Geography

Overview

Geography is the science of place and space. Geographers study the relationships among geographic places, natural systems, society, cultural activities, and the interdependence of all these over space.

Program Maps

- Geography, A.S. Degree ([/crc/main/doc/programs/program-maps/geog-as-degree-ho.pdf])
- Geography, A.A.-T Degree ([/crc/main/doc/programs/program-maps/geog-aa-t-degree-ho.pdf])
- Geography, A.A.-T Degree, IGETC ([/crc/main/doc/programs/program-maps/geog-aa-t-degree-ho-igetc.pdf])
- Geography, Environmental Studies and Sustainability, A.S. Degree ([/crc/main/doc/programs/program-maps/geog-env-studies-sustainability-as-degree-ho.pdf])
- Geography, Sustainability, Certificate of Achievement ([/crc/main/doc/programs/program-maps/geog-sustainability-cert-ho.pdf])

Dean: Banafsheh Amini ([/about-us/contact-us/faculty-and-staff-directory/banafsheh-amini])
Department Chair: Scott Crosier ([/about-us/contact-us/faculty-and-staff-directory/scott-crosier])
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Email: AminiB2@crc.losrios.edu (mailto:AminiB2@crc.losrios.edu)

Associate Degrees for Transfer

A.A.-T. in Geography

Geography is the science of place and space. Geographers study the relationships among geographic places, natural systems, society, cultural activities, and the interdependence of all these over space.

There are two main branches of geography: human geography and physical geography. Human geography is concerned with the spatial aspects of human existence – how people and their activities are distributed in space, how people use and perceive space, and how people create and sustain the places that make up Earth’s surface. Physical geographers study the physical elements and spatial processes that make up and shape the environment, including energy, air, water, weather, climate, landforms, soils, animals, plants, etc. Many human and physical geographers have skills in cartography and Geographic Information Systems (GIS).

Geographers also study the linkages between human activity and natural systems. Geographers were, in fact, among the first scientists to sound the alarm that human-induced changes to the environment were beginning to threaten the balance of life itself. Geographers today are active in the study of global warming, desertification, deforestation, loss of biodiversity, groundwater pollution, flooding, and more.

The Associate in Arts in Geography for Transfer Degree (AA-T) is designed to provide a seamless transfer pathway for students interested in pursuing a Geography degree in the California State University (CSU) system. The required and elective coursework surveys a broad spectrum of physical geography, human geography, geospatial technologies (e.g. GIS, the Global Positioning System, remote sensing), and related disciplines. The degree is comprised of lower division coursework typically required by CSU institutions. Students must complete a total of 60 transferable semester units with a minimum 2.0 GPA, to include either the California State University General Education Breadth pattern or the Intersegmental General Education Transfer Curriculum; students must also earn a grade of C or better in all the courses for the major as described in the Required Program. Upon successful completion of the degree requirements, students will be guaranteed admission to the CSU system with junior status and will not have to repeat lower division coursework. Students are encouraged to meet with a counselor to develop their educational plans as degree options and general education requirements vary for each university.

Catalog Date: June 1, 2020

Degree Requirements

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<thead>
<tr>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>UNITS</th>
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<tbody>
<tr>
<td>Core:</td>
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<tr>
<td>GEOG 300</td>
<td>Physical Geography: Exploring Earth's Environmental Systems</td>
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<td>Geography of California (3)</td>
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<td>GEOG 335</td>
<td>Introduction to Geographic Information Systems Application (3)</td>
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<td>GEOG 391</td>
<td>Field Studies in Geography: Mountain Landscapes (1 - 4)</td>
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<tr>
<td>GEOG 392</td>
<td>Field Studies in Geography: Coastal Landscapes (1 - 4)</td>
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</table>
The coursework examines the interplay between natural and social systems, and the ideological foundations of humankind's attitudes and behaviors with respect to their ever-changing environment. This program is designed to prepare students to research, analyze, and propose solutions to the myriad environmental challenges facing the world today.

This degree is designed to correlate with the lower division courses required to transfer into an Environmental Studies program at many four-year institutions as well as provide broad-based environmental education for transfer in related disciplines.

The disciplines of environmental studies and geography are complementary fields, both focused on aspects of human-environment interaction. This complementarity is reflected in the many 4-year institutions that house combined Geography and Environmental Study programs. Students interested in double-majoring in these two closely-related disciplines, and/or simultaneously earning a Certificate in Geographic Information Systems, are encouraged to examine the required coursework and plan their program of study accordingly.

Students interested in pursuing an Environmental Science major should consult with science faculty and counselors to tailor the specific coursework necessary to transfer to the 4-year institution of their choice.

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<th>COURSE CODE</th>
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<tr>
<td>BIOL 350</td>
<td>Environmental Biology (3)</td>
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Student Learning Outcomes

Upon completion of this program, the student will be able to:

- Demonstrate understanding of the global natural and cultural environments and the geographic methods by which they are studied. (PSLO1)
- Compare and contrast the general biophysical and socio-cultural differences and similarities among world regions that operate through time and over space. (PSLO2)
- Evaluate and analyze critical geographic issues facing the world today. (PSLO3)
- Recognize the diversity of peoples, places, and events globally as well as within specific geographic regions. (PSLO4)
- Interpret maps and mapped data utilizing basic map elements, including scales, common coordinate systems, and map symbols. (PSLO5)
- Use a computer effectively to research, map, and analyze geographic information. (PSLO6)
- Compare and contrast common geographic technologies such as geographic information systems (GIS) and the global positioning system (GPS). (PSLO7)
- Communicate geographic information effectively in oral, written, and graphic form. (PSLO8)

Career Information

The AA-T in Geography provides students with the foundational knowledge necessary for transfer to a 4-year Bachelor of Arts (BA) degree program. Career opportunities for geographers are as varied as the scope of geography itself. Geographers are found throughout the public and private sector, though rarely in positions with the title of "Geographer." When combined with appropriate internships and/or other work experience, a baccalaureate degree in geography is excellent preparation for careers in Natural Resource Management, Environmental Conservation; International Development; Urban and Regional Planning; Education (K-12 through University); Tourism; International Business; Cartography; Climatology; Transportation Planning; Real Estate; International Business; Marketing; Land Surveying; Demography; and many other fields. Some careers may require additional training. NOTE TO TRANSFER STUDENTS: The Associate Degree for Transfer program is designed for students who plan to transfer to a campus of the California State University (CSU). Other than the required core, the courses you choose to complete this degree will depend to some extent on the selected CSU for transfer. In addition, some CSU-GE Breadth or IGETC requirements can also be completed using courses required for this associate degree for transfer major (known as "double-counting"). Meeting with a counselor to determine the most appropriate course choices will facilitate efficient completion of your transfer requirements. For students wishing to transfer to other universities (UC System, private, or out-of-state), the Associate Degree for Transfer may not provide adequate preparation for upper-division transfer admissions; it is critical that you meet with a CRC counselor to select and plan the courses for the major, as programs vary widely in terms of the required preparation. Students planning to transfer to a CSU are strongly advised to take GEOG 391 (Exploring Maps and Geographic Technologies) because it is a required lower-division course at many campuses, including CSU Sacramento.

Associate Degrees

A.S. in Environmental Studies & Sustainability

The Environmental Studies & Sustainability Associate of Science degree is an interdisciplinary and multidisciplinary program of study that presents a broad overview of ecological issues from a variety of perspectives in the natural, physical, and social sciences. The coursework examines the interplay between natural and social systems, and the ideological foundations of humankind's attitudes and behaviors with respect to their ever-changing environment. This program is designed to prepare students to research, analyze, and propose solutions to the myriad environmental challenges facing the world today.

This degree is designed to correlate with the lower division courses required to transfer into an Environmental Studies program at many four-year institutions as well as provide broad-based environmental education for transfer in related disciplines.

The disciplines of environmental studies and geography are complementary fields, both focused on aspects of human-environment interaction. This complementarity is reflected in the many 4-year institutions that house combined Geography and Environmental Study programs. Students interested in double-majoring in these two closely-related disciplines, and/or simultaneously earning a Certificate in Geographic Information Systems, are encouraged to examine the program of study and plan their program of study accordingly.

Students should use PROJECT ASSIST (http://www.assist.org) to research lower division major requirements at the transfer institution of their choice and should also work with the program adviser and a counselor to determine the appropriate transfer coursework.

Students interested in pursuing an Environmental Science major should consult with science faculty and counselors to tailor the specific coursework necessary to transfer to the 4-year institution of their choice.

Catalog Date: June 1, 2020

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<td>BIOL 350</td>
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<td>ECON 306</td>
<td>Environmental Economics</td>
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### Field/Applied Courses:

A minimum of 3 units from the following:

- BIOL 390 Natural History Field Study (0.5 - 4)
- GEOL 391 Field Studies in Geography: Mountain Landscapes (1 - 4)
- GEOL 392 Field Studies in Geography: Coastal Landscapes (1 - 4)
- GEOL 393 Field Studies in Geography: Arid Landscapes (1 - 4)
- GEOL 394 Field Studies in Geography: Volcanic Landscapes (1 - 4)
- GEOL 390 Field Studies in Geology (1 - 4)
- GEOL 331 Exploring Maps and Geographic Technologies (3)
- GEOL 335 Introduction to Geographic Information Systems Applications (3)

### Natural Science/Ecology Courses:

A minimum of 3 units from the following:

- BIOL 300 The Foundations of Biology (3)
- BIOL 307 Biology of Organisms (4)
- BIOL 310 General Biology (4)
- BIOL 400 Principles of Biology (5)

### Chemistry Courses:

A minimum of 4 units from the following:

- CHEM 305 Introduction to Chemistry (5)
- CHEM 321 Environmental Chemistry (3)
- CHEM 322 Environmental Chemistry Laboratory (!)
- CHEM 400 General Chemistry I (5)

### Earth Science Courses:

A minimum of 3 units from the following:

- GEOL 300 Physical Geography: Exploring Earth's Environmental Systems (3)
- GEOL 301 Physical Geography Laboratory (!)
- GEOL 305 Global Climate Change (3)
- GEOL 300 Physical Geology (3)
- GEOL 301 Physical Geology Laboratory (!)

### Quantitative Courses:

A minimum of 3 units from the following:

- ECON 310 Statistics for Business and Economics (3)
- PSYC 330 Introductory Statistics for the Behavioral Sciences (3)
- STAT 300 Introduction to Probability and Statistics (4)
- MATH 350 Calculus for the Life and Social Sciences I (3)
- MATH 400 Calculus I (5)

### Total Units:

31

The Environmental Studies & Sustainability Associate in Science (A.S.) degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See CRC graduation requirements.

### Student Learning Outcomes

Upon completion of this program, the student will be able to:

- **PSLO-1:** Articulate an understanding of the natural environment and human societies' relationship to it. This includes the ability to:
  - 1. Communicate effectively about environmental issues and sustainability, correctly utilizing vocabulary while indicating a complex understanding of disciplines in the program.
  - 2. Articulate an awareness of the relevance of environmental studies to the student's life and wider community at both local and global scales.
  - 3. Recognize the importance of interdisciplinary and multidisciplinary approaches to solving environmental problems.<p>→</p>

- **PSLO-2:** Evaluate and analyze environmental processes and human impacts on the natural environment. This includes the ability to:
  - 1. Use logical and quantitative reasoning to solve environmental problems.
  - 2. Analyze critical environmental problems facing the world today.
  - 3. Evaluate data and draw reasonable conclusions.
  - 4. Utilize the scientific method.
  - 5. Employ information-gathering tools to investigate environmental ideas.<p>→</p>

- **PSLO-3:** Recognize the ethical dimensions of decisions and actions and engage in the ethical reasoning necessary to be a responsible local and global citizen. This includes the ability to:
  - 1. Recognize the ethical implications of research and the responsibility to use knowledge wisely.
  - 2. Articulate the value of understanding environmental systems.<p>→</p>

- **PSLO-4:** Transfer to a 4-year program and further prepare for employment in an environmental career.<p>→</p>

### Career Information
## A.S. in General Science

Areas of Study include:

- Physical Anthropology
- Astronomy
- Biology
- Chemistry
- Engineering
- Physical Geography
- Geology
- Physics

Eighteen (18) units of transfer level course work in science is required. Two laboratory courses must be included: one in the physical sciences and one in the biological sciences. Courses may be selected from astronomy, biology, chemistry, geology, physical geography, physical anthropology, and physics. The student, in consultation with a counselor, should choose science courses to meet his or her program, transfer, or general education requirements.

Students interested in transferring to a four-year university with a science major are encouraged to complete a science AS or AS-T degree such as Anthropology, Biology, Chemistry, Engineering, Geography, Geology, or Physics. This General Science degree may not include the majors-level transfer courses needed for many science majors. Students are strongly recommended to see a counselor for guidance.

**Catalog Date:** June 1, 2020

### Degree Requirements

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<td>BIOL 307</td>
<td>Biology of Organisms (4)</td>
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<td>BIOL 431</td>
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<td><strong>B. Physical Science with Lab:</strong></td>
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### C. Additional Science Courses:

A minimum of 11 units from the following:

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<td>ASTR 300</td>
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<td>PHYS 310</td>
<td>Conceptual Physics (3)</td>
<td>3</td>
</tr>
<tr>
<td>PHYS 350</td>
<td>General Physics (4)</td>
<td>4</td>
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<tr>
<td>PHYS 360</td>
<td>General Physics (4)</td>
<td>4</td>
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<tr>
<td>PHYS 370</td>
<td>Introductory Physics - Mechanics and Thermodynamics (5)</td>
<td>5</td>
</tr>
<tr>
<td>PHYS 380</td>
<td>Introductory Physics - Electricity and Magnetism, Light and Modern Physics (5)</td>
<td>5</td>
</tr>
<tr>
<td>PHYS 411</td>
<td>Mechanics of Solids and Fluids (4)</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 421</td>
<td>Electricity and Magnetism (4)</td>
<td>4</td>
</tr>
<tr>
<td>PHYS 431</td>
<td>Heat, Waves, Light and Modern Physics (4)</td>
<td>4</td>
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</tbody>
</table>

**Total Units:** 18

Courses used in A or B above will not count towards C, except units exceeding the 4 or 3 unit minimum in A and B. For example, a student completing the 5 unit CHEM 309 under B could apply 2 of those units towards C. A total of 18 science units is required.

The General Science Associate in Science (A.S.) degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See CRC graduation requirements.

### Student Learning Outcomes

Upon completion of this program, the student will be able to:

- explain the core perspectives of the scientific method and apply it to at least one scientific discipline. (SLO 1)
- solve introductory problems of a conceptual and/or numerical nature of at least one scientific discipline. (SLO 2)
- accurately apply the basic vocabulary and concepts of at least one scientific discipline verbally and in writing. (SLO 3)
- recognize the use and misuse of scientific concepts in society including politics and the media. (SLO 4)
A.S. in Geography

Geography is the science of place and space. Geographers study the relationships among geographic places, natural systems, society, cultural activities, and the interdependence of all these over space. There are two main branches of geography: human geography and physical geography. Human geography is concerned with the spatial aspects of human existence – how people and their activities are distributed in space, how people use and perceive space, and how people create and sustain the places that make up Earth's surface. Physical geographers study the physical elements and spatial processes that make up and shape the environment, including energy, air, water, weather, climate, landforms, soils, animals, plants, etc. Many human and physical geographers have skills in cartography and Geographic Information Systems (GIS).

Geographers also study the linkages between human activity and natural systems. Geographers were, in fact, among the first scientists to sound the alarm that human-induced changes to the environment were beginning to threaten the balance of life itself. Geographers today are active in the study of global warming, desertification, deforestation, loss of biodiversity, groundwater pollution, flooding, and more.

The CRC Geography program offers courses that satisfy lower division General Education requirements in both the physical and social sciences. In addition, the program offers an Associate Degree in Geography that provides students with a solid foundation in geography as well as the standard prerequisites for upper-division coursework leading to the baccalaureate degree. Students may also earn a certificate in Geographic Information Systems (GIS). Students planning to transfer to a four-year school with a major in Geography should consult the lower division requirements at the university they plan to attend.

Note to Transfer Students:
If you are interested in transferring to a four-year college or university to pursue a bachelor's degree in this major, it is critical that you meet with a CRC counselor to select and plan the courses for your major. Schools vary widely in terms of the required preparation. The courses that CRC requires for an Associate's degree in this major may be different from the requirements needed for the Bachelor's degree.

Highlights include:
* Comprehensive course offerings including a Physical Laboratory as well as specialized training in Geographic Information Systems (GIS)
* Program's students have won top awards at state-level competitions annually since 1999
* Field study courses to Yosemite, Pt. Reyes, Monterey/Big Sur, Tahoe, and the Eastern Sierra
* Internships available with State of California, County of Sacramento, and Federal Land Management Agencies
* Three courses fulfill the CRC and CSU multicultural requirement
* Day, evening, and online sections

Catalog Date: June 1, 2020

Degree Requirements

<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>UNITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>GEOG 300</td>
<td>Physical Geography: Exploring Earth's Environmental Systems</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 301</td>
<td>Physical Geography Laboratory</td>
<td>1</td>
</tr>
<tr>
<td>GEOG 310</td>
<td>Human Geography: Exploring Earth's Cultural Landscapes</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 331</td>
<td>Exploring Maps and Geographic Technologies</td>
<td>3</td>
</tr>
<tr>
<td>PSYC 330</td>
<td>Introductory Statistics for the Behavioral Sciences</td>
<td>3 - 4</td>
</tr>
<tr>
<td>or STAT 300</td>
<td>Introduction to Probability and Statistics</td>
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<tr>
<td>or ECON 310</td>
<td>Statistics for Business and Economics</td>
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</table>

A minimum of 6 units from the following:

- ANTH 310  Cultural Anthropology (3)
- BIOL 350  Environmental Biology (3)
- or BIOL 310 General Biology (4)
- or BIOL 307 Biology of Organisms (4)
- ECON 304  Principles of Microeconomics (3)
- or ECON 302 Principles of Macroeconomics (3)
- GEOG 302  Environmental Studies & Sustainability (3)
- GEOG 305  Global Climate Change (3)
- GEOG 306  Weather and Climate (3)
- GEOG 320  World Regional Geography (3)
- GEOG 322  Geography of California (3)
- GEOG 325  Introduction to Geographic Information Systems Applications (3)
- GEOG 391  Field Studies in Geography: Mountain Landscapes (1 - 4)
- GEOG 392  Field Studies in Geography: Coastal Landscapes (1 - 4)
- GEOG 393  Field Studies in Geography: Arid Landscapes (1 - 4)
- GEOG 394  Field Studies in Geography: Volcanic Landscapes (1 - 4)
- GEOL 300  Physical Geology (3)
- GEOL 301  Physical Geology Laboratory (1)
- GEOL 330  Introduction to Oceanography (3)
- HIST 371  History of the Americas from the 19th Century Wars of Independence to the Present (3)
- or HIST 370  History of the Americas through the 19th Century Wars of Independence (3)
- or HIST 360  History of African Civilizations (3)
- or HIST 308  History of World Civilizations, 1500 to Present (3)
- or HIST 307  History of World Civilizations to 1500 (3)
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<tr>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>UNITS</th>
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<tbody>
<tr>
<td>HUM 332</td>
<td>American Humanities</td>
<td></td>
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<tr>
<td>or HUM 324</td>
<td>Global Islam: Culture and Civilization</td>
<td></td>
</tr>
<tr>
<td>or HUM 320</td>
<td>Asian Humanities</td>
<td></td>
</tr>
<tr>
<td>PHIL 352</td>
<td>Introduction to World Religions</td>
<td></td>
</tr>
<tr>
<td>POLS 310</td>
<td>Introduction to International Relations</td>
<td></td>
</tr>
<tr>
<td>SOC 300</td>
<td>Introductory Sociology</td>
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</table>

**Total Units:** 19 - 20

A minimum of 60 units is required for the A.S. degree which includes core courses, electives, and general education (GE) graduation requirements. Geography majors are encouraged to complete additional GE requirements from a list of suggested courses on file in the Geography Department and at the Counseling Center. Students should use PROJECT ASSIST (http://www.assist.org) to research lower division major requirements at the transfer institution of their choice and also work with a counselor to determine the most appropriate transfer coursework.

The Geography Associate in Science (A.S.) degree may be obtained by completion of the required program, plus general education requirements, plus sufficient electives to meet a 60-unit total. See CRC graduation requirements.

**Student Learning Outcomes**

Upon completion of this program, the student will be able to:

- SLO #1: Demonstrate understanding of the global natural and cultural environments and the geographic methods by which they are studied.
- SLO #2: Compare and contrast the general biophysical and socio-cultural differences and similarities among world regions that operate through time and over space.
- SLO #3: Evaluate and analyze critical geographic issues facing the world today.
- SLO #4: Recognize the diversity of peoples, places, and events globally as well as within specific geographic regions.
- SLO #5: Interpret maps and mapped data utilizing basic map elements, including scales, common coordinate systems, and map symbols.
- SLO #6: Use a computer effectively to research, map, and analyze geographic information.
- SLO #7: Compare and contrast common geographic technologies such as geographic information systems (GIS) and the global positioning system (GPS).
- SLO #8: Communicate geographic information effectively in oral, written, and graphic form.

**Career Information**

Natural Resource Management; Environmental Conservation; International Development; Urban and Regional Planning; Education (K-12 through University); Tourism; Cartographer; Climatologist; Park Ranger; Transportation Specialist; Real Estate Analyst; International Business; Marketing Analyst; Land Surveyor; Research Scientist; Remote Sensing Specialist; Demographer; GIS Analyst; and many more (please contact the program for additional information). Some career options may require more than two years of college study.

**Certificates of Achievement**

**Field Data Mapping and Geographic Information Systems (GIS) Certificate**

Students interested in research related to field data collection and analysis will need certain skills to correctly find locations in the field, identify locations, map sites, and integrate collected data into a Geographic Information System (GIS) for display and analysis. This interdisciplinary certificate program provides students with the tools needed to collect, map, display, and analyze data collected in a field-based setting and coordinate this with other mapping data and sources.

**Catalog Date:** June 1, 2020

**Certificate Requirements**

<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>UNITS</th>
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</thead>
<tbody>
<tr>
<td>GEOG 335</td>
<td>Introduction to Geographic Information Systems Applications</td>
<td>3</td>
</tr>
<tr>
<td>GEOG 331</td>
<td>Exploring Maps and Geographic Technologies</td>
<td>3</td>
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</table>

**A minimum of 6 units from the following:**

- GEOG 300 Physical Geography: Exploring Earth's Environmental Systems (3)
- GEOG 302 Environmental Studies & Sustainability (3)
- GEOG 310 Human Geography: Exploring Earth's Cultural Landscapes (3)
- ANTH 300 Biological Anthropology (3)
- ANTH 310 Cultural Anthropology (3)
- ANTH 323 Introduction to Archaeology (3)
- BIOL 350 Environmental Biology (3)
- BIOL 352 Conservation Biology (3)
- GEOG 300 Physical Geology (3)

**Total Units:** 12

**Student Learning Outcomes**

Upon completion of this program, the student will be able to:

- SLO #1: Demonstrate an understanding of the major modes of geographic inquiry.
- SLO #2: Demonstrate an understanding of mapping concepts, GIS, and the ability to interpret maps and mapped data.
- SLO #3: Demonstrate an understanding of common geographic technologies and the ability to use them to collect, analyze, and display geospatial data.
- SLO #4: Organize, manipulate, analyze and display tabular data into spatial visualizations.
- SLO #5: Exhibit skills learned through mapping and GIS project development.
Sustainability Certificate

This certificate advances student's understanding of the principles of sustainability and sustainable practices with respect to ecosystems, green buildings, business, agriculture, nutrition, natural resource management and conservation, waste management, energy, transportation systems, urban planning and design, and more. Theoretical and practical aspects of sustainability are explored including social, economic, and environmental dimensions.

Catalog Date: June 1, 2020

Certificate Requirements

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<thead>
<tr>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>UNITS</th>
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<tbody>
<tr>
<td>GEOG 302</td>
<td>Environmental Studies &amp; Sustainability</td>
<td>3</td>
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<tr>
<td>ARCH 342</td>
<td>Introduction to Green Buildings (3)</td>
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<tr>
<td>BIOL 350</td>
<td>Environmental Biology (3)</td>
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<td>BIOL 352</td>
<td>Conservation Biology (3)</td>
<td></td>
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<tr>
<td>ECON 306</td>
<td>Environmental Economics (3)</td>
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<tr>
<td>GEOG 300</td>
<td>Physical Geography: Exploring Earth’s Environmental Systems (3)</td>
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<tr>
<td>GEOG 305</td>
<td>Global Climate Change (3)</td>
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<tr>
<td>HORT 300</td>
<td>Introduction to Horticulture (3)</td>
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<tr>
<td>PLTS 310</td>
<td>Soils, Soil Management, and Plant Nutrition (3)</td>
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<tr>
<td>or HORT 302</td>
<td>Soils, Soil Management, and Plant Nutrition (3)</td>
<td></td>
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<tr>
<td>HORT 313</td>
<td>Sustainable Agriculture (3)</td>
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<tr>
<td>NUTRI 303</td>
<td>Plant-Based Nutrition (3)</td>
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<tr>
<td>NUTRI 331</td>
<td>Plant-Based Food Principles and Preparation (3)</td>
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A minimum of 9 units from the following:

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<tbody>
<tr>
<td>GEOG 301</td>
<td>Environmental Geography Lab (1)</td>
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<tr>
<td>PLTS 311</td>
<td>Soils, Soil Management, and Plant Nutrition (1)</td>
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<tr>
<td>or HORT 302</td>
<td>Soils, Soil Management, and Plant Nutrition (1)</td>
<td>1</td>
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<tr>
<td>NUTRI 303</td>
<td>Plant-Based Nutrition (1)</td>
<td>1</td>
</tr>
<tr>
<td>PLTS 331</td>
<td>Plant-Based Food Principles and Preparation (1)</td>
<td>1</td>
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</tbody>
</table>

Total Units: 12

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- PSLO#1: Communicate effectively about environmental issues and sustainability, utilizing correct vocabulary.
- PSLO#2: Articulate an awareness of the relevance of sustainability to the student’s life and wider community at both local and global scales.
- PSLO#3: Evaluate and analyze environmental problems facing the world today and propose sustainable solutions.
- PSLO#4: Employ information-gathering tools to investigate theoretical and practical aspects of sustainability in the context of energy consumption, transportation systems, food production, water resources, industry, the built environment, and socio-cultural institutions and practices.

Career Information

This certificate prepares students for entry-level sustainability consultant/technician positions in a variety of industries and settings, including private firms, nonprofit organizations, educational institutions, and government agencies at the local, state, and federal levels. Work opportunities for those pursuing additional coursework include positions in environmental economics, sustainable business practices, green building, natural resource management, food systems, energy, transportation, and urban planning.

Geography (GEOG) Courses

GEOG 300 Physical Geography: Exploring Earth's Environmental Systems

Units: 3
Hours: 54 hours LEC
Prerequisite: None.
Advisory: Concurrent enrollment in GEOG 301 (Physical Geography Lab) is suggested. GEOG 301 meets the UC and CSU transfer requirement for a 1-unit science lab.
Transferable: CSU; UC
General Education: AA/AS Area IV; CSU Area B1; IGETC Area 5A
C-ID: C-ID GEOG 110
Catalog Date: June 1, 2020

This course investigates the interrelationships between Earth and humans, with an emphasis on natural systems (solar energy balance, weather and climate, water resources, landforms, natural hazards, vegetation, and soil). Relevant application of these elements to today's world is stressed to help students better understand Earth's physical environment as well as human-environment interaction. A field trip may be required to relate class discussions to the real world.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- <b>SLO 1: DEMONSTRATE AN UNDERSTANDING OF THE MAJOR MODES OF GEOGRAPHIC INQUIRY AND TOOLS USED FOR GEOGRAPHIC ANALYSIS.</b>
  1. Describe how the scientific method and spatial analysis are used to research topics in physical geography.
  2. Demonstrate how to locate places on Earth using the geographic grid (latitude and longitude).
  3. Discuss several methods used to collect geographic data as well as several tools used to visualize and analyze this data.
  4. Demonstrate the ability to interpret maps and mapped data.

- <b>SLO 2: DEMONSTRATE AN UNDERSTANDING OF HOW EARTHY FOUR MAJOR OPEN SYSTEMS WORK AND INTERACT WITH ONE ANOTHER.</b>
  1. Explain latitudinal variation in energy receipt and how this relates to global patterns of temperature, precipitation, weather & climate, vegetation, wildlife habitat, etc.
  2. Diagram important physical processes (e.g., anticyclonic and cyclonic circulation, the global atmospheric circulation model, local & regional winds, the hydrologic cycle, the rock cycle, types of plate boundaries, etc.).
  3. Outline how processes in the atmosphere, hydrosphere, and lithosphere interact to create Earth's biosphere.

- <b>SLO 3: RECOGNIZE AND EXPLAIN THE LOCATION OF MAJOR PHYSICAL FEATURES ON EARTH.</b>
  1. Locate and identify the major significant physical features in California and elsewhere in the world.
  2. Apply knowledge of the hydrologic cycle, the rock cycle, Plate Tectonics, and other geomorphic processes to explain the location and formation of Earth's major landforms and natural hazards.
SLO 4: PRODUCE A RESEARCH PROJECT (E.G., ACADEMIC POSTER, TERM PAPER, OR SIMILAR PRODUCT) ON A COURSE-RELATED THEME.

1. Research information from multiple sources (maps, books, periodicals, Internet, interviews, etc.).
2. Synthesize findings in written format and document sources using an approved in-text citation method with references listed in standard bibliographic format.

SLO 5: RECOGNIZE THE IMPORTANCE OF, AND THINK CRITICALLY ABOUT, GEOGRAPHIC INFORMATION RELEVANT TO LIFE ON EARTH.

1. Analyze the role of humans in modifying Earth's physical environment as well as the environment's role in shaping human activities.
2. Evaluate the personal and societal implications of current geographic issues (e.g. climate change, ozone depletion, sea-level rise, pollution, natural hazards, etc.).

GEOG 301 Physical Geography Laboratory

Units: 3
Hours: 54 hours LEC
Prerequisite: None.
Corequisite: GEOG 300; GEOG 300 may be taken during a previous semester. Grade of "C" or better required if taken previously.
Transferable: CSU; UC
General Education: CSU Area B3; IGETC Area SC
C-ID: C-ID GEOG 111
Catalog Date: June 1, 2020

This course provides "hands-on" study of the basic principles and concepts involved in understanding Earth's environment systems. Labs feature observation, collection, analysis and display of data related to the study of Earth's energy balance, weather and climate, vegetation, tectonic processes, landforms, and natural hazards. Additionally, labs involve geographic methods and technology, including interpretation of maps and other geographic imagery, weather instrumentation, navigation equipment such as a compass and the Global Positioning System (GPS), and other relevant computer and Internet applications. A field trip may be required.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO#1: Collect, measure, and/or analyze geographic data using common instruments.
- Measure angular distance north/south of the Equator and east/west of the Prime Meridian in order to specify precise geographic coordinates on a map and/or globe.
- Collect and analyze data using common meteorological instruments (e.g. thermometer, anemometer, barometer, sling psychrometer, etc.), geomorphic instruments (e.g. stereoscopic imagery), and navigational instruments (e.g. compass, Global Positioning System (GPS) unit).
- Calculate unit conversions for various types of data (e.g. angular and linear distance, temperature, air pressure, etc.).
- SLO #2: Interpret and analyze geographic information using maps (thematic, regional, and topographic).
- Define the concepts of map scale and projection and explain how these concepts affect the way that geographic information is represented on maps and/or globes.
- Analyze global, regional, and/or local temperature, atmospheric pressure maps, and synoptic-scale weather maps and explain reasons for observed patterns.
- Interpret elevation data shown on a topographic map and use this information to construct a topographic profile for an area.
- Analyze and describe geomorphic processes and landforms using topographic maps.
- SLO#3: Explain geographic processes which act upon and shape Earth's physical environment.
- Explain how and why the amount of solar insolation received on Earth varies by latitude and relate how this affects life processes.
- Apply concepts related to atmospheric and geomorphic processes to predict impacts on Earth's physical and human environments.
- Identify types of landforms created by endogenic processes (e.g. volcanic and tectonic activity) and exogenic processes (e.g. weathering, erosion, and deposition).
- SLO#4: Compare and contrast local geographic data with other locations at regional, national, and global scales.
- Construct climographs for Sacramento, various other locations in CA, the U.S. and the world and identify factors responsible for observed climatic differences.
- Analyze meteorologic and geomorphic patterns in Sacramento, CA, the U.S., and the world and explain why these phenomena are observed where they are found.

GEOG 302 Environmental Studies & Sustainability

Units: 3
Hours: 54 hours LEC
Prerequisite: None.
Corequisite: GEOG 300; GEOG 300 may be taken during a previous semester.
Transferable: CSU; UC
General Education: AA/AS Area V(b); CSU Area D5; CSU Area D7; IGETC Area 4E; IGETC Area 4G
Catalog Date: June 1, 2020

This introductory course offers an interdisciplinary perspective on the major environmental problems confronting society and explores solutions directed toward producing a more sustainable future. Course topics include an introduction to environmental issues, and related values, ethics and politics; a primer on Earth system science — the interconnected nature of the atmosphere, hydrosphere, lithosphere, and biosphere; a global survey of natural resources and exploitation; changing global climates; the world water crisis; the demography of human population, and contrasts between less-and more-developed countries; agricultural and food supply challenges; renewable and nonrenewable energy resources; and land use patterns and related issues. Throughout the course, human impacts on the environment, environmental impacts on human societies, and the sustainability of economies and practices at local, regional, and global scales are investigated. A field trip may be required to relate class discussions to the real world.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO-1: Articulate an understanding of the natural environment and human societies' relationship to it. This includes the ability to:

  1. Communicate effectively about environmental issues and sustainability, correctly utilizing vocabulary while demonstrating understanding of topics studied.
  2. Explain the relevance of environmental issues to the student's life and wider community at local, regional, and global scales.

- SLO-2: Evaluate and analyze human impacts on the natural environment. This includes the ability to:

  1. Analyze critical environmental problems facing the world today, recognizing the interconnections between humans, their activities, and resulting effects on the environment.
  2. Evaluate data and draw reasonable conclusions.
  3. Employ information-gathering tools to investigate environmental issues.
  4. Investigate and formulate sustainable solutions to environmental problems.

- SLO-3: Recognize the ethical dimensions of decisions and actions and engage in the ethical reasoning necessary to be a responsible local and global citizen. This includes the ability to:

  1. Recognize the ethical implications of environmental problems.

- SLO-4: PRODUCE A RESEARCH PROJECT (E.G., ACADEMIC POSTER, TERM PAPER, OR SIMILAR PRODUCT) ON A COURSE-RELATED THEME.

1. Research information from multiple sources (maps, books, periodicals, Internet, interviews, etc.).
2. Synthesize findings in written format and document sources using an approved in-text citation method with references listed in standard bibliographic format.

- SLO-5: RECOGNIZE THE IMPORTANCE OF, AND THINK CRITICALLY ABOUT, GEOGRAPHIC INFORMATION RELEVANT TO LIFE ON EARTH.

1. Analyze the role of humans in modifying Earth's physical environment as well as the environment's role in shaping human activities.
2. Evaluate the personal and societal implications of current geographic issues (e.g. climate change, ozone depletion, sea-level rise, pollution, natural hazards, etc.).
GEOG 305 Global Climate Change

Upon completion of this course, the student will be able to:

1. Define the greenhouse effect, anthropogenic global warming, and climate change.
2. Provide examples of natural and anthropogenic causes of climate change.
3. Discuss current evidence for anthropogenic global warming, list examples of its impacts, and provide suggestions for mitigation and adaptation.

GEOG 306 Weather and Climate

Upon completion of this course, the student will be able to:

1. Demonstrate the ability to graph and/or map atmospheric data and explain its significance.
2. Detail the processes of energy exchange within the Earth-atmosphere system.
3. Describe atmospheric humidity processes, specifically those involving phase changes of water.
4. Explain why and where precipitation occurs, including sources of moisture, lifting mechanisms, adiabatic processes, and cloud/precipitation formation.
5. Compare and contrast the dynamics of severe weather systems, including thunderstorms, hurricanes, and tornados.
6. Classify and interpret atmospheric data in order to describe climatic variation over Earth's surface.
7. Discuss the mechanisms of climate change (both natural and anthropogenic), its impacts and potential solutions.

GEOG 310 Human Geography: Exploring Earth's Cultural Landscapes
This course investigates the diverse patterns of human settlement, development, and movement on earth, which evolved as a result of cultural and environmental factors. Emphasis is placed on understanding global population and migration patterns, language, religion, ethnicity, political and economic systems, development issues, agriculture and urbanization.

### Student Learning Outcomes

Upon completion of this course, the student will be able to:

- **SLO #1:** Analyze human's role in transforming Earth's surface into a series of distinctive cultural landscapes. (1) Explain the significance of major stages of human cultural evolution over time (i.e., agricultural, industrial, medical, and technological revolutions).<br/>
- **SLO #2:** Propose explanations for the geographic origin and global diffusion of key aspects of culture (e.g., technology, language, religion, ethnocentrism, racism, agriculture, urbanization). (2) Differentiate between relocation and expansion diffusion as mechanisms for spreading cultural traits.<br/>
- **SLO #3:** Describe broad historical and modern global socioeconomic processes such as migration, colonization, and globalization. (1) Explain how these processes relate to spatial patterns today, such as ethnicity, unequal development, poverty, conflict, and environmental degradation.<br/>
- **SLO #4:** Recognize and appreciate patterns of cultural diversity in California, the U.S., and the world. (2) Identify major socioeconomic, political, and/or environmental issues currently affecting Earth's major geographic regions.<br/>
- **SLO #5:** Demonstrate understanding of key geographic concepts such as diffusion and globalization by analyzing and explaining spatial patterns represented on maps. (1) Interpret maps of various types of socioeconomic data (e.g., demographic, linguistic, religious, ethnic, AIDS incidence, GNP per capita, etc.) and explain their significance.<br/>
- **SLO #6:** Communicate geographic information effectively in oral, written, and/or graphic form. (1) Produce a significant research project (e.g., academic poster, term paper, or similar product) on a course-related theme.<br/>
Objective 3.1: describe both perspectives on several ethical issues facing California and propose some solutions.

SLO #5: communicate geographic information effectively in oral, written, and graphic form.

Objective 5.1: develop one or several projects illustrating an understanding of California geography.

GEOG 331 Exploring Maps and Geographic Technologies

| Units: | 3 |
| Hours: | 48 hours LEC, 18 hours LAB |
| Prerequisite: | None |
| Transferable: | CSU; UC |
| General Education: | AA/AS Area IV |
| C-ID: | C-ID GEOG 150 |
| Catalog Date: | June 1, 2020 |

Maps are the most effective way to communicate spatial information. This course introduces students to the quickly changing world of maps (both hardcopy and digital) and geographic techniques and technologies such as map and aerial photograph interpretation, spreadsheet operations, basic statistics, cartography, Global Positioning Systems (GPS), Internet mapping, remote sensing and Geographic Information Systems (GIS) that aid in data collection, analysis and presentation.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- **SLO #1:** DEMONSTRATE AN UNDERSTANDING OF THE MAJOR MODES OF GEOGRAPHIC INQUIRY.
- **SLO #2:** DEMONSTRATE AN UNDERSTANDING OF MAPPING CONCEPTS AND THE ABILITY TO INTERPRET MAPS AND MAPPED DATA.
- **SLO #3:** DEMONSTRATE AN UNDERSTANDING OF COMMON GEOGRAPHIC TECHNOLOGIES AND THE ABILITY TO USE THEM TO COLLECT, ANALYZE, AND DISPLAY GEOSPATIAL DATA.
- **SLO #4:** ORGANIZE, MANIPULATE, ANALYZE AND DISPLAY TABULAR DATA INTO SPATIAL VISUALIZATIONS.
- **SLO #5:** communicate geographic information effectively in oral, written, and graphic form.

GEOG 335 Introduction to Geographic Information Systems Applications

| Units: | 3 |
| Hours: | 45 hours LEC, 27 hours LAB |
| Prerequisite: | None |
| Advisory: | CISC 302 |
| Transferable: | CSU |
| C-ID: | C-ID GEOG 155 |
| Catalog Date: | June 1, 2020 |

Geographic Information Systems (GIS) are computer-based mapping programs that analyze spatial data. This course provides the foundation for using desktop GIS software. A conceptual overview along with hands-on experience will be used to explore basic GIS software functionality. Emphasis will be placed on display characteristics, attribute querying, database exploration and management, spatial analysis, data creation, and cartographic presentation.

This course is not open to students who have received credit for GEOG 335.1, 335.2, and 335.3.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- **SLO #1:** demonstrate an understanding of GIS technologies, theories and practices
- **SLO #2:** apply GIS technical skills in a professional setting
- **SLO #3:** exhibit skills learned via GIS project development
- **SLO #4:** recognize, appreciate, and understand the geographic diversity of people, places, and events specific to California.
- **SLO #5:** communicate geographic information effectively in oral, written, and graphic form.
SLO #4: cultivate spatial analysis and critical thinking skills for decision-making purposes.

SLO #5: understand how GIS skills are applicable in specific career fields.

**GEOG 353 Introduction to the Global Positioning System (GPS)**

<table>
<thead>
<tr>
<th align="right">Units:</th>
<th>1</th>
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</thead>
<tbody>
<tr>
<td align="right">Hours:</td>
<td>16 hours LEC; 6 hours LAB</td>
</tr>
<tr>
<td align="right">Prerequisite:</td>
<td>None.</td>
</tr>
<tr>
<td align="right">Transferable:</td>
<td>CSU</td>
</tr>
<tr>
<td align="right">Catalog Date:</td>
<td>June 1, 2020</td>
</tr>
</tbody>
</table>

This course introduces the Global Positioning System (GPS). Topics include basic concepts of GPS including hands-on operation of the technology, real-world applications, computer interfaces, GIS and other mapping software. A field trip may be required.

**Student Learning Outcomes**

Upon completion of this course, the student will be able to:

- **SLO 1: Demonstrate competent use of GPS technology and function**
- Evaluate GPS receiver operation for positioning and navigation
- Design and implement field data collection for mapping
- **SLO 2: Integrate GPS data into computer mapping applications**
- Describe GPS in relation to basic geographic information system (GIS) concepts
- Describe the procedure for downloading and uploading GPS data to and from a computer
- Create maps of GPS data using computer software

**GEOG 390 Field Studies in Geography**

<table>
<thead>
<tr>
<th align="right">Units:</th>
<th>1 - 4</th>
</tr>
</thead>
<tbody>
<tr>
<td align="right">Hours:</td>
<td>6 - 24 hours LEC; 36 - 144 hours LAB</td>
</tr>
<tr>
<td align="right">Prerequisite:</td>
<td>None.</td>
</tr>
<tr>
<td align="right">Transferable:</td>
<td>CSU</td>
</tr>
<tr>
<td align="right">C-ID:</td>
<td>C-ID GEOG 160</td>
</tr>
<tr>
<td align="right">Catalog Date:</td>
<td>June 1, 2020</td>
</tr>
</tbody>
</table>

This course involves the study of geographic principles and processes in the field. Course content will vary by destination but may include topics in physical geography (e.g., plant and animal communities, climate and weather, ecology and geomorphology, natural hazards, environmental impacts, etc.), human geography (e.g., cultural landscapes, economic activities, transportation issues, land use patterns, etc.), and/or introduction to tools and techniques used for geographic field research (e.g., map and compass use, the Global Positioning System (GPS), Geographic Information Systems (GIS), etc.). Field trip(s) are required.

**Student Learning Outcomes**

Upon completion of this course, the student will be able to:

- **SLO 1: APPLY BASIC PRINCIPLES OF GEOGRAPHY TO OBSERVATIONS IN THE FIELD**
- Develop observational skills in the field.
- Explain any evidence of human-environmental interactions observed in the field and discuss its implications.
- Understand the roles of biotic and abiotic elements within specific ecosystems.
- **SLO 2: UTILIZE INVESTIGATIONS, OBSERVATIONS AND READINGS TO DEVELOP A GREATER DEPTH OF UNDERSTANDING OF GEOGRAPHIC PRINCIPLES.**
- Compare knowledge gained from readings and lectures to field observations.
- Utilize appropriate information sources to increase knowledge of one aspect of the course topic.
- **SLO 3: COMMUNICATE KNOWLEDGE GAINED IN THIS COURSE EFFECTIVELY IN ORAL, WRITTEN, AND/OR GRAPHIC FORM**

**GEOG 391 Field Studies in Geography: Mountain Landscapes**

<table>
<thead>
<tr>
<th align="right">Units:</th>
<th>1 - 4</th>
</tr>
</thead>
<tbody>
<tr>
<td align="right">Hours:</td>
<td>6 - 24 hours LEC; 36 - 144 hours LAB</td>
</tr>
<tr>
<td align="right">Prerequisite:</td>
<td>None.</td>
</tr>
<tr>
<td align="right">Transferable:</td>
<td>CSU</td>
</tr>
<tr>
<td align="right">Catalog Date:</td>
<td>June 1, 2020</td>
</tr>
</tbody>
</table>

This course involves the study of geographic principles and processes in mountain environments. The course content will vary by destination but may include topics in physical geography (e.g., plant and animal communities, climate and weather, ecology and geomorphology, natural hazards, environmental impacts, etc.), human geography (e.g., cultural landscapes, economic activities, transportation issues, land use patterns, etc.), and introduction to tools and techniques used for geographic field research (e.g., map and compass use, the Global Positioning System (GPS), Geographic Information Systems (GIS), etc.). Field excursions are required.

**Student Learning Outcomes**

Upon completion of this course, the student will be able to:

- **SLO 1: demonstrate skill of gaining and applying learned material in a field experience.**
- apply concepts and processes discussed in lecture to experiences in the field.
- compose field notes and collect and analyze field data.
- **SLO 2: explain physical and/or cultural phenomena of a specific region.**
- describe and explain physical and/or cultural phenomena of a specific region.
- integrate geographic information from various disciplines (geology, biology, ecology, urban studies, anthropology, history, economics, cultural studies, and others) in order to explain landscape patterns and processes.
GEOG 392 Field Studies in Geography: Coastal Landscapes

This is a field studies course of the geography of coastal landscapes. Physical and cultural processes, characteristics and landscapes will be observed and analyzed. Specific content will vary by geographic region. A field trip is required.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: demonstrate skills of gaining and applying learned material in a field experience.
- apply concepts and processes discussed in lecture to experiences in the field.
- compose field notes and collect and analyze field data.
- SLO 2: explain physical and/or cultural phenomena of a specific region.
- describe and explain geographic phenomena related to the particular physical and/or human environments under study.
- integrate geographic information from various disciplines (geology, biology, ecology, urban studies, anthropology, history, economics, cultural studies, and others) in order to explain landscape patterns and processes.

GEOG 393 Field Studies in Geography: Arid Landscapes

This course involves the study of geographic principles and processes in arid environments. The course content will vary by destination but may include topics in physical geography (e.g., plant and animal communities, climate and weather, geology and geomorphology, natural hazards, environmental impacts, etc.), human geography (e.g., cultural landscapes, economic activities, transportation issues, land use patterns, etc.), and introduction to tools and techniques used for geographic field research (e.g., map and compass use, the Global Positioning System (GPS), Geographic Information Systems (GIS), etc.). Field excursions are required.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: demonstrate skill of gaining and applying learned material in a field experience.
- apply concepts and processes discussed in lecture to experiences in the field.
- compose field notes and collect and analyze field data.
- SLO 2: explain physical and/or cultural phenomena of a specific region.
- describe and explain physical and/or cultural phenomena of a specific region.
- integrate geographic information from various disciplines (geology, biology, ecology, urban studies, anthropology, history, economics, cultural studies, and others) in order to explain landscape patterns and processes.

GEOG 394 Field Studies in Geography: Volcanic Landscapes

This course involves the study of geographic principles and processes in volcanic environments. The course content will vary by destination but may include topics in physical geography (e.g., plant and animal communities, climate and weather, geology and geomorphology, natural hazards, environmental impacts, etc.), human geography (e.g., cultural landscapes, economic activities, transportation issues, land use patterns, etc.), and introduction to tools and techniques used for geographic field research (e.g., map and compass use, the Global Positioning System (GPS), Geographic Information Systems (GIS), etc.). Field excursions are required.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: demonstrate skills of gaining and applying learned material in a field experience.
- apply concepts and processes discussed in lecture to experiences in the field.
- compose field notes and collect and analyze field data.
- SLO 2: explain physical and/or cultural phenomena of a specific region.
- describe and explain geographic phenomena related to the particular physical and/or human environments under study.
- integrate geographic information from various disciplines (geology, biology, ecology, urban studies, anthropology, history, economics, cultural studies, and others) in order to explain landscape patterns and processes.

GEOG 495 Independent Studies in Geography

Units: 1 - 4
Hours: 6 - 24 hours LEC; 36 - 144 hours LAB
Prerequisite: None.
Transferable: CSU
Catalog Date: June 1, 2020

This is a field studies course of the geography of coastal landscapes. Physical and cultural processes, characteristics and landscapes will be observed and analyzed. Specific content will vary by geographic region. A field trip is required.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: demonstrate skills of gaining and applying learned material in a field experience.
- apply concepts and processes discussed in lecture to experiences in the field.
- compose field notes and collect and analyze field data.
- SLO 2: explain physical and/or cultural phenomena of a specific region.
- describe and explain geographic phenomena related to the particular physical and/or human environments under study.
- integrate geographic information from various disciplines (geology, biology, ecology, urban studies, anthropology, history, economics, cultural studies, and others) in order to explain landscape patterns and processes.

GEOG 499 Independent Studies in Geography

Units: 1 - 4
Hours: 6 - 24 hours LEC; 36 - 144 hours LAB
Prerequisite: None.
Transferable: CSU
Catalog Date: June 1, 2020

This course involves the study of geographic principles and processes in arid environments. The course content will vary by destination but may include topics in physical geography (e.g., plant and animal communities, climate and weather, geology and geomorphology, natural hazards, environmental impacts, etc.), human geography (e.g., cultural landscapes, economic activities, transportation issues, land use patterns, etc.), and introduction to tools and techniques used for geographic field research (e.g., map and compass use, the Global Positioning System (GPS), Geographic Information Systems (GIS), etc.). Field excursions are required.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: demonstrate skill of gaining and applying learned material in a field experience.
- apply concepts and processes discussed in lecture to experiences in the field.
- compose field notes and collect and analyze field data.
- SLO 2: explain physical and/or cultural phenomena of a specific region.
- describe and explain physical and/or cultural phenomena of a specific region.
- integrate geographic information from various disciplines (geology, biology, ecology, urban studies, anthropology, history, economics, cultural studies, and others) in order to explain landscape patterns and processes.

GEOG 599 Independent Studies in Geography

Units: 1 - 4
Hours: 6 - 24 hours LEC; 36 - 144 hours LAB
Prerequisite: None.
Transferable: CSU
Catalog Date: June 1, 2020

This course involves the study of geographic principles and processes in volcanic environments. The course content will vary by destination but may include topics in physical geography (e.g., plant and animal communities, climate and weather, geology and geomorphology, natural hazards, environmental impacts, etc.), human geography (e.g., cultural landscapes, economic activities, transportation issues, land use patterns, etc.), and introduction to tools and techniques used for geographic field research (e.g., map and compass use, the Global Positioning System (GPS), Geographic Information Systems (GIS), etc.). Field excursions are required.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: demonstrate skills of gaining and applying learned material in a field experience.
- apply concepts and processes discussed in lecture to experiences in the field.
- compose field notes and collect and analyze field data.
- SLO 2: explain physical and/or cultural phenomena of a specific region.
- describe and explain geographic phenomena related to the particular physical and/or human environments under study.
- integrate geographic information from various disciplines (geology, biology, ecology, urban studies, anthropology, history, economics, cultural studies, and others) in order to explain landscape patterns and processes.
An independent studies project involves an individual student or small group of students in study, research, or activities beyond the scope of regularly offered courses. See the current catalog section of "Special Studies" for full details of Independent Studies.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- **SLO #1**: Actively engage in intellectual inquiry beyond that required in order to pass a course of study.
  - Discuss and outline a proposal of study with a supervising instructor in Geography or Geographic Information Systems (GIS) or Environmental Studies.
  - Design an independent study (to be completed individually or by collaboration of a small group) to foster special knowledge, skills, and experience that are not available in any one regularly scheduled course.
  - Gather data or information needed for analysis in Geography or Geographic Information Systems (GIS) or Environmental Studies.
- **SLO #2**: Utilize modes of analysis and critical thinking to apply theoretical perspectives and/or concepts in Geography or Geographic Information Systems (GIS) or Environmental Studies to significant problems and/or educational activities.
  - Analyze and apply the knowledge, skills and experience that are involved in the independent study to theoretical perspectives and/or concepts in Geography or Geographic Information Systems (GIS) or Environmental Studies.
- **SLO #3**: Communicate a complex understanding of content matter of Geography or Geographic Information Systems (GIS) or Environmental Studies.
  - Demonstrate competence in the skills necessary to accomplish the independent study.
  - Present the results of your research or inquiry.

GEOG 499 Experimental Offering in Geography

<table>
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<th>Units:</th>
<th>0.5 - 4</th>
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<tbody>
<tr>
<td>Hours:</td>
<td>None.</td>
</tr>
<tr>
<td>Prerequisite:</td>
<td>CSU; UC (Credit for variable topics courses is given only after a review of the scope and content of the course by the enrolling UC campus.)</td>
</tr>
<tr>
<td>Transferable:</td>
<td>CSU</td>
</tr>
<tr>
<td>Catalog Date:</td>
<td>June 1, 2020</td>
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</tbody>
</table>

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