

# GEOGRAPHY

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

Students wishing to pursue graduate work in geography leading to candidacy for advanced degrees should read carefully the requirements for advanced degrees in the Graduate School section. Additional information should be obtained from the Department of Geography.

The course code for this program is GEOG.

## Master's Degree

- Geography - Master of Arts (MA) ([catalog.colorado.edu/graduate/colleges-schools/arts-sciences/programs-study/geography/geography-master-arts-ma](https://catalog.colorado.edu/graduate/colleges-schools/arts-sciences/programs-study/geography/geography-master-arts-ma))

## Doctoral Degree

- Geography - Doctor of Philosophy (PhD) ([catalog.colorado.edu/graduate/colleges-schools/arts-sciences/programs-study/geography/geography-doctor-philosophy-phd](https://catalog.colorado.edu/graduate/colleges-schools/arts-sciences/programs-study/geography/geography-doctor-philosophy-phd))

## Certificates

- Development Studies - Graduate Certificate ([catalog.colorado.edu/graduate/colleges-schools/arts-sciences/programs-study/geography/development-studies-graduate-certificate](https://catalog.colorado.edu/graduate/colleges-schools/arts-sciences/programs-study/geography/development-studies-graduate-certificate))
- Hydrologic Sciences - Graduate Certificate ([catalog.colorado.edu/graduate/colleges-schools/arts-sciences/programs-study/geological-sciences/hydrologic-sciences-graduate-certificate](https://catalog.colorado.edu/graduate/colleges-schools/arts-sciences/programs-study/geological-sciences/hydrologic-sciences-graduate-certificate))
- Population Studies - Graduate Certificate ([catalog.colorado.edu/graduate/colleges-schools/arts-sciences/programs-study/geography/population-studies-graduate-certificate](https://catalog.colorado.edu/graduate/colleges-schools/arts-sciences/programs-study/geography/population-studies-graduate-certificate))

## Interdisciplinary Program

- Earth Data Analytics - Foundations - Graduate Certificate ([catalog.colorado.edu/graduate/colleges-schools/interdisciplinary-programs/earth-data-analytics-foundations-graduate-certificate](https://catalog.colorado.edu/graduate/colleges-schools/interdisciplinary-programs/earth-data-analytics-foundations-graduate-certificate))

## Faculty

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

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

Anderson, Suzanne Prestrud ([https://experts.colorado.edu/display/fisid\\_131099](https://experts.colorado.edu/display/fisid_131099))  
Professor; PhD, University of California, Berkeley

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

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

Barry, Roger G.  
Professor Emeritus

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

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

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

Caine, T. Nelson  
Professor Emeritus

Erickson, Kenneth A.  
Professor Emeritus

Farmer, Carson J.Q. ([https://experts.colorado.edu/display/fisid\\_156292](https://experts.colorado.edu/display/fisid_156292))  
Assistant Professor; PhD, National University of Ireland (Ireland)

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

Foote, Kenneth E.  
Professor Emeritus

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

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

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

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

Pitlick, John ([https://experts.colorado.edu/display/fisid\\_105951](https://experts.colorado.edu/display/fisid_105951))  
Professor, Associate Chair; PhD, Colorado State University

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

Riosmena, Fernando ([https://experts.colorado.edu/display/fisid\\_144419](https://experts.colorado.edu/display/fisid_144419))  
Associate Professor; PhD, University of Pennsylvania

Rogers, Andrei  
Professor Emeritus

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

Spielman, Seth Edward ([https://experts.colorado.edu/display/fisid\\_148271](https://experts.colorado.edu/display/fisid_148271))  
Associate Professor; PhD, SUNY at Buffalo

Steffen, Konrad  
Professor Emeritus

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

Truelove, Yaffa  
Assistant Professor; PhD, University of Cambridge

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

Williams, Mark W. ([https://experts.colorado.edu/display/fisid\\_105438](https://experts.colorado.edu/display/fisid_105438))  
Professor; PhD, University of California, Santa Barbara

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

## Courses

### **GEOG 5003 (4) Elements of Geographic Information Systems**

Discusses incorporating GIS methods into graduate thesis or dissertation research. Reviews basic mapping concepts (scale and projections), acquiring different types of spatial data (raster and vector), building an error-free database, making simple queries, overlays, charts, and maps. Intended for students who want to learn GIS but lack background skills in computing or cartography.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite some experience with Mac or Windows.

**Additional Information:** Departmental Category: GIScience

### **GEOG 5023 (4) Advanced Quantitative Methods for Spatial Data**

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

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4023

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Methods

### **GEOG 5043 (4) Advanced Geovisualization and Web Mapping**

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

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4043

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Methods

### **GEOG 5093 (4) Remote Sensing of the Environment**

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

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

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Methods

### **GEOG 5100 (1-4) Special Topics: Geography**

Covers various topics outside of the normal curriculum; offered intermittently depending on student demand and availability of faculty. **Repeatable:** Repeatable for up to 9.00 total credit hours. Allows multiple enrollment in term.

**Requisites:** Restricted to graduate students only.

### **GEOG 5103 (4) Geographic Information Science: Spatial Analytics**

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

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4103

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: GIScience

### **GEOG 5113 (3) Seminar: Geographic Information Systems**

Focuses on the current research topics in geographical information systems and selected areas of application. Includes major journal articles related to each topic. Students complete and present a seminar paper.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite GEOG 4103 or GEOG 5103 or instructor consent required.

**Additional Information:** Departmental Category: GIScience

### **GEOG 5152 (3) History and Theory of Geography**

History of ideas and institutions that have shaped contemporary geographic inquiry. Examines the evolving relations among human geography, physical geography, environment-society relations, and geographic information processing. Designed to situate graduate student research within major subfields and intellectual currents of geography.

**Requisites:** Restricted to Geography (GEOG) graduate students only.

### **GEOG 5161 (3) Research Design in Geography**

The human section reads and discusses contemporary research philosophies and methodologies in human geography. Practices the development of research proposals and presentation of research ideas and results. The physical section reads and discusses contemporary research philosophies and methodologies in physical geography (climatology, geomorphology, biogeography, and soils geography). Practices the development of research proposals and presentation of research ideas.

**Requisites:** Restricted to Geography (GEOG) graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5203 (4) Geographic Information Science: Spatial Modeling**

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

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4203

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite GEOG 4103 or GEOG 5103 or working knowledge of GIS software or instructor consent required.

**Additional Information:** Departmental Category: Methods

**GEOG 5211 (3) Seminar: Physical Climatology**

Involves a research seminar concerned with problems of mass and energy exchange in the Earth-atmosphere system. Selects topics from such areas as air quality, bioclimatology, hydrology, climate change, and the climates of urban, agricultural, and natural environments.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5221 (3) Synoptic and Dynamic Climatology**

Examines global climates from the standpoint of synoptic and dynamic climatology.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5241 (1-3) Topics in Physical Geography**

Presents recent research topics that vary from year to year. Consult the online Schedule Planner for specific topics.

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

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5251 (4) Fluvial Geomorphology**

Emphasizes landscapes formed by running water. Includes basic fluid mechanics, sediment transport, hillslope and channel erosion, and sediment yield.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4251

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5271 (3) The Arctic Climate System**

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

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4271

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5292 (3) Migration, Immigrant Adaptation, and Development**

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

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4292 and ECON 4292

**Requisites:** Restricted to graduate students only.

**GEOG 5303 (4) Geographic Information Science: Spatial Programming**

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

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4303

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite GEOG 4203/5203.

**Additional Information:** Departmental Category: GIScience

**GEOG 5321 (3-4) Snow Hydrology**

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

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4321

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5331 (3-4) Mountain Climatology**

Surveys and analyzes climatic characteristics of mountain environments worldwide.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4331

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5371 (3) Forest Geography: Principles and Dynamics**

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

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4371

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5391 (3) Seminar: Biogeography**

Considers in detail current research themes in biogeography. Includes intensive reading of current research literature and preparation of research papers. Topics vary.

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

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5401 (3) Soils Geography**

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

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4401

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 5403 (3) Geographic Information Science: Space Time Analytics**

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

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4403

**Requisites:** Restricted to graduate students only.

**GEOG 5463 (3) Earth Analytics Data Science Bootcamp**

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

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4463

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**GEOG 5501 (3) Water Resources and Water Management of Western United States**

Interprets and analyzes hydroclimatic data, surface and groundwater. Critically evaluates water use, emphasizing problems associated with geographic maldistribution, appropriations, irrigation, industry, pollution and regional development.

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4501

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Environment-Society Geography

**GEOG 5503 (3) Geographic Information Science: Project Management**

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

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4503

**Requisites:** Requires prerequisite course of GEOG 5103 (minimum grade C-).

**GEOG 5563 (3) Earth Analytics**

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

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4563

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**GEOG 5603 (3) GIS in the Social and Natural Sciences**

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

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4603

**GEOG 5622 (3) City Life**

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

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4622

**Requisites:** Restricted to graduate students only.

**GEOG 5632 (3) Development Geography**

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

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4632

**Requisites:** Restricted to graduate students only.

**GEOG 5642 (3) Seminar: Urban Geography**

Surveys current research topics in urban geography. Emphasizes definition of possible student thesis topics.

**Requisites:** Restricted to graduate students only.

**GEOG 5652 (3) Introduction to Social Theory**

Surveys theoretical paradigms in the social sciences. Includes canonical works from the history of the social sciences as well as contemporary theorists. Appropriate for beginning to advanced graduate students doing qualitative research.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**GEOG 5662 (3) Seminar: Topics in Economic Geography**

Covers selected topics emphasizing faculty specialties. Topics vary with instructor. Check with department for semester offerings.

**Repeatable:** Repeatable for up to 3.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**GEOG 5663 (3) Earth Analytics Applications**

Develop expertise in finding, organizing, managing and processing large, heterogeneous, spatio-temporal data to address a real-world problem. Students will work collaboratively on semi-guided science project.

Students gain critical skills required to understand data structures, utilize APIs, extract insight from data and understand how uncertainty propagates. Culminates with a formal presentation of project results.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisites GEOG 4463 or GEOG 4563 or GEOG 5463 or GEOG 5563.

**Grading Basis:** Letter Grade

**GEOG 5712 (3) Political Geography**

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

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4712

**Requisites:** Restricted to graduate students only.

**GEOG 5722 (3) Field Methods in Human Geography**

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

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4722

**Requisites:** Restricted to graduate students only.

**GEOG 5732 (3) Population Geography**

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

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4732

**Requisites:** Restricted to graduate students only.



**GEOG 5782 (3) Sustainable Development: Critique**

Investigates historical and contemporary theories and critiques of development and their implications for geographic theory and method. Focuses on the role of representation in evaluating case studies and examining the potential for a sustainable development.

**Requisites:** Restricted to graduate students only.

**GEOG 5832 (3) Geography of Tibet**

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

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4832

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Asia Content

**GEOG 5840 (1-3) Graduate Independent Study**

Offers independent research for master's students only. Instructor consent required.

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

**Requisites:** Restricted to graduate students only.

**GEOG 5842 (3) Global Frontiers in Southeast Asia**

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

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

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Letter Grade

**GEOG 5852 (3) Health and Medical Geography**

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

**Equivalent - Duplicate Degree Credit Not Granted:** GEOG 4852

**Requisites:** Restricted to graduate students only.

**GEOG 5930 (3) Advanced Internship**

Provides an academically supervised opportunity for graduate-level geography majors to work in public and private organizations on advanced projects related to geographic theory and their career goals. Instructor consent required.

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

**Requisites:** Restricted to graduate students only.

**GEOG 5961 (3) Theories of Climate and Climate Variability**

Critically reviews current theories of climatic variability based on analysis of the different physical processes affecting climate.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 6180 (1-3) Seminar: Geographic Problems**

Applies research methods to selected problems. Topics vary with instructor.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**GEOG 6211 (1-3) Readings in Climatology**

Discusses selected topics in current climatological literature. Specific themes vary.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**Additional Information:** Departmental Category: Physical Geography

**GEOG 6402 (3) Seminar: Political Ecology**

Critically examines the politics of human-environment relationships across cultures and societies. Focuses on environmental degradation, change and management from the perspectives including political economy, cultural politics, STS and post structural theory.

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

**Requisites:** Restricted to graduate students only.

**GEOG 6712 (3) Seminar: Political Geography**

Considers in detail history and methodology of the field, including an analysis of selected systematic topics such as frontiers and boundaries, international rivers, conflicting claims to territory, and electoral geography.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**GEOG 6732 (3) Formal Population Geography: Analysis and Forecasting**

In-depth introduction to formal demography. In addition to learning the basic demographic tools used nowadays in fertility, marriage, mortality, migration and forecasting/projections, it also looks at some potential links between formal and statistical demographic work that would enable the student to apply some of the methods learnt in an econometric or multivariate setting.

**Requisites:** Restricted to graduate students only.

**Recommended:** Prerequisite GEOG 5023.

**GEOG 6742 (3) Seminar: Cultural Geography**

Explores various geographic topics emphasizing the concept of culture. Emergence of several points of view in the development of cultural geography.

**Repeatable:** Repeatable for up to 7.00 total credit hours.

**Requisites:** Restricted to graduate students only.

**GEOG 6940 (1) Master's Candidate for Degree**

Instructor consent required.

**Requisites:** Restricted to graduate students only.

**Grading Basis:** Pass/Fail

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

Instructor consent required.

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

**Requisites:** Restricted to graduate students only.

**GEOG 7840 (1-3) Graduate Independent Study**

Offers independent research for doctoral students only. Instructor consent required.

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

**Requisites:** Restricted to graduate students only.

**GEOG 8990 (1-10) Doctoral Dissertation**

All doctoral students must register for not fewer than 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section. Instructor consent required.

**Repeatable:** Repeatable for up to 30.00 total credit hours.

**Requisites:** Restricted to graduate students only.