EARTH AND PLANETARY SCIENCES

Earth and Planetary Sciences is the department for explorers! You can study Earth and beyond through programs in Astronomy, Geology, Geography, and Environmental Studies. Each of these programs contains one or more majors and supports the student body by providing popular and transferable introductory level physical and social science courses.

Earth Scientists study mountain building, rivers and groundwater, oceans and the atmosphere and the connections between them, and the history of earth and the life it supports. Geographers study how Earth processes and resources vary spatially over the globe and influence society. Students of Environmental Studies explore how Earth processes affect human populations and how people are changing our planet. Astronomers explore how Earth's trajectory through our solar system affects life on Earth, the possibility of life elsewhere, and the origins of our universe.

Courses include Astronomy, Geology, Physical and Human Geography, GIS, Weather and Climate, and even Black holes. Earth and planetary scientists pursue lucrative and rewarding careers protecting society from debris flows and earthquakes, finding and responsibly utilizing Earth's mineral and energy resources, modeling climate change and understanding its impact on people, and improving social justice. See the EPS department website (http://www.sbcc.edu/earthscience/) for more information.

The Astronomy Major

Astronomy has played an important role in the development of modern science and technology. Astronomers study the formation, chemistry, composition, and evolution of celestial objects. Modern astronomers work with advanced technology and instrumentation to study planets, stars galaxies, nebulae, black holes, and the universe itself. Students take astronomy courses to prepare for a major in astronomy, or to fulfill general education requirements in related fields, or to prepare for various vocational jobs as technicians for high-tech industries. Graduates with a bachelor's degree in astronomy pursue careers as museum and planetarium directors, astronomers/astrophysicists, space scientists, mission data analysts, spacecraft and instrument designers, teachers, observatory technicians, telescope operators, electronics technicians, computer programmers, or to work in the fields of optics, mathematics, electronics, or computer programming.

For more information on the Astronomy program visit http://www.sbcc.edu/earthscience/astronomy.php

The Geography Major

Geography is the science of space and place. Geographers study spatial distributions and relations within Earth's human-environment systems, incorporating historic and contemporary human activities within the context of the biophysical and cultural environments, and the emergence of humanity as one of the major agents of change on Earth. The geography program exposes students to many of the tools and technologies employed by earth science professionals, including Geographic Information Systems (GIS) and Global Positioning Systems (GPS). The Associate in Arts Degree in Geography provides for a liberal education and prepares one for positions in business, government, environmental consulting, resource management, teaching, the technology sector, and service in foreign areas.

For more information on the Geography program visit http://www.sbcc.edu/geography/

The Geology Major

Geology is a multi-disciplinary science that applies biology, chemistry, physics, mathematics and engineering to the natural world around us. The rich variety of its fields of study includes oceanography, paleontology, geophysics, geochemistry, hydrogeology, engineering geology, environmental geology and more. That is what makes geology an exciting and challenging major for students with broad scientific interests and a love for natural systems, environments and our planet's history.

Geology majors gain scientific observational reasoning, communication skills and an understanding of geological concepts and history. This blend of interpretive scientific ability and historical perspective gives geologists an important role in society. They apply their skills and knowledge to solve complex problems related to human interaction with natural systems, hazards and resources, and to communicate solutions and options to the public.

Geology majors may choose between two AS degrees, one designed for students seeking the minimum requirements for transfer to a CSU (Geology AS for transfer (https://catalog.sbcc.edu/academic-departments/earth-planetary-sciences/geology-ast/)), and the other to provide a deeper dive into the geosciences that gives students robust preparation for transfer anywhere (AS in Geological (https://catalog.sbcc.edu/academic-departments/earth-planetary-sciences/geological-sciences-as/)Sciences).

Planning a Program of Study

Careers in the earth and planetary sciences are increasingly dependent upon completion of one year of calculus, college chemistry and college physics, along with a sound foundation in the earth sciences. The student is therefore urged to plan a program to ensure the orderly completion of the required courses outside the earth sciences. Students having deficiencies, particularly in mathematics, should correct these deficiencies early in their programs.

Not all courses in the Department of Earth and Planetary Sciences are offered each semester. Courses currently offered only during the Fall Semester are ERTH 125 (https://catalog.sbcc.edu/search/?P=ERTH%20125) Mineralogy and Resources, ERTH 114 (https://catalog.sbcc.edu/search/?P=ERTH%20114) The Geology Of California, and ERTH 131 (https://catalog.sbcc.edu/search/?P=ERTH%20131) Geologic Field Studies - Eastern Sierra Nevada.

Courses currently offered only during the Spring Semester are ERTH 126 (https://catalog.sbcc.edu/search/?P=ERTH%20126) Petrology and Rock-Forming Minerals, ERTH 113 (https://catalog.sbcc.edu/search/?P=ERTH%20113) Geology of National Parks, and ERTH 132 (https://catalog.sbcc.edu/search/?P=ERTH%20132) Geologic Field Studies - Death Valley.

Our longer field courses are offered only in the summers and some are staggered in alternating summers: ERTH 133 (https://catalog.sbcc.edu/search/?P=ERTH%20133) Introductory Geologic Field Seminar - Colorado Plateau, offered every summer; ERTH 137 (https://catalog.sbcc.edu/search/?search=erth+137&context=catalog) and 138 (https://catalog.sbcc.edu/search/?

search=erth+138&context=catalog) Introductory Field Geology and Geology Field Camp, offered only in odd-year summers; and ERTH 134 (https://catalog.sbcc.edu/search/?search=erth+134&context=catalog) Geologic Field Studies - Western Sierra Nevada, offered only late in even-year summers.

Programs of Study

Associate Degrees for Transfer

- Geography, Associate in Arts for Transfer (AA-T) (https://catalog.sbcc.edu/academic-departments/geography/geography-aat/#requirementstext)
- Geology, Associate in Science for Transfer (AS-T) (https://catalog.sbcc.edu/academic-departments/earth-planetary-sciences/geology-ast/)

Associate Degrees

- Astronomy, Associate of Science (AS) (https://catalog.sbcc.edu/academic-departments/earth-planetary-sciences/astronomy-as/)
- Environmental Studies, Associate of Arts (AA) (https://catalog.sbcc.edu/academic-departments/environmental-studies/environmental-studies-aa/)
- Geography, Associate of Arts (AA) (https://catalog.sbcc.edu/academic-departments/geography/geography-aa/)
- Geological Sciences, Associate of Science (AS) (https://catalog.sbcc.edu/academic-departments/earth-planetary-sciences/geological-sciences-as/)

Credit Courses

Earth Studies and Planetary Sciences (ERTH)

ERTH 101 Introductory Astronomy (3 Units)
Hours: 54 (54 lecture)
Non-mathematical presentation of knowledge of the universe. Includes birth and death of stars, formation of the solar system, black holes, quasars, the fourth dimension, and the fate of the universe. Also considered are common phenomena such as eclipses, the motion of the planets and their moons, comets, and meteors.
SBCC General Education: SBCCGE Area A Lecture
Transfer Information: CSUGE Area B1, IGETC Area 5A, CSU Transferable, UC Transferable
UC Transfer Limit: ERTH 101 and ERTH 101H combined: Maximum credit, one course.

ERTH 101H Introductory Astronomy, Honors (4 Units)
Limitations on Enrollment: Admission to Program.
Course Advisories: ERTH 102.
Hours: 72 (72 lecture)
Introduces students to the universe throughout its history. It emphasizes astronomical knowledge from Earth, as a planet in the solar system, to quasars at the edge of the known universe. The motions of objects within the galaxy are also examined.
SBCC General Education: SBCCGE Area A Lecture
Transfer Information: CSUGE Area B1, IGETC Area 5A, CSU Transferable, UC Transferable
UC Transfer Limit: ERTH 101 and ERTH 101H combined: Maximum credit, one course.

ERTH 102 Observational Astronomy Laboratory (1 Unit)
Corequisites: ERTH 101 or 101H.
Hours: 54 (54 lab)
Emphasizes night-time observation of the stars, galaxies and constellations with real-time observations. Simulation programs are used to graphically examine astronomical phenomena. Celestial navigation, motions of the earth and moon, and study of the celestial sphere emphasized.
SBCC General Education: SBCCGE Area A Lab
Transfer Information: CSUGE Area B3, IGETC Area 5C, CSU Transferable, UC Transferable

ERTH 103A Adv Observational Astronomy Lab - FALL (1 Unit)
Prerequisites: ERTH 102.
Hours: 54 (54 lab)
Follow-up course to ERTH-102. Use of planetarium and observatory to illustrate constellations, celestial motions, and to observe stars, planets, and deep sky objects. Emphasis for continuing students is on stars & constellations of the FALL sky, use of larger and more advanced telescopes, and in-depth observations of deep sky objects of the FALL sky.
Transfer Information: CSU Transferable, UC Transferable
UC Transfer Limit: ERTH 103A, 103B, 103C combined: Maximum credit, one course.

ERTH 103B Adv Observational Astronomy Lab - SPRING (1 Unit)
Prerequisites: ERTH 102.
Hours: 54 (54 lab)
Follow-up course to ERTH-102. Use of planetarium and observatory to illustrate constellations, celestial motions, and to observe stars, planets, and deep sky objects. Emphasis for continuing students is on stars & constellations of the SPRING sky, use of larger and more advanced telescopes, and in-depth observations of deep sky objects of the SPRING sky.
Transfer Information: CSU Transferable, UC Transferable
UC Transfer Limit: ERTH 103A, 103B, 103C combined: Maximum credit, one course.

ERTH 103C Adv Observational Astronomy Lab - SUMMER (1 Unit)
Prerequisites: ERTH 102.
Hours: 54 (54 lab)
Follow-up course to ERTH-102. Use of planetarium and observatory to illustrate constellations, celestial motions, and to observe stars, planets, and deep sky objects. Emphasis for continuing students is on stars & constellations of the SUMMER sky, use of larger and more advanced telescopes, and in-depth observations of deep sky objects of the SUMMER sky.
Transfer Information: CSU Transferable, UC Transferable
UC Transfer Limit: ERTH 103A, 103B, 103C combined: Maximum credit, one course.

ERTH 104 Introductory Astrophysics (3 Units)
Hours: 54 (54 lecture)
Introductory astronomy course that integrates mathematics of physics in the study of objects in the universe.
Transfer Information: CSUGE Area B1, IGETC Area 5A, CSU Transferable, UC Transferable

ERTH 105A Planetary Geology of Recent NASA Missions (1 Unit)
Hours: 18 (18 lecture)
Designed for students wanting to go beyond the regular introductory astronomy courses. Lectures, discussions, guest speakers, activities and field trips help students explore specific topics in physics and astronomy. This semester's topic is on recent discoveries from planetary space flight missions to Mercury, Mars, Saturn, Saturn's moon titan and comets.
Transfer Information: CSU Transferable

ERTH 106 Black Holes and the Universe (3 Units)
Course Advisories: ERTH 101 or 101H.
Hours: 54 (54 lecture)
Basic introduction to relativity, cosmology, quantum mechanics, string theory, black holes, time travel, higher dimensions and other abstract theories of the universe. Provides students with a broad-based overview of these physics theories and allows them to explore various current topics in astronomy.
Transfer Information: CSUGE Area B1, IGETC Area 5A, CSU Transferable, UC Transferable

ERTH 111 Dynamic Earth - Physical Geology (3 Units)
Course Advisories: ERTH 111L and 131 or 132.
Hours: 54 (54 lecture)
Introduction to the physical development of the Earth. Emphasis on earth materials (rocks and minerals), hydrologic processes, tectonic process (plate tectonics, earthquakes, mountain building and volcanism) and structures (folds, faults). Current theories on structure and evolution of the earth are discussed. Designed for both non-science majors and earth science majors. Required of all Geology majors.
SBCC General Education: SBCCGE Area A Lecture
Transfer Information: CSUGE Area B1, IGETC Area 5A, CSU Transferable, UC Transferable
UC Transfer Limit: ERTH 111 and 111H combined: maximum credit, one course.
C-ID: GEOL 100.

ERTH 111H Dynamic Earth - Physical Geology, Honors (4 Units)
Limitations on Enrollment: Acceptance into the Honors Program.
Course Advisories: ERTH 111L or ERTH 131.
Hours: 72 (72 lecture)
Introduction to the physical development of the earth. Emphasis on earth materials (rocks and minerals), hydrologic processes (weathering, streams, glaciers, beaches and ground water), tectonic processes (plate tectonics, earthquakes, mountain building and volcanism), and structures (folds, faults). Current theories on structure and evolution of the earth are discussed.
SBCC General Education: SBCCGE Area A Lecture
Transfer Information: CSUGE Area B1, IGETC Area 5A, CSU Transferable, UC Transferable
UC Transfer Limit: ERTH 111 and 111H combined: maximum credit, one course.
C-ID: GEOL 100.

ERTH 111L Dynamic Earth - Physical Geology Laboratory (1 Unit)
Corequisites: ERTH 111 (prior to or concurrently) or ERTH 111H (concurrently).
Hours: 54 (54 lab)
Laboratory approach to earth materials and processes, including rock and mineral identification and interpretation, plate tectonic rock cycle, topographic map and aerial photo interpretation, structural geology (folds and faults), geologic cross sections and geologic maps. Activities include four field trips to local areas of geologic interest. Required of all Geology majors.
SBCC General Education: SBCCGE Area A Lab
Transfer Information: CSUGE Area B3, IGETC Area 5C, CSU Transferable, UC Transferable
C-ID: GEOL 100L.

ERTH 112 History Of The Earth (3 Units)
Course Advisories: concurrent enrollment in ERTH 112L and ERTH 131 or ERTH 132.
Hours: 54 (54 lecture)
Introduction to the geologic history of the earth, using plate tectonic concepts, stratigraphy, geologic dating, fossils and evolution. Emphasis on the origin and evolution of continents, oceans, the atmosphere and life on earth. Designed to accommodate both non-science and science majors. Required of Geology majors.
SBCC General Education: SBCCGE Area A Lecture
Transfer Information: CSUGE Area B1, IGETC Area 5A, CSU Transferable, UC Transferable
C-ID: GEOL 110.

ERTH 112L Historical Geology Laboratory (1 Unit)
Corequisites: ERTH 112.
Skills Advisories: Eligibility for ENG 103.
Hours: 54 (54 lab)
Laboratory approach to understanding the scientific method as it applies to deciphering earth history. Topics include sedimentary rock identification and interpretation, stratigraphy, paleogeographic maps and fossil identification. Activities include field trips to local areas of geologic interest. Required of Geology majors.
SBCC General Education: SBCCGE Area A Lab
Transfer Information: CSUGE Area B3, IGETC Area 5A, IGETC Area 5C, CSU Transferable, UC Transferable
C-ID: GEOL 110L.

ERTH 114 The Geology of California (3 Units)
Hours: (54 lecture)
Landscapes of California interpreted by introductory plate tectonics. Volcanism, earthquakes, and other processes are studied in relation to features of the geomorphic provinces of the state. Provinces include the Sierra Nevada, Coast Ranges, Transverse Ranges, Cascades, Klamath Mountains, Modoc Plateau, Central Valley, Mojave, and the Basin and Range. Appropriate for science and non-science majors.
Transfer Information: CSUGE Area B1, IGETC Area 5A, CSU Transferable, UC Transferable

ERTH 115 Environmental Geology (3 Units)
Same as: ENVS 115
Course Advisories: Concurrent enrollment in ERTH 115/ENVS 115L and ERTH 131 or ERTH 132.
Hours: 54 (54 lecture)
Introduction to the problems of volcanism, earthquakes, fire, floods, landslides, and other geologic hazards; air and water pollution, hazardous materials and land use planning. Applications to the Santa Barbara area emphasized. Required of Environmental Studies majors.
SBCC General Education: SBCCGE Area A Lecture
Transfer Information: CSUGE Area B1, IGETC Area 5A, CSU Transferable, UC Transferable
C-ID: GEOL 130.

ERTH 115L Environmental Geology Laboratory (1 Unit)
Same as: ENVS 115L
Corequisites: ERTH 115/ENVS 115.
Hours: 54 (54 lab)
Laboratory approach to topics covered in ENVS 115, with emphasis on rock and mineral identification, hazard assessment, geologic resource management, and land use planning. In-lab field trips.
SBCC General Education: SBCCGE Area A Lab
Transfer Information: CSUGE Area B3, IGETC Area 5C, CSU Transferable, UC Transferable
C-ID: GEOL 130L.

ERTH 116 Energy and Natural Resources (3 Units)
Same as: ENVS 116
Hours: 54 (54 lecture)
Study of formation, exploration, development and judicious use of natural resources in relation to present and future energy requirements, including electricity, conservation, fossil fuels, solar, geothermal, nuclear and hydrogen. Required of Environmental Studies majors.
Transfer Information: CSUGE Area B1, IGETC Area 5A, CSU Transferable, UC Transferable

ERTH 122 Dinosaurs (3 Units)
Hours: 54 (54 lecture)
Introduction to the science of dinosaurs, stressing their evolution, ecology, bone structures and extinction. Emphasizes dinosaurian diversity, rise of dinosaurs, and their extinction in a Mesozoic world. Provides for a better perspective on the patterns and trends of all life, living and extinct. Scientific videos and fossil material used in the course.
Transfer Information: CSUGE Area B1, CSUGE Area B2, IGETC Area 5A, CSU Transferable, UC Transferable

ERTH 125 Mineralogy and Resources (5 Units)
Course Advisories: ERTH 111 or ERTH 112 and CHEM 101.
Hours: 162 (54 lecture, 108 lab)
Introduction to the identification and basic concepts of mineralogy, emphasizing crystallography, crystal chemistry, mineral chemistry, paragenesis of economic minerals and plate tectonics of mineral resources. A portion of the course is devoted to optical mineralogy. Hand-identification of minerals stressed.
Transfer Information: CSUGE Area B1, CSUGE Area B3, IGETC Area 5A, IGETC Area 5C, CSU Transferable, UC Transferable
UC Transfer Limit: ERTH 125 and 232B combined: maximum credit, one course.

ERTH 126 Petrology and Rock-Forming Minerals (5 Units)
Course Advisories: ERTH 111 or ERTH 112 and CHEM 101.
Hours: 162 (54 lecture, 108 lab)
Designed to familiarize students with the basic fundamentals and classification of rock-forming mineralogy, textures, origins and occurrences of igneous, sedimentary and metamorphic rocks. Use of the polarizer, X-ray and field identification procedures stressed.
Transfer Information: CSUGE Area B1, CSUGE Area B3, IGETC Area 5A, IGETC Area 5C, CSU Transferable, UC Transferable
UC Transfer Limit: ERTH 126 and 232A combined: maximum credit, one course.

ERTH 130V Geologic Field Studies - Hawaii Volcanology (2.5 Units)
Corequisites: ERTH 111 or 111H or 112 or 113 or 114 or 115 or ENVS 115 or ERTH 125 or 126 or 131 or 132 or 133 or 141 or GEOG 101 or ERTH 151.
Hours: 117 (9 lecture, 108 lab)
A twelve-day field-studies course with an emphasis on the structural, plutonic and volcanic features of Kilauea volcano, Hawaii. Kilauea's long-documented eruptive history and easy accessibility make it a training ground for USGS volcanologists. Focuses on the history and features of the volcano and its interactions with the people that live on it.
Transfer Information: CSU Transferable, UC Transferable

ERTH 131 Geologic Field Studies - Eastern Sierra Nevada (2 Units)
Corequisites: ERTH 111 or 111H or 112 or 113 or 114 or 115 or ENVS 115 or ERTH 122 or 125 or 126 or 132 or 141 or GEOG 101 or 106 or ERTH 151.
Hours: 72 (18 lecture, 54 lab)
Five-day field course to study and interpret the geologic features and history of the Eastern Sierra Nevada region. Topics include faults, volcanoes, glaciers, mining and tectonic history of the region. Fee required.
Transfer Information: CSU Transferable, UC Transferable
UC Transfer Limit: ERTH 113, 131, 132, 133, 135, 137, 138, 233, any or all of these courses combined: maximum credit, one course.

ERTH 132 Geologic Field Studies - Death Valley (2 Units)
Corequisites: ERTH 111 or ERTH 111H or ERTH 112 or ERTH 113 or ERTH 114 or ERTH 115 or ENVS 115 or ERTH 122 or ERTH 125 or ERTH 126 or ERTH 131 or ERTH 141 or GEOG 101 or 106 or ERTH 151.
Hours: 72 (18 lecture, 54 lab)
Five-day field course to study and interpret the geologic features and history of the Death Valley region. Topics include the volcanic, tectonic and hydrologic history of the region. Fee required; see department for information.
Transfer Information: CSU Transferable, UC Transferable
UC Transfer Limit: ERTH 113, 131, 132, 133, 135, 137, 138, 233, any or all of these courses combined: maximum credit, one course.

ERTH 133 Introductory Geologic Field Seminar - Colorado Plateau (4 Units)
Corequisites: ERTH 111 or ERTH 112 or ERTH 113 or ERTH 114 or ERTH 115 or ENVS 115 or ERTH 125 or ERTH 126 or ERTH 131 or ERTH 132 or ERTH 141 or GEOG 101 or ERTH 151.
Hours: 180 (18 lecture, 162 lab)
Fifteen-day intensive field study of the geology of the Colorado Plateau region. Emphasis on the geologic processes and features of the parks of the Southwest, including the Grand Canyon, Canyonlands, Arches, Capitol Reef, Bryce and Zion National Parks. Designed for students with previous geologic background. Fee required-see department for information.
Transfer Information: CSU Transferable, UC Transferable
UC Transfer Limit: ERTH 113, 131, 132, 133, 135, 137, 138, 233 any or all of these courses combined: maximum credit, one course.

ERTH 134 Geologic Field Studies - Western Sierra Nevada (2.5 Units)
Hours: 81 (27 lecture, 54 lab)
Fee required; contact department for information. Eight-day field course to study and interpret the geologic features and history of the western Sierra Nevada region. Topics include plutonism, landform evolution, glaciation, tectonic and geologic history, and uplift processes of the modern Sierra Nevada.
Transfer Information: CSU Transferable

ERTH 137 Introductory Field Geology (4.5 Units)
Prerequisites: ERTH 111 or ERTH112 or ERTH 125 or ERTH 126 or ERTH 131 or ERTH 132 or ERTH 133.
Course Advisories: ERTH 111L or ERTH 112L.
Hours: 153 (45 lecture, 108 lab)
Provides intensive field experience in application of field geology equipment, methods, techniques and maintenance procedures. “Hands-on” approach includes use of Brunton compass and tape, aerial photos, plane table and alidade, and geographical mapping.
Transfer Information: CSU Transferable, UC Transferable
UC Transfer Limit: ERTH 113, 131, 132, 133, 135, 137, 138, 233 any or all of these courses combined: maximum credit, one course.

ERTH 138 Geology Field Camp (4.5 Units)
Corequisites: ERTH 137.
Hours: 189 (27 lecture, 162 lab)
Summer Session that consists of 14 consecutive days at a geologic field camp, followed by five eight-hour days in an on-campus laboratory. Provides for rigorous work experience in field geology for Earth Science majors. Includes field mapping of a “badlands” area, using aerial photographs, topographic maps, geological surveying equipment and earth materials.
Transfer Information: CSU Transferable, UC Transferable
UC Transfer Limit: ERTH 113, 131, 132, 133, 135, 137, 138, 233 any or all of these courses combined: maximum credit, one course.

ERTH 141 Physical Geography (3 Units)
Same as: GEOG 101
Hours: 54 (54 lecture)
A spatial study of Earth's dynamic physical systems and processes. Interrelationships between the basic elements of the physical and human environments are examined, including geology (plate tectonics; volcanoes and earthquakes), geomorphology (formation and modification of landforms; river, coastal, and glacial processes), meteorology (Earth's atmosphere; weather and climate), and hydrology (water on Earth).
SBCC General Education: SBCCGE Area A Lecture
Transfer Information: CSUGE Area B1, IGETC Area 5A, CSU Transferable, UC Transferable
C-ID: GEOG 110, GEOG 115.

ERTH 141L Physical Geography Laboratory (1 Unit)
Same as: GEOG 101L
Corequisites: ERTH 141/GEOG 101.
Hours: 54 (54 lab)
Laboratory approach to a combination of earth science disciplines, including cartography, geology, geomorphology, meteorology and oceanography. Remote sensing techniques are utilized in 75% of laboratory activities.
SBCC General Education: SBCCGE Area A Lab
Transfer Information: CSUGE Area B3, IGETC Area 5C, CSU Transferable, UC Transferable
C-ID: GEOG 111, GEOG 115.

ERTH 142 Economic Geography (3 Units)
Same as: GEOG 105
Hours: 54 (54 lecture)
Explores the impact humans have on their environment and on each other through resource exploitation and economic activity. Investigates the development and global impact of diverse geographies, the effect of place on economic sectors, and the role of place in strengthening or weakening economies. Also addresses regional patterns of principal economic activities of the world, with an emphasis on economic development, urbanization, transportation and the environment.
SBCC General Education: SBCCGE Area B
Transfer Information: CSUGE Area D2, CSUGE Area D5, IGETC Area 4E, CSU Transferable, UC Transferable

ERTH 151 Introductory Physical Oceanography (3 Units)
Hours: 54 (54 lecture)
Designed for students desiring a broadly-based analysis of the physical aspects of the oceans. Study of the origin of the continents and oceans, marine geology, chemistry of seawater, currents, waves, tides and the ocean environment. Required of Marine Science majors.
SBCC General Education: SBCCGE Area A Lecture
Transfer Information: CSUGE Area B1, IGETC Area 5A, CSU Transferable, UC Transferable
UC Transfer Limit: ERTH 151 and BIOL 124 combined: maximum credit, one course.

ERTH 151L Introductory Physical Oceanography Laboratory (1 Unit)
Corequisites: ERTH 151.
Hours: 56 (56 lab)
Designed for students desiring a broadly-based analysis of the physical aspects of the oceans. Study of the origin of the continents and oceans, marine geology, chemistry of seawater, currents, waves, tides and the ocean environment. Required of Marine Science majors.
SBCC General Education: SBCCGE Area A Lab
Transfer Information: CSUGE Area B3, IGETC Area 5C, CSU Transferable, UC Transferable

ERTH 152 Weather and Climate (3 Units)
Same as: GEOG 152
Hours: 54 (54 lecture)
Fundamentals of meteorology, including the nature of the atmosphere, solar radiation and energy balances, circulation of the atmosphere, air masses and fronts, atmospheric moisture, clouds and fog, precipitation, cyclones, weather analysis and forecasting, climate, and climate change.
SBCC General Education: SBCCGE Area A Lecture
Transfer Information: CSUGE Area B1, IGETC Area 5A, CSU Transferable, UC Transferable
C-ID: GEOG 130.

ERTH 152L Weather and Climate Laboratory (1 Unit)
Same as: GEOG 152L
Corequisites: ERTH 152 or GEOG 152.
Hours: 54 (54 lab)
Laboratory approach to topics covered in the Weather and Climate lecture (ERTH 152/GEOG 152). Exercises introduce fundamentals of meteorology, including the nature of the atmosphere, circulation of the atmosphere, air temperature and humidity, and weather analysis and forecasting. Students collect and analyze a variety of environmental data.
SBCC General Education: SBCCGE Area A Lab
Transfer Information: CSUGE Area B3, IGETC Area 5C, CSU Transferable, UC Transferable

ERTH 171 Introduction To Geographic Information Systems And Maps (2 Units)
Same as: GEOG 171
Corequisites: ERTH 172 or GEOG 172.
Hours: 36 (36 lecture)
Techniques, tools and theories used to examine geographic information. Includes the structure, uses, and basic operations of a Geographic Information System (GIS). Cartography and cartographic design are incorporated, as well as overviews of aerial photography, remote sensing, and global positioning systems. Includes uses of GIS software in business, urban planning, resource management and scientific research.
Transfer Information: CSU Transferable, UC Transferable
C-ID: GEOG 155.

ERTH 172 Geographic Information Systems: Software Applications (2 Units)
Same as: GEOG 172
Corequisites: GEOG 171 or ERTH 171.
Hours: 54 (27 lecture, 27 lab)
Extensive practice with a GIS package, accompanied by exploration of the range of applications in which GIS is used (resource management, public works, business, planning, scientific research). Covers key skills for operating GIS software packages, including geographical data acquisition, creation, management, analysis and output.
Transfer Information: CSU Transferable, UC Transferable
C-ID: GEOG 155.

ERTH 231A Field Study - Mineralogy and Mineral Resources of the Eastern Sierra Nevada (2 Units)
Corequisites: ERTH 125.
Hours: 72 (18 lecture, 54 lab)
Concurrent Five-day field course to study and interpret the mineralogy and resources of the Eastern Sierra Nevada region. Topics include metallic and industrial mineral resources, energy resources and mining of the region. Fee required - see department for information.
Transfer Information: CSU Transferable, UC Transferable

ERTH 231B Field Study - Energy Resources of the Eastern Sierra Nevada (2 Units)
Prerequisites: ERTH 131 or ERTH 231A.
Hours: 72 (18 lecture, 54 lab)
Fee required - see department for information. Five-day field course to study and interpret the energy resources of the Eastern Sierra Nevada region. Topics include wind, solar-thermal electric, solar photovoltaic, micro hydropower, hydropower and geothermal energy resources of the region.
Transfer Information: CSU Transferable, UC Transferable

ERTH 232A Field Study - Petrology of the Death Valley Region (2 Units)
Corequisites: ERTH 126.
Hours: 72 (18 lecture, 54 lab)
Prerequisite or Five-day field course to study and interpret the petrology of the Death Valley region. Topics include field recognition and interpretation of igneous, sedimentary and metamorphic rocks, and mining of the region. Fee required - see department for information.
Transfer Information: CSU Transferable, UC Transferable
UC Transfer Limit: ERTH 126 and 232A combined: maximum credit, one course.

ERTH 232B Field Study - Mineral Resources and Plate Tectonic History of the Death Valley Region (2 Units)
Prerequisites: ERTH 132 or ERTH 232A.
Hours: 72 (18 lecture, 54 lab)
Five-day field course to study and interpret the mineral resources and tectonic history of the Death Valley region. Topics include field recognition and interpretation of rocks, mineral deposits, and structures of the region. Fee required - see department for information.
Transfer Information: CSU Transferable, UC Transferable
UC Transfer Limit: ERTH 125 and 232B combined: maximum credit, one course.

ERTH 233 Advanced Geologic Field Seminar - Colorado Plateau (4 Units)
Prerequisites: ERTH 133.
Hours: 170 (23 lecture, 147 lab)
15-day intensive field study of the geology of the Colorado Plateau region. Emphasis on the stratigraphy, tectonic evolution and geologic history of the parks of the Southwest, including the Grand Canyon, Canyonlands, Arches, Capitol Reef, Bryce and Zion National Parks. Designed for second-year geology students. Fee required - see department for information.
Transfer Information: CSU Transferable, UC Transferable
UC Transfer Limit: ERTH 113, 131, 132, 133, 135, 137, 138, 233 any or all of these courses combined: maximum credit, one course.

ERTH 299 Independent Study In Earth Science (1-4 Units)
Limitations on Enrollment: Completion of a minimum of 12 units at SBCC, with a 2.5 G.P.A., and a minimum of six units, with a 3.0 G.P.A. within the department.
Hours: 192 (192 lab)
For complete information, see "Independent Study" in the Catalog Index.
Course restricted to 3 repetitions
Transfer Information: CSU Transferable

Geography

GEOG 101 Physical Geography (3 Units)
Same as: ERTH 141
Hours: 54 (54 lecture)
A spatial study of Earth's dynamic physical systems and processes. Interrelationships between the basic elements of the physical and human environments are examined, including geology (plate tectonics; volcanoes and earthquakes), geomorphology (formation and modification of landforms; river, coastal, and glacial processes), meteorology (Earth's atmosphere; weather and climate), and hydrology (water on Earth).
SBCC General Education: SBCCGE Area A Lecture
Transfer Information: CSUGE Area B1, IGETC Area 5A, CSU Transferable, UC Transferable
C-ID: GEOG 110, GEOG 115.

GEOG 101L Physical Geography Laboratory (1 Unit)
Same as: ERTH 141L
Corequisites: GEOG 101/ERTH 141.
Hours: 54 (54 lab)
Laboratory approach to a combination of earth science disciplines, including cartography, geology, geomorphology, meteorology and oceanography. Remote sensing techniques are utilized in 75% of laboratory activities.
SBCC General Education: SBCCGE Area A Lab
Transfer Information: CSUGE Area B3, IGETC Area 5C, CSU Transferable, UC Transferable
C-ID: GEOG 111, GEOG 115.

GEOG 102 Human Geography (3 Units)
Hours: 54 (54 lecture)
An interpretation of the cultural elements of the geographic landscape and the study of human's changing relationship with the environment. Investigates culture and human processes as seen in global patterns of population and migration patterns, language, religion, political and economic systems, urbanization, and human impact on the physical world.
SBCC General Education: SBCCGE Area B, SBCCGE Area E5
Transfer Information: CSUGE Area D5, IGETC Area 4E, CSU Transferable, UC Transferable
C-ID: GEOG 120.

GEOG 104 World Regional Geography (3 Units)
Hours: 54 (54 lecture)
A global survey of cultural regions, people and environments. Geographic methodologies are employed to evaluate people, resources, landscapes, livelihoods and economies across eleven major geographic regions. The gap between developed and undeveloped economies, global roles and interconnections of countries and regions, and conflicting pressures between cultural diversity and globalization are analyzed.
SBCC General Education: SBCCGE Area B, SBCCGE Area E5
Transfer Information: CSUGE Area D5, IGETC Area 4E, CSU Transferable, UC Transferable
C-ID: GEOG 125.

GEOG 105 Economic Geography (3 Units)
Same as: ERTH 142
Hours: 54 (54 lecture)
Explores the impact humans have on their environment and on each other through resource exploitation and economic activity. Investigates the development and global impact of diverse geographies, the effect of place on economic sectors, and the role of place in strengthening or weakening economies. Also addresses regional patterns of principal economic activities of the world, with an emphasis on economic development, urbanization, transportation and the environment.
SBCC General Education: SBCCGE Area B
Transfer Information: CSUGE Area D2, CSUGE Area D5, IGETC Area 4E, CSU Transferable, UC Transferable

GEOG 106 Geography Of California (3 Units)
Hours: 54 (54 lecture)
A non-technical survey of the wide variety of natural and human environments found in California. Includes a regional study of physical landscapes, economic activities, characteristics of population, cities and rural areas, and current environmental problems. California's interaction with other parts of the U.S. and world is also covered.
SBCC General Education: SBCCGE Area B
Transfer Information: CSUGE Area D5, IGETC Area 4E, CSU Transferable, UC Transferable
C-ID: GEOG 140.

GEOG 107 Geography of The Middle East/North Africa and Southwest Asia (3 Units)
Hours: 54 (54 lecture)
This course explores the strategic location of the region, significance in world history, origins and development of culture, the impact of water and petroleum on the region, and the evolving geopolitics. This course attempts to explain, describe, and identify some of the pressing issues in the region through the lens of spatial relationships and locational significance.
SBCC General Education: SBCCGE Area B, SBCCGE Area E5
Transfer Information: CSUGE Area D, IGETC Area 4, CSU Transferable, UC Transferable

GEOG 123 Geography field studies- Death Valley (2 Units)
Corequisites: GEOG 101 or GEOG 106 or GEOG 152 or ERTH 111 or ERTH 111H or ERTH 112 or ERTH 114 or ERTH 115 or ERTH 141 or ERTH 152 or ERTH 151 or BOT 100 BOT 121 or ENVS 115.
Hours: 75 (21 lecture, 54 lab)
Prerequisite or A five-day Geography field study course in the Death Valley region. The course will assess, examine, and interpret the geography of the region. Topics include examination of the following in the Death Valley: climate, weather, tectonic processes, biogeography and human interaction with the region. A fee is required. See the Earth and Planetary Sciences department for details.
Transfer Information: CSUGE Area B3, IGETC Area 5C, CSU Transferable, UC Transferable

GEOG 152 Weather and Climate (3 Units)
Same as: ERTH 152
Hours: 54 (54 lecture)
Fundamentals of meteorology, including the nature of the atmosphere, solar radiation and energy balances, circulation of the atmosphere, air masses and fronts, atmospheric moisture, clouds and fog, precipitation, cyclones, weather analysis and forecasting, climate, and climate change.
SBCC General Education: SBCCGE Area A Lecture
Transfer Information: CSUGE Area B1, IGETC Area 5A, CSU Transferable, UC Transferable
C-ID: GEOG 130.

GEOG 152L Weather and Climate Laboratory (1 Unit)
Same as: ERTH 152L
Corequisites: GEOG 152 or ERTH 152.
Hours: 54 (54 lab)
Laboratory approach to topics covered in the Weather and Climate lecture (ERTH 152/GEOG 152). Exercises introduce fundamentals of meteorology, including the nature of the atmosphere, circulation of the atmosphere, air temperature and humidity, and weather analysis and forecasting. Students collect and analyze a variety of environmental data.
SBCC General Education: SBCCGE Area A Lab
Transfer Information: CSUGE Area B3, IGETC Area 5C, CSU Transferable, UC Transferable

GEOG 171 Introduction To Geographic Information Systems And Maps (2 Units)
Same as: ERTH 171
Corequisites: GEOG 172 or ERTH 172.
Hours: 36 (36 lecture)
Techniques, tools and theories used to examine geographic information. Includes the structure, uses, and basic operations of a Geographic Information System (GIS). Cartography and cartographic design are incorporated, as well as overviews of aerial photography, remote sensing, and global positioning systems. Includes uses of GIS software in business, urban planning, resource management and scientific research.
Transfer Information: CSU Transferable, UC Transferable
C-ID: GEOG 155.

GEOG 172 Geographic Information Systems: Software Applications (2 Units)
Same as: ERTH 172
Corequisites: GEOG 171 or ERTH 171.
Hours: 54 (27 lecture, 27 lab)
Extensive practice with a GIS package, accompanied by exploration of the range of applications in which GIS is used (resource management, public works, business, planning, scientific research). Covers key skills for operating GIS software packages, including geographical data acquisition, creation, management, analysis and output.
Transfer Information: CSU Transferable, UC Transferable
C-ID: GEOG 155.

GEOG 299 Independent Study In Geography (1-3 Units)
Limitations on Enrollment: Completion of a minimum of 12 units at SBCC, with a 2.5 G.P.A., and a minimum of 6 units, with a 3.0 G.P.A. within the department Student works under guidance and direction of sponsoring faculty member on project consistent with interests and abilities.
Hours: 144 (144 lab)
Minimal weekly meetings required. May be taken for one to three (3) units of credit; each unit of credit requires student to devote approximately three (3) hours per week to his/her project. For complete information, see "Independent Study" in the Catalog Index.
Transfer Information: CSU Transferable