nonsilicate and silicate minerals. Origins and occurrences of minerals. Note: this course assumes that students have taken physical geology and college-level chemistry. Max hours: 4 Credits.

Grading Basis: Letter Grade

**GEOL 3032 - Geology of Colorado (3 Credits)**

Introductory course focused on the geology of Colorado. The course is divided into two parts: the first half covers general principles of geology, and the second is devoted to the observation of rock types, structures, and geologic relationships in the field. Discussion of plate tectonics, rock formation, construction and interpretation of geologic maps, the geologic time scale, geologic provinces of Colorado, evolution of major landforms, formation and development of mineral resources of Colorado, and current topics in environmental geology. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOL 3102 - Dinosaurs Past and Present (3 Credits)**

A broad-based, non-technical new look at the world's most popular prehistoric animals. Stresses the rapid and perennial growth of knowledge about dinosaurs and the relevance of such knowledge in the 20th century. Prereq: Introductory geology and/or biology are recommended. Max hours: 3 Credits.

Grading Basis: Letter Grade

**GEOL 3411 - Introductory Paleontology (4 Credits)**

Studies invertebrate fossils, including a survey of the organic world and its history in the geological past. Includes an introduction to evolution and paleoecology, and discussion of the uses of fossils in geologic correlations. Note: this course assumes that students have taken introductory geology-surface processes or an introductory biology course. Max hours: 4 Credits.

Grading Basis: Letter Grade

**GEOL 3421 - Sedimentation and Stratigraphy (4 Credits)**

Introduces the principles of sedimentology and stratigraphy. Emphasis is on dynamic processes within sedimentary environments and the resulting stratigraphic record. Prereq: GEOL 1082. Max hours: 4 Credits. Grading Basis: Letter Grade  
Prereq: GEOL 1082

**GEOL 3840 - Independent Study: GEOL (1-3 Credits)**

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

**GEOL 3939 - Internship (1-3 Credits)**

Designed experiences involving application of specific, relevant concepts and skills in supervised employment situations. Note: students must work with the Experiential Learning Center advising to complete a course contract and gain approval. Prereq: Junior standing or higher. Repeatable. Max Hours: 9 Credits.  
Grading Basis: Letter Grade  
Repeatable. Max Credits: 9.  
Prereq: junior standing or higher

**GEOL 4010 - Landscape Biogeochemistry (3 Credits)**

A holistic approach to studying the role chemical elements play in synthesis/decomposition cycles, and the resultant environment from interaction of the lithosphere with the hydrosphere, atmosphere, biosphere, and pedosphere during geological, and ecological timeframes, together with anthropogenic activities. Prereq: GEOG 1202 or GEOL 1072 or permission of instructor. Cross-listed with GEOG 4010/ENVS 5010. Max hours: 3 Credits.  
Grading Basis: Letter Grade  
Prereq: GEOG 1202 or GEOL 1072

**GEOL 4020 - Earth Environments and Human Impacts (3 Credits)**

Basic concepts describing earth's biomes and physical environment are presented in a systems context. Global warming assessment, from both political and scientific perspectives, is then presented. Model visualization of these concepts to consider human impacts on Earth's biomes is discussed. Earth system viewpoint, having links of Earth's biomes to oceans and atmosphere, completes the course discussion. Cross-listed with ENVS 5020, GEOG 4020. Term offered: fall. Max hours: 3 Credits.  
Grading Basis: Letter Grade

**GEOL 4030 - Environmental Geology (3 Credits)**

Applies geological information to interactions between people and the physical environment. Increasing awareness of its importance in our society means that this is an expanding field as companies are required to address the environmental consequences of their actions. Prereq: Senior standing. Cross-listed with ENVS 5030 and GEOL 5030. Max hours: 3 Credits.  
Grading Basis: Letter Grade  
Restrictions: Restricted to Senior standing.

**GEOL 4111 - Field Methods In Geology (3 Credits)**

Introduction to the basic methods of geologic mapping (metamorphic, sedimentary, and igneous rocks), including use of the Brunton compass and Jacob Staff, as well as preparation of measured stratigraphic sections, geologic maps, and geologic cross-sections. Note: GEOL 1072 or GEOG 1202 required, GEOL 3421 strongly recommended. Prereq: GEOG 1202 or GEOL 1072. Cross-listed with GEOL 5111. Max hours: 3 Credits.  
Grading Basis: Letter Grade  
Prereq: GEOG 1202 or GEOL 1072

**GEOL 4240 - 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. Prereq: GEOG 1202 or GEOL 1072 (required) and GEOG 3232 strongly recommended. Cross-listed with GEOG 4240, 5240 and GEOL 5240. Max hours: 3 Credits.  
Grading Basis: Letter Grade  
Prereq: GEOG 1202 or GEOL 1072

**GEOL 4251 - 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, GEOG 5251 and GEOL 5251. Prereq: Students must have completed GEOG 1202 or GEOL 1072 or have graduate standing or gain instructor approval in order to register for this course. GEOG 3232 is strongly recommended, though not required. Max hours: 3 Credits.  
Grading Basis: Letter Grade  
Prereq: GEOG 1202 or GEOL 1072 or graduate standing

**GEOL 4270 - 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. Prereq: GEOG 1202 or GEOL 1072. Cross-listed with GEOG/GEOL 4270/5270. Max hours: 3 Credits.  
Grading Basis: Letter Grade  
Prereq: GEOG 1202 or GEOL 1072

**GEOL 4780 - Engineering Geology (4 Credits)**

Studies geology as utilized in engineering and environmental practice. Emphasizes a conceptual integration of geologic materials, processes, and rates of change as a basis for successful application of geologic knowledge to environmental planning and engineering design projects. Prereq: MATH 2411 and CVEN 2121. Cross-listed with GEOL 5780 and CVEN 4780. Max hours: 4 Credits.  
Grading Basis: Letter Grade  
Prereq: CVEN 2121 and MATH 2411

**GEOL 4840 - Independent Study: GEOL (1-3 Credits)**

Repeatable. Max Hours: 12 Credits.  
Grading Basis: Letter Grade  
Repeatable. Max Credits: 12.

**GEOL 4880 - 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  
Repeatable. Max Credits: 6.

**GEOL 4995 - 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. Prereq: GEOL 1072 and GEOL 1082. Cross-listed with GEOL 5995. Repeatable. Max hours: 12 Credits.  
Grading Basis: Letter Grade  
Repeatable. Max Credits: 12.  
Prereq: GEOL 1072 and GEOL 1082

**GEOL 5001 - RM-MSMSP. Earth Processes I (4 Credits)**

Systematic study of geological concepts, rock and mineral formation, plate tectonics, volcanism and earthquakes, landforms and weathering, historical environmental interpretation. Includes a field component. This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Note: students should obtain permission of project director prior to enrolling in this course. Prereq: Graduate standing. Max hours: 4 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to Graduate and Graduate Non-Degree Majors

**GEOL 5002 - RM-MSMSP. Earth Sciences II - Sedimentology and Paleontology (4 Credits)**

Field and lecture course building on Earth Sciences I, which covers internal earth processes. Students learn about erosional processes and how sedimentary rocks are deposited and may be preserved; the different ways fossils are preserved; describing rocks in the field; and collecting, preparing and describing fossils. Provides an overview of the geology of the area so that students can place the detailed studies in context. This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Prereq: GEOL 5001. Max hours: 4 Credits.

Grading Basis: Letter Grade

Prereq: GEOL 5001

**GEOL 5003 - RM-MSMSP. Earth Science in Context (4 Credits)**

Designed for teachers in the RM-MSMSP program. Topics include global climate change, glaciers, coastal geology, volcanism, and their effects on culture. Monuments such as Florissant Fossil Beds, Ice Core, Cave of the Winds and a quarry will be visited. Note: This course is not applicable toward any degree in the College of Liberal Arts and Sciences. Prereq: Graduate standing. Max hours: 4 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to Graduate and Graduate Non-Degree Majors

**GEOL 5004 - RM-MSMSP Research Experience for Teachers - Geology Cohort (1-6 Credits)**

A five-week research exploration in which RM-MSMSP teachers will raise their level of relevant scientific understanding by engaging in a "hands-on" workshop, transforming what they have learned into new curricular materials that will improve the scientific abilities of their students and hopefully stimulate them to consider a STEM career. Note: credit may not apply toward any CLAS degree. Prereq: Graduate standing. Max hours: 6 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to Graduate and Graduate Non-Degree Majors

**GEOL 5030 - Environmental Geology (3 Credits)**

Applies geological information to interactions between people and the physical environment. Increasing awareness of its importance in our society means that this is an expanding field as companies are required to address the environmental consequences of their actions. Note: students should be enrolled in the MSES program to take this course. All other students should consult with the instructor and obtain their permission prior to registering for this course. Prereq: Graduate standing. Cross-listed with GEOL 4030 and ENVS 5030. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to Graduate and Graduate Non-Degree Majors

**GEOL 5111 - Field Methods in Geology (3 Credits)**

Introduction to the basic methods of geologic mapping (metamorphic, sedimentary, and igneous rocks), including use of the Brunton compass and Jacob Staff, as well as preparation of measured stratigraphic sections, geologic maps, and geologic cross-sections. Note: this course assumes that students have completed GEOL 1072 or GEOG 1202.

GEOL 3421 is strongly recommended. Prereq: Graduate standing. Cross-listed with GEOL 4111. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to Graduate and Graduate Non-Degree Majors

**GEOL 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 GEOG 4240, 5240 and GEOL 4240. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to Graduate and Graduate Non-Degree Majors

**GEOL 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, GEOG 5251 and GEOL 4251.

Restriction: Restricted to Graduate and Graduate Non-Degree students. GEOG 3232 is strongly recommended, though not required. Max Hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to Graduate and Graduate Non-Degree Majors

**GEOL 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. Prereq: Graduate standing. Cross-listed with GEOG/GEOL 4270/5270. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to Graduate and Graduate Non-Degree Majors

**GEOL 5780 - Engineering Geology (4 Credits)**

Studies geology as utilized in engineering and environmental practice. Emphasizes a conceptual integration of geologic materials, processes, and rates of change as a basis for successful application of geologic knowledge to environmental planning and engineering design projects. Note: this course assumes that students have completed MATH 2411 and CVEN 2121. Prereq: Graduate standing. Cross-listed with GEOL 4780 and CVEN 5780. Max hours: 4 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to Graduate and Graduate Non-Degree Majors

**GEOL 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

Repeatable. Max Credits: 6.

**GEOL 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. Prereq: Graduate standing. Repeatable. Max Hours: 9 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 9.

Restriction: Restricted to Graduate and Graduate Non-Degree Majors

**GEOL 5950 - Master's Thesis (1-8 Credits)**

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.

**GEOL 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. Prereq: Graduate standing. Cross-listed with GEOL 4995. Repeatable. Repeatable. Max Hours: 12 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 12.

Restriction: Restricted to Graduate and Graduate Non-Degree Majors

**GEOL 6840 - Independent Study: GEOL (1-3 Credits)**

Prereq: Graduate standing. Repeatable. Max Hours: 9 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 9.

Restriction: Restricted to Graduate and Graduate Non-Degree Majors

**GEOL 6950 - Master's Thesis (1-8 Credits)**

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.

**GEOL 6960 - Master's Project (1-8 Credits)**

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.

## Environmental Sciences (ENVS)

**ENVS 1044 - Introduction to Environmental Sciences (3 Credits)**

This survey course develops a basic understanding of ecological relationships and environmental systems. Issues such as the effects of human activities on earth's environment, extinction or diversity, greenhouse effect, hazardous or toxic wastes and human population growth are discussed. Students must also take the accompanying laboratory ENVS 1045. No co-credit with ENVS 1042. Prereq or co-req: ENVS 1045. Term offered: fall, spring, summer. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq or co-req: ENVS 1045

Additional Information: Denver Core Requirement, Biol Phys Sci - Lec.

**ENVS 1045 - Introduction to Environmental Sciences Laboratory (1 Credit)**

Introduces the basic scientific approach through investigations, observations, and experiments in environmental science. Students must also take the accompanying lecture ENVS 1044. No co-credit with ENVS 1042. Prereq or co-req: ENVS 1044. Max hours: 1 Credit.

Grading Basis: Letter Grade

Prereq or co-req: ENVS 1044

Additional Information: Denver Core Requirement, Biol Phys Sci - Lab.

**ENVS 1342 - Environment, Society and Sustainability (3 Credits)**

Overview of perspectives on environmental issues within the context of sustainable development and taking a systems approach. The focus is on social science approaches to explore the human footprint on the earth, environmentalism, scientific uncertainty, policy creation and social change. Note: This course is a prerequisite for GEOG 4680 Urban Sustainability: Perspectives and Practice. Term offered: fall, spring. Max hours: 3 Credits. GT: Course is approved by the Colorado Dept of Higher Education for statewide guaranteed transfer, GT-SS2.

Grading Basis: Letter Grade

Additional Information: Denver Core Requirement, Social Sciences; GT courses GT Pathways, GT-SS2, Soc Behav Sci: Geography.

**ENVS 2939 - Internship (3 Credits)**

Experiences involving application of specific, relevant concepts and skills in supervised employment situations. Note: students must work with the Experiential Learning Center advising to complete a course contract and gain approval. Prereq: sophomore standing or higher. Repeatable. Max Hours: 9 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 9.

Restriction: Sophomore standing or higher.

**ENVS 3082 - Energy and the Environment (3 Credits)**

For students of various backgrounds who wish to increase their understanding of the environmental and technical issues of supplying the energy demands of our society. Alternative energy sources and conservation are explored as solutions to promote a sustainable society. Note: One college-level science course and MATH 1110 or equivalent are strongly recommended as preparation for optimal student success. Cross-listed with PHYS 3082. Max hours: 3 Credits.

Grading Basis: Letter Grade

**ENVS 3232 - Weather and Climate (3 Credits)**

Introduces the processes and systems that govern both day-to-day weather and longer-term climate variations. Covers instrumentation and weather forecasting techniques. Prereq: GEOG 1202 or ENVS 1042 or (ENVS 1044 and ENVS 1045) Cross-listed with GEOG 3232. Term offered: fall, spring. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: GEOG 1202 or ENVS 1042 or (ENVS 1044 and ENVS 1045)

**ENVS 3500 - Topics in Environmental Sciences (1-6 Credits)**

Note: Topics may vary from one offering to the next. Repeatable.

Grading Basis: Letter Grade

Repeatable. Max Credits: 9.

**ENVS 4210 - Mining and the Environment (3 Credits)**

Mineral resources such as metals have played an important role in human civilization. However, the extraction, processing, and use of metals have left a legacy of damage to the environment and human health. These impacts and their mitigation are examined. Note: this course assumes that students have completed one course in college science or mathematics. Max hours: 3 Credits.

Grading Basis: Letter Grade



**ENVS 4300 - Children's Geographies (3 Credits)**

This seminar is an interdisciplinary investigation of children, childhood and environment in the context of sustainability and equity. Theoretical and methodological perspectives are applied to understand children's interactions with/in different spaces. Cross-listed with GEOG 4300, GEOG 5300 and ENVS 5300. Restriction: Restricted to students with junior standing or higher or with instructor permission. Term offered: spring. Max hours: 3 Credits.

Grading Basis: Letter Grade

Restriction: Restricted to undergraduate students at a junior standing or higher

**ENVS 4380 - 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. Cross-listed with GEOG 4380, GEOG 5380, and ENVS 5380. Max hours: 3 Credits.

Grading Basis: Letter Grade

**ENVS 4500 - Topics In Environmental Sciences (1-6 Credits)**

Note: Topics may vary from one offering to the next. Note: necessary prior coursework varies according to the topic. Students should consult with the instructor. Repeatable. Max Hours: 6 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 6.

**ENVS 4650 - Environmental Education (3 Credits)**

This course links the theory and practice of environmental education to inform curricular development and pedagogical knowledge. Cross-listed with ENVS 5650 and SCED 5650. Max hours: 3 Credits.

Grading Basis: Letter Grade

**ENVS 4720 - 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. Prereq: GEOG 3232. Cross-listed with GEOG 4720/ GEOG 5720/ ENVS 5720. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: GEOG 3232

**ENVS 4740 - 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. Cross-listed with GEOG 4740, GEOG 5740, ENVS 5740. Max hours: 3 Credits.

Grading Basis: Letter Grade

**ENVS 4750 - 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. Prereq: ENVS 1044 and 1045 or BIOL 2010 (or 2061/2097/2030) and BIOL 2011 (or 2081/2098/2031) or BIOL 2020 (or 2051/2095/2040) and BIOL 2021 (or 2071/2096/2041) with a C- or higher. Cross-listed with GEOG 4750, GEOG 5750, and ENVS 5750. Max hours: 4 Credits.

Grading Basis: Letter Grade

Prereq: ENVS 1044 and 1045 or BIOL 2010 (or 2061/2097/2030) and BIOL 2011 (or 2081/2098/2031) or BIOL 2020 (or 2051/2095/2040) and BIOL 2021 (or 2071/2096/2041) with a C- or higher.

**ENVS 4840 - Independent Study: ENVS (1-3 Credits)**

Repeatable. Max Hours: 6 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 6.

**ENVS 4850 - Understanding and Communicating Field Methods (3 Credits)**

Interdisciplinary course that presents a balanced overview of common field methods and how to communicate them effectively to a general audience. Includes hands-on experience with various field methods (e.g., transects, survey design, historical assessment, GIS, etc.) and communication strategies. Note: this course assumes that students have completed an introductory geography or environmental science course. Prereq: Junior standing or higher. Cross-listed with ENVS 5850 and GEOG 4850/5850. Max hours: 3 Credits.

Grading Basis: Letter Grade

Prereq: junior standing or higher

**ENVS 4880 - 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

Repeatable. Max Credits: 6.

**ENVS 4900 - Colloquium (1 Credit)**

Engages students and faculty in discussion of current and pertinent world topics, including specific readings, (guest) presentations, and creation of working research papers, among other items. Students and faculty may work in research groups to accomplish specific goals. Prereq: Junior standing or higher. Cross-listed with ENVS 5900, GEOG 4900 and 5900. Repeatable. Max Hours: 4 Credits.

Grading Basis: Pass/Fail Only

Repeatable. Max Credits: 4.

Prereq: junior standing or higher

**ENVS 4992 - Advanced Regional Field Study (1-6 Credits)**

Directed, hands-on study of concepts involved in understanding geographic regions. Utilizes field observations, field techniques/methods, & data observation, collection, analysis, & interpretation related to the specific region being studied. May include physical as well as cultural phenomena. Note: Instructor permission required. Cross-listed with ENVS 5992, GEOG 4992, GEOG 5992. Repeatable. Max Hours: 12 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 12.

ENVS 4995 - 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.

Repeatable. Max Hours: 12 Credits.

Grading Basis: Letter Grade

Repeatable. Max Credits: 12.