

GEOGRAPHY (GEOG)

GEOG 1. Atmosphere, Landscapes & Life: Intro to Physical Geography. 3 Units

General Education Area/Graduation Requirement: Physical Science (5-A)
Term Typically Offered: Fall, Spring, Summer

This course provides an overview of Earth's physical systems, including the atmosphere, biosphere, hydrosphere, and lithosphere. Topics covered include weather and climate, biological systems, plate tectonics, volcanoes and earthquakes, and weathering and erosion. Emphasis is placed on the role of humans in influencing Earth's physical systems.

GEOG 2. Cultural Geography. 3 Units

General Education Area/Graduation Requirement: Social and Behavioral Sciences (4-A)

Term Typically Offered: Fall, Spring

Consideration of the diversity of patterns of land use, settlement and movement established and evolved by humans as a result of the interaction of cultural and physical factors; emphasis on student use of maps and other tools of geographic presentation for analyzing the nature, variation and distribution of cultural features of the earth's surface.

GEOG 2H. Cultural Geography - Honors. 3 Units

Prerequisite(s): Open to Honors students only.

General Education Area/Graduation Requirement: Social and Behavioral Sciences (4-A)

Term Typically Offered: Fall, Spring, Summer

Consideration of the diversity of patterns of land use, settlement and movement established and evolved by humans as a result of the interaction of cultural and physical factors; emphasis on student use of maps and other tools of geographic presentation for analyzing nature, variation and distribution of cultural features of the earth's surface.

Note: This is a special offering designed as part of the G.E. Honors program.

GEOG 3. Introduction to Maps and Geographic Technologies. 3 Units

Term Typically Offered: Fall, Spring

Introduction to maps, map concepts, and geographic technologies. Maps are the most effective way to communicate spatial data, and introduces students to the quickly changing world of maps (both hard-copy and digital) and geographic technologies including map and aerial photograph interpretation, spreadsheet operations, introductory statistics, global positioning systems (GPS), Internet mapping, satellite and aerial images, and geographic information systems (GIS) that aid in data collection, analysis, and presentation. Lecture two hours; laboratory two hours.

GEOG 4. Global Urbanism: Cities and World Regions. 3 Units

General Education Area/Graduation Requirement: Social and Behavioral Sciences (4-A)

Term Typically Offered: Fall, Spring

Examination of cities and urban processes across the globe. Emphasizes comparative approaches to understanding the urban condition using examples from world regions. Social, cultural, political, and historical dimensions of urban life are considered.

GEOG 5. Violent Weather/Changing Atmosphere. 3 Units

General Education Area/Graduation Requirement: Physical Science (5-A)

Term Typically Offered: Fall, Spring

Introduction to meteorological and climatological principles and concepts. These principles will be used to examine severe atmospheric phenomena, including hurricanes, tornadoes, thunderstorms, lightning, destructive winds, severe storms, heat waves, droughts and floods, particularly in relation to human-caused climate change and the effects of these phenomena on humanity.

GEOG 11. Laboratory in Physical Geography. 1 Unit

Prerequisite(s): GEOG 1; may be taken concurrently.

General Education Area/Graduation Requirement: Laboratory (5-C), Physical Science (5-A)

Term Typically Offered: Fall, Spring, Summer

Makes the ideas and relationships of introductory physical geography more clear by observation and experiment. Use is made of maps, globes, models, meteorological instruments and records, satellite photos and observations of the local scene. Laboratory, three hours.

GEOG 100. Themes In World Geography. 3 Units

Prerequisite(s): Junior or Senior class standing or instructor permission.

Term Typically Offered: Fall, Spring

Study of the content of geography with a consideration of basic concepts and methods. Emphasis is on patterns and relationships of the elements and manifestations of physical and cultural geography, including both topical and regional discussions.

GEOG 102. Ideas and Skills in Geography. 3 Units

Prerequisite(s): GEOG 1 or GEOG 2 or GEOG 3 or GEOG 11.

Term Typically Offered: Fall only

Study and discussion of geographic ideas, including the history of the discipline. Introduction to library resources appropriate to geographic inquiry. Practice in geographic descriptive and analytical writing and research. Extensive use of maps. Required of Geography majors in the junior year. Lecture three hours.

GEOG 105. Cartography. 3 Units

Term Typically Offered: Spring only

Introduction to principles map design for the digital era. Use of illustration software for the production of printed and electronic maps, and other visualizations of spatial information. Theory and history of cartography, including color theory, map projections, visual variables and cartographic scale. Lecture two hours; laboratory three hours.

GEOG 107. Remote Sensing. 3 Units

Term Typically Offered: Fall only

Aerial photographs and scanned satellite images, emphasis on the former. Topics include the electromagnetic spectrum, cameras, films, image geometry as related to planimetric and topographic mapping, multispectral techniques, and interpretation of imagery, emphasizing land use and landforms. Lecture two hours; laboratory three hours.

GEOG 109. Geographic Information Systems. 3 Units

Term Typically Offered: Fall, Spring, Summer

Introduction to GIS, including history and overview of current applications; the nature of spatial data; geographic data structures, acquisition, analysis, and display of geographic data. Lab exercises use various computers and include both raster- and vector-based GIS systems. Lecture two hours; laboratory three hours.

<p>GEOG 110. Spatial Analysis in GIS. 3 Units Prerequisite(s): GEOG 109 or instructor permission. Paired with GEOG 210. Term Typically Offered: Spring only</p> <p>Focus on core raster and vector analytical functions within GIS needed by a beginning GIS analyst. Students will acquire conceptual understanding of these functions, and the technical ability to apply them within industry-standard GIS software.</p>	<p>GEOG 118. Earth Transformed. 3 Units Term Typically Offered: Fall, Spring</p> <p>Explores the evolving human role in transforming Earth's physical environments. Topics range from prehistoric extinction's to modern environmental problems in select regions. Emphasis is placed on wide-ranging effects of resource use and disposal, with particular reference to atmosphere and biological problems and sustainable solutions.</p>
<p>GEOG 111. Elements Of Meteorology. 3 Units Prerequisite(s): GEOG 1 or instructor permission. General Education Area/Graduation Requirement: Physical Science (5-A) Term Typically Offered: Fall, Spring</p> <p>Basic concepts of weather and weather elements: structure and general circulation of the atmosphere, earth's heat and water balance, precipitation, air masses and fronts, air pollution meteorology. Some micrometeorological concepts with application to air pollution, agriculture, and similar problems.</p>	<p>GEOG 119. Visualizing Global Environments. 3 Units General Education Area/Graduation Requirement: Physical Science (5-A) Term Typically Offered: Fall, Spring</p> <p>Using current geospatial technologies, such as remote sensing and GIS, the course provides an introduction to the distributions of climate, plant cover, soils, and landforms over the face of the earth. While examining processes and conditions that cause these distributions, students will also explore the methods and techniques that let us visualize these distributions, and use maps as communicative devices in our explorations of these topics.</p>
<p>GEOG 113. Climate. 3 Units General Education Area/Graduation Requirement: Physical Science (5-A) Term Typically Offered: Fall, Spring</p> <p>Study of the distribution of heat and moisture over the earth's surface. Basic processes by which heat and moisture acquire unequal distributions in space and time. Classification of climate. Climatic change. Climate models.</p>	<p>GEOG 121. United States and Canada. 3 Units Term Typically Offered: Fall, Spring</p> <p>Present distribution and historical development of population, land use and industry in the U.S. and Canada in relation to regional variations in the physical environment and cultural heritage.</p>
<p>GEOG 115. Biogeography. 3 Units Prerequisite(s): GEOG 1 or instructor permission General Education Area/Graduation Requirement: Physical Science (5-A) Term Typically Offered: Fall only</p> <p>Introduction to the geographic distribution of life. Communities and biomes, changing continents and climates, dispersal, colonization, extinction, life on islands, and past and present human impacts are examined. Note: Field trip required.</p> <p>Field trip(s) may be required.</p>	<p>GEOG 127. Geography Of Africa. 3 Units Term Typically Offered: Fall only – even years</p> <p>Emphasis is on sub-Saharan Africa with consideration given to selected topics such as population problems, industrialization, regional groupings, transportation, and internal and external relationships.</p>
<p>GEOG 116. Global Climate Change. 3 Units Prerequisite(s): GEOG 1 or instructor permission. General Education Area/Graduation Requirement: Physical Science (5-A) Term Typically Offered: Fall, Spring</p> <p>Study of past climate change and the techniques with which they are reconstructed. Focus on the various temporal scales at which climate change operates. Spatial variability of past, present and future climate changes. Anthropogenic climate change in the context of natural climate variability.</p>	<p>GEOG 128. Geography Of Europe. 3 Units Term Typically Offered: Spring only – even years</p> <p>Survey of Europe with emphasis on its physical environment, contemporary demographic, economic, and ethnic patterns, and the changing political landscape. Consideration will also be given to Europe's historic and present-day links with other world regions, and to the geographic basis for many of the social, political, economic, and environmental challenges facing contemporary Europe.</p>
<p>GEOG 117. Landforms. 3 Units Prerequisite(s): GEOG 1 or instructor permission. Term Typically Offered: Spring only</p> <p>Study of the surface forms of the land with particular attention to their distribution and to the accompanying distribution of natural forces and processes which have brought the landforms into being. Study of landforms in the context of Quaternary environmental change. Identification and analysis of landforms using maps and other spatial data. Lecture three hours.</p>	<p>GEOG 129A. Special Topics in Regional Geography A. 3 Units Term Typically Offered: Fall only – odd years</p> <p>Geographic survey of a selected region with emphasis on its physical environment and selected economic, demographic, political, and cultural patterns. Consideration may include its connection to other world regions and its role in current events. The specific region is identified by the Geography Department at scheduling. This course and GEOG 129B and GEOG 129C may be taken for up to 9 units.</p>
	<p>GEOG 129B. Special Topics in Regional Geography B. 3 Units Term Typically Offered: Fall only – odd years</p> <p>Geographic survey of a selected region with emphasis on its physical and human geography. Topics may include climate, landforms, vegetation, economics, demographics, culture, and the region's connection to other world regions and its role in current events. The specific region is identified by the Geography Department at scheduling. This course and GEOG 129A and GEOG 129C may be taken for up to 9 units.</p>

GEOG 129C. Special Topics in Regional Geography C. 3 Units
Term Typically Offered: Fall only – odd years

A selected world region is the focus of this course that geographically surveys the region’s physical and human environment. Potential topics include climate, landforms, vegetation, economics, demographics, culture, and more. The specific region is identified by the Geography Department at scheduling. This course and GEOG 129A and GEOG 129B may be taken for up to 9 units.

GEOG 131. California. 3 Units
Term Typically Offered: Fall only

Study of landforms, climate, vegetation, population distribution and change, industry, transportation, water, energy, and agriculture in California.

GEOG 133. Geography of the Middle East and North Africa. 3 Units
General Education Area/Graduation Requirement: Humanities (3-B)
Term Typically Offered: Fall, Spring

This course offers an in-depth exploration of the Middle East and North Africa, focusing on the region’s diverse geography, social structures, cultural heritage, and dynamic political landscapes. We will study how the cultural landscape, historical trajectories, and socio-political developments have shaped and continue to influence the lives of millions in the region. Students also critically engage with key geopolitical issues among states and within societies. We will be reading and discussing several short biographical literatures to help us gain a more humanized perspective of people’s everyday lives in the region.

GEOG 141. Geography of Economic Activity. 3 Units
Term Typically Offered: Fall only – even years

Spatial organization of man’s activities related to production, exchange and consumption. Attention is given to resource development and the areal variations of factors affecting it, to concepts of spatial interaction and to spatial aspects of agricultural, industrial and urban land use. An examination of problems related to regional economic development. Changing perceptions of spatial organization of economic activities is also considered. Emphasis is on both theoretical framework and case study applications.

GEOG 142. Feminist Geography. 3 Units
Term Typically Offered: Fall only – even years

Feminist geography has long aimed to unbind geography, asking challenging questions about who geographers are, and what counts as geographic theory and practice, which spaces geographers study, and whose spaces inform theory. In this course we bring the feminist project into the classroom by exploring the work of feminist geographers who seek to challenge the embedded whiteness in our field. We also aim to incorporate the decolonial practices to transform the geographic scholarship in an international and multi-disciplinary context.

GEOG 143. Environmental Hazards and Society. 3 Units
General Education Area/Graduation Requirement: Social and Behavioral Sciences (4-A)

Term Typically Offered: Spring only – even years

Traditional views of hazards focus on the processes associated with natural or technological systems. But societal choices shape the occurrence and differential impact of hazard events. This course focuses on the intersection between physical and social systems that create hazards. We consider the development of various theoretical understandings of hazards; individual and societal responses to hazards; the history of U.S. disaster response; how socio-economic and demographic factors shape differential hazard and disaster impacts, and approaches to hazard vulnerability assessment.

GEOG 144. Transforming the City. 3 Units
Term Typically Offered: Fall only – odd years

Examination of dynamic urban social, spatial, and political forces related to housing, gentrification, and public space. Attention is given to the roles of class, race, gender, and ethnicity in shaping the spaces and processes of urban transformation in cities across the world. Guest speakers, written assignments, and discussions complement weekly lectures.

GEOG 145. Population Geography. 3 Units
General Education Area/Graduation Requirement: Social and Behavioral Sciences (4-A)

Term Typically Offered: Spring only – even years

Spatial patterns of population numbers and characteristics; migration and spread of ideas; potential for economic and cultural developments.

GEOG 147. Urban Geography. 3 Units
Term Typically Offered: Spring only – even years

Consideration of cities as centers of human activity from the rise of urban life in the Old and New Worlds to the present day patterns of metropolis and megalopolis. The functions and interactions of cities in Earth’s limited space and on Earth’s limited resources are studied historically and crossculturally. Also examined are changing perceptions of the urban phenomenon and attempts to enhance the quality of urban life.

GEOG 148. Urban and Regional Planning. 3 Units
Term Typically Offered: Spring only – even years

Introduction to the theory and practice of urban and regional planning. Topics include the history of planning, the development of comprehensive and land use plans, growth management, and transportation and environmental planning. Includes guest speakers from the planning community as well as the opportunity to work on a project with a community organization or government agency to put into practice what is discussed in class.

GEOG 149. Transportation Geography. 3 Units

Prerequisite(s): GEOG 141, GEOG 147, or GEOG 148 or instructor permission.

Term Typically Offered: Spring only – odd years

Explores the geography of transportation using both theory and applications, quantitative and qualitative methods. Topics include the history and economic importance of transportation systems for all major modes; their political, social, and environmental aspects; and basic analytical methods, including accessibility dynamics, network analysis, and spatial interaction models. Focus will be on the U.S., with frequent reference to local issues, though material will be drawn on from around the world.

GEOG 150. Programming for GIS. 3 Units Term Typically Offered: Fall only	GEOG 181. Quantitative Methods in Geography. 3 Units Term Typically Offered: Fall only
<p>This course is an introduction to programming, data pre-processing/manipulation, and geoprocessing using procedural and object-oriented programming approaches. You will develop programmatic thinking skills and write clearly documented & structured custom geoprocessing solutions using the Python programming language. Paired with GEOG 250.</p>	<p>Introduction to techniques useful in the analysis of spatial distributions and other geographic phenomena: basic aspatial descriptive and inferential techniques, correlation, regression, and spatial inferential techniques.</p>
GEOG 151. Programming for GIS II. 3 Units Prerequisite(s): GEOG 150 or instructor approval. Term Typically Offered: Spring only – even years	GEOG 182. Qualitative Methods in Geography. 3 Units Term Typically Offered: Spring only
<p>This is an advanced course in programming and scripting for intermediate to advanced GIS users, using an object-oriented programming approach. You will develop well-documented and structured geoprocessing programs for data management, processing, and automation in the Python programming language, leveraging libraries such as ArcPy and GDAL.</p>	<p>Students learn and conduct an array of observational and qualitative research techniques used in human geography, including landscape observation, participant observation, interviews, surveys and questionnaires, group discussions (focus groups, charrettes, etc.), visual methods, archival research, and analyzing some of the writing styles commonly used in qualitative research. One learns the relative strengths and weaknesses of these techniques, their appropriate applications, ways to combine them in mixed-methods research, and how to analyze and represent the data.</p>
GEOG 155. GIS Data Acquisition and Management. 3 Units Prerequisite(s): GEOG 109 or GEOG 209 or instructor consent. Paired with GEOG 255. Term Typically Offered: Fall, Spring	GEOG 190. Senior Research Seminar in Geography.  3 Units Prerequisite(s): GEOG 1, GEOG 2, GEOG 3, GEOG 102; Senior standing; a WPJ Portfolio score OR ENGL 109M or ENGL 109W General Education Area/Graduation Requirement: Writing Intensive Graduation Requirement (WI) Term Typically Offered: Spring only
<p>This course focuses on acquisition and management of geospatial datasets and addresses the interpretation of a variety of data formats available in global information systems (GIS). It explores concepts of geospatial data management strategies, primary GIS data creation, secondary data acquisitions, and leveraging leading-edge geospatial data deployments.</p>	<p>Writing-intensive capstone course requiring students to complete independent research projects displaying their mastery of geography's content and methods. Projects undertaken in a given semester share a common thematic and/or regional focus. Students use bibliographic, field, spatial analytic, graphic, and verbal skills. Context for projects is provided by a review of the recent history of the discipline. Lecture/discussion three hours.</p>
GEOG 161. California's Water Resources. 3 Units Term Typically Offered: Spring only	GEOG 192A. Geography Field Experience A. 1 - 2 Units Prerequisite(s): one geography course or instructor permission. Term Typically Offered: Fall, Spring
<p>Study of the location and nature of the state's surface and underground water, including development by government agencies, water needs of cities, farms, recreation and wildlife, implications of water rights, water marketing and conservation, and management of floods, droughts and pollution.</p>	<p>A particular geographical area is explored and studied via beginning-level field observation. Emphasis may be placed on physical features, cultural features, or both. Credit/No Credit</p>
GEOG 163. Applied GIS. 3 Units Prerequisite(s): GEOG 109. Term Typically Offered: Fall only	GEOG 192B. Geography Field Experience B. 1 - 2 Units Prerequisite(s): one geography course or instructor permission. Term Typically Offered: Fall, Spring
<p>GIS-based research methods and project management. Development of project proposals, data collection plans, and other research techniques in a group and/or individual setting. Readings and lab exercises build on previous GIS skills. Lecture 2 hours; Laboratory 3 hours.</p>	<p>A particular geographical area is explored and studied via intermediate-level field observation. Emphasis may be placed on physical features, cultural features, or both. Credit/No Credit</p>
GEOG 164. Political Ecology, Nature, and Justice. 3 Units Term Typically Offered: Fall only – odd years	GEOG 192C. Geography Field Experience C. 1 - 2 Units Prerequisite(s): one geography course or instructor permission. Term Typically Offered: Fall, Spring
<p>This course will provide an overview of political ecology, a growing field in geography that examines political, social, and economic inequalities in human-environment interactions. Students will develop advanced critical thinking skills related to real-world socio-environmental problems. The course will introduce major debates, scholarly intersections, and particular themes in contemporary political ecology research, including a discussion of urban environmental issues, gendered and racialized inequalities, water politics, climate justice, and food sovereignty.</p>	<p>A particular geographical area is explored and studied via advanced-level field observation. Emphasis may be placed on physical features, cultural features, or both. Credit/No Credit</p>

<p>GEOG 193A. Field Geography: Urban-Metropolitan. 3 Units Prerequisite(s): Instructor permission Term Typically Offered: Spring only – odd years</p> <p>Examines the internal structure and external relations of Sacramento as a metropolitan center and of nearby urban communities through field observation and exercises. Emphasis is placed on mapping and interviewing as ways of gaining useful information on urban patterns.</p> <p>GEOG 193B. Field Geography: Suburban-Rural. 3 Units Prerequisite(s): Instructor permission. Term Typically Offered: Spring only – even years</p> <p>Examines competition for land use in suburban Sacramento as urban sprawl overruns less intensive uses. Small towns in the lower Sacramento Valley also examined. Group field trips, interviews, field mapping and discussions. Field trip(s) may be required.</p> <p>GEOG 193C. Field Geography: Physical. 3 Units Prerequisite(s): Instructor permission. Term Typically Offered: Fall only – even years</p> <p>Survey of selected areas with systematic examination of elements of the natural landscape. Group field trips and individual preparation of reports and consultation with instructor. Field trip(s) may be required.</p> <p>GEOG 194. Geography - Related Work Experience. 6 - 12 Units Prerequisite(s): Consent of supervising faculty and Department Chair. Term Typically Offered: Fall, Spring</p> <p>Supervised employment in a company or agency doing geography-related work, arranged through the Department of Geography and the Cooperative Education Program office. Requires preparation of application packet, completion of a 3-6 month full- or part-time work assignment, and a written report. Units not applicable to the Geography major. Credit/No Credit</p> <p>GEOG 195A. Geography Internship A. 1 - 3 Units Term Typically Offered: Fall, Spring</p> <p>Supervised work experience at the beginning level in an approved professional environment, working with professionals in public or private organizations. Supervision supplied by a geography faculty member and on-site supervisor. Placements require 4-12 hours per week, depending on units. Note: Open to all Geography majors and minors with permission of supervising faculty member and Department Chair. GEOG 195A, GEOG 195B, and GEOG 195C may be taken for up to 6 total units.</p> <p>Credit/No Credit</p> <p>GEOG 195B. Geography Internship B. 1 - 3 Units Term Typically Offered: Fall, Spring</p> <p>Supervised work experience at an intermediate level in an approved professional environment, working with professionals in public or private organizations. Supervision supplied by a geography faculty member and on-site supervisor. Placements require 4-12 hours per week, depending on units. Note: Open to all Geography majors and minors with permission of supervising faculty member and Department Chair. GEOG 195A, GEOG 195B, and GEOG 195C may be taken for up to 6 total units.</p> <p>Credit/No Credit</p>	<p>GEOG 195C. Geography Internship C. 1 - 3 Units Term Typically Offered: Fall, Spring</p> <p>Supervised work experience at an advanced level in an approved professional environment, working with professionals in public or private organizations. Supervision supplied by a geography faculty member and on-site supervisor. Placements require 4-12 hours per week, depending on units. Note: Open to all Geography majors and minors with permission of supervising faculty member and Department Chair. GEOG 195A, GEOG 195B, and GEOG 195C may be taken for up to 6 total units.</p> <p>Credit/No Credit</p> <p>GEOG 196F. Feminist Geography. 3 Units Term Typically Offered: Fall, Spring, Summer</p> <p>In this course we bring the feminist project in to the classroom by exploring the work of feminist geographers who seek to challenge the embedded whiteness in our field. We also aim to incorporate the decolonial practices to transform the geographic scholarship in an international and multi-disciplinary context.</p> <p>GEOG 196N. Geography of Natural Resources. 3 Units Term Typically Offered: Spring only</p> <p>Study of the physical aspects of natural resources including how those aspects influence the spatial distribution, methods of detecting and analyzing, and challenges to human use. Emphasis on the inherent tradeoffs in land use decisions when humans utilize resources.</p> <p>GEOG 196Z. California Burning: Wildfires, Climate, and Biodiversity. 3 Units Term Typically Offered: Spring only – odd years</p> <p>Wildfires are not just events, they are ecological phenomena that shape landscapes and livelihoods. This introductory course uncovers the dynamic interplay between wildfires, climate, biodiversity, and California's geography. Students will explore the science behind wildfires, the resilience of California's flora and fauna to fire, the consequences of management strategies from the pre-Columbian era to today, and map wildfire effects and risks. Lecture three hours.</p> <p>GEOG 198. Co-Curricular Activities. 1 - 6 Units Prerequisite(s): Consent of faculty Sponsor and department chair. Term Typically Offered: Fall, Spring</p> <p>Co-curricular activities related to subject matter and concerns of the Geography Department, e.g. students may qualify for credit by providing special tutorial assistance to EOP students or others in introductory courses. Note: May be repeated for up to 6 units of credit.</p> <p>Credit/No Credit</p> <p>GEOG 199. Special Problems. 1 - 3 Units Prerequisite(s): Approval of the faculty sponsor and Department chair. Term Typically Offered: Fall, Spring, Summer</p> <p>Individual projects or directed reading. Note: Open only to students competent to carry on individual work.</p> <p>Credit/No Credit</p>
---	--

GEOG 199A. Geography Special Problems A. 1 - 3 Units**Prerequisite(s):** Approval of the faculty sponsor and department chair.**Term Typically Offered:** Fall, Spring

Individual projects or directed reading at a beginning level. Graded (CR/NC Available) Units: 1.0 - 3.0

Note: Open only to students competent to carry on individual work.

Credit/No Credit

GEOG 199B. Geography Special Problems B. 1 - 3 Units**Prerequisite(s):** Approval of the faculty sponsor and department chair.**Term Typically Offered:** Fall, Spring

Individual projects or directed reading at an intermediate level, ordinarily taken following completion of GEOG 199A. Graded (CR/NC Available) Units: 1.0 - 3.0

Note: Open only to students competent to carry on individual work.

Credit/No Credit

GEOG 199C. Geography Special Problems C. 1 - 3 Units**Prerequisite(s):** Approval of the faculty sponsor and department chair.**Term Typically Offered:** Fall, Spring

Individual projects or directed reading at an advanced level. Ordinarily taken following completion of GEOG 199A and GEOG 199B. Graded (CR/NC Available) Units: 1.0 - 3.0

Note: Open only to students competent to carry on individual work.

Credit/No Credit

GEOG 209. Geographic Information Systems. 3 Units**Term Typically Offered:** Fall, Spring, Summer

Introduction to GIS, including history and overview of current applications; spatial data collection, components, and input; production of maps; and basic analytical functions. Lab exercises emphasize practical GIS analysis skills and software features. Graduate students in GEOG 209 perform additional work. Paired with GEOG 109. Students cannot enroll in this course if they have received credit for GEOG 109.

GEOG 210. Spatial Analysis in GIS. 3 Units**Prerequisite(s):** GEOG 109/209 or instructor consent. Paired with GEOG 110. Students cannot enroll in this course if they have received credit for GEOG 110.**Term Typically Offered:** Spring only

Focus on core raster and vector analytical functions within GIS needed by a beginning GIS analyst. Students will acquire conceptual understandings of these functions, and the technical ability to apply them within industry-standard GIS software. Course intended for graduate students only.

GEOG 250. Programming for GIS. 3 Units**Prerequisite(s):** Graduate standing. Paired with GEOG 150. Students cannot enroll in this course if they have received credit for GEOG 150.**Term Typically Offered:** Fall only

This course is an introduction to programming, data pre-processing/manipulation, and geoprocessing using procedural and object-oriented programming approaches. You will develop programmatic thinking skills and write clearly documented & structured custom geoprocessing solutions using the Python programming language. Course intended for graduate students only.

GEOG 255. GIS Data Acquisition and Management. 3 Units**Prerequisite(s):** GEOG 109 or GEOG 209 or instructor consent. Paired with GEOG 155. Students cannot enroll in this course if they have received credit for GEOG 155.**Term Typically Offered:** Fall, Spring

This course focuses on acquisition and management of geospatial datasets and addresses the interpretation of a variety of data formats available in global information systems (GIS). It explores concepts of geospatial data management strategies, primary GIS data creation, secondary data acquisitions, and leveraging leading-edge geospatial data deployments (for graduate students only).

GEOG 299. Special Problems. 1 - 3 Units**Prerequisite(s):** Approval of the faculty sponsor and Department Chair.**Term Typically Offered:** Fall, Spring

Individual projects or directed reading.

Note: Open only to students competent to carry on individual work.

Credit/No Credit