Science, General

Math & Science Division

Program Description

This program is designed to provide students with a basic science background, preparing them to move into a curriculum at a four-year institution leading to a degree in such fields as chemistry, biology, physics, geology, or health sciences. This program is a path for immediate entry into science-based technology careers.

Associate in Arts Degree

The Associate in Arts Degree can be obtained by completing a total of 60 units, including a minimum of 18 units in the major, the general education requirements, and electives. The major consists of courses selected from the lists below and must include twelve (12) units in courses with laboratory work and at least one course in each of the areas Biological Science and Physical Science. All courses for this major must be completed with a grade of C or better or a P if the course is taken on a pass-no pass basis.

Required Courses

Biological Science

BIO 001*, 002*, 005*, 006*, 012, 012L*, 014*, 015*, 016, 018, 019*
ANTH 001

Physical Science

ASTR 010, 020*, 030, 040
CHEM 001*, 002*, 003*, 004*, 010*, 011*, 051
GEOG 001, 001L*
GEOL 001, 002*, 005
METR 010
PHSC 012*
PHYS 002*, 004*, 006*, 007*, 008*, 010

*Laboratory Class

Anthropology

ANTH 001 3 Units
Physical Anthropology
Course Advisory: SCC minimum English standards. An introduction to physical anthropology covering evolutionary theory, human disease and genetics, human variation and adaptation, primatology, primate and hominid evolution. Three hours lecture.

ANTH 002 3 Units
Cultural Anthropology
Course Advisory: SCC minimum English standards. Introduction to the study of human culture, with an emphasis on the changing relations between individual people, families, and other social groups, and various types of social inequality. We will also study cultural institutions from around the world, such as religion and magic, political and economic change, varieties of art forms, and the cultural future. Three hours lecture.

ANTH 007 3 Units
Prehistoric Archaeology
Course Advisory: SCC minimum English and Math standards. An introduction to the theories and methods of anthropological archaeology, with an emphasis on and an overview of prehistory. This course will stress the evolution of social systems and technology. Case studies from around the world will illustrate the various ways archaeology deciphers past behavior. Three hours lecture.

ANTH 049 2 Units
Anthropology Honors
Prerequisites: Completion of 24 units of college credit with a minimum GPA of 3.3; a minimum of 5 units in the discipline with a grade of “B” or better; an ability to work independently; and permission of the Division Dean based on instructor availability. Open to students qualified to do advanced work in the field. The program may include research, directed reading, field work, or other advanced study. Repeatable 1 time. Six hours weekly by arrangement.
**ASTRONOMY**

**ASTR 010**  
General Astronomy  
Course Advisories: Eligibility for ENGL 001 and SCC minimum Math standard. An introductory study of the universe, including the properties and evolution of galaxies, stars, pulsars, black holes, quasars, the sun, planets, and life in the universe. Three hours lecture.

**ASTR 020** 1 Unit  
Astronomy Laboratory  
Prerequisites: ASTR 010, 030, or 040 (they may be taken concurrently). Course Advisories: SCC minimum English and Math standards. Students will gain familiarity with the sky, telescopes, and other astronomical equipment. They will do experiments in physics related to astronomy. Topics will cover the moon, planets, stars, galaxies, and cosmology. Three hours lab.

**ASTR 030** 3 Units  
The Solar System  
Course Advisories: Eligibility for ENGL 001 and SCC minimum Math standard. An introductory study of solar system astronomy, the physics related to that astronomy, the planets and their moons, the sun, solar system debris, and the possibility of extraterrestrial life. Three hours lecture.

**ASTR 040** 3 Units  
Stars, Galaxies, and Cosmology  
Course Advisories: Eligibility for ENGL 001 and SCC minimum Math standard. An introductory study of stars, galaxies, the universe, and the physics related to these topics. This includes an examination of the facts relating to the sun, stellar lifetimes, supernovae, black holes, and cosmology. Three hours lecture.

**GEOGRAPHY**

**GEOG 001** 3 Units  
Physical Geography  
Course Advisory: SCC minimum English standards. An introductory study of Earth’s natural environment. The course includes a detailed analysis of weather, geologic landforms, climate, natural vegetation, the oceans and other natural environmental elements. Special emphasis is given to the human impact on the environment. Includes a one-day field trip. Three hours lecture.

**GEOG 001L* 1 Unit  
Physical Geography Laboratory  
Prerequisites: GEOG 001 (may be taken concurrently). Course Advisories: SCC minimum English and Math standards. A lab course to supplement GEOG 001 (Physical Geography). Emphasis will be placed on using the skills and tools of modern physical geography and analyzing and interpreting geographic data. Maps, aerial photographs, satellite images, weather instruments and computer analysis are stressed. NOTE: One or more field trips are required and may occur outside of class time. Three hours lab. (*U.C. transferability pending.)

**GEOG 002** 3 Units  
Cultural Geography  
Course Advisory: Eligibility for ENGL 001. Introduction to humans and their impact on the land. This course includes a detailed evaluation of man’s cultural world with special emphasis given to man’s religions, political states, population problems, and economic systems. Three hours lecture.

**GEOG 004** 3 Units  
World Geography  
Course Advisory: Eligibility for ENGL 001. Geographic study of the world’s major regions. Special emphasis is given to the major problems confronting humanity in these regions including an analysis of population growth, hunger and poverty, modification and destruction of the natural environment, and natural resource and energy problems. Three hours lecture.

**GEOG 010** 3 Units  
Introduction to Geographic Information Systems  
Course Advisory: SCC minimum English and math standards. Basic computer literacy is desirable. NOTE: Not open to students who have completed GEOG 010. Provides an in-depth introduction to the fundamentals of Geographic Information Systems (GIS). The course will include an introduction to basic cartographic principles including map scales, coordinate systems, and map projections. Various applications of GIS technology used in science, business, and government will also be presented. Specific topics covered in lectures will include an understanding of GIS terminology, raster and vector data structures, data sources and accuracy, methods of data acquisition, conversion and input, requirements for metadata, working with spatial data databases, and spatial analysis. The above topics will be reinforced in the laboratory with hands-on experience. (Same as GEOL 010.) Two hours lecture, three hours lab.

**GEOG 060** 3 Units  
Advanced Geographic Information Systems  
Prerequisite: GEOG 010 or GEOL 010. Course Advisory: SCC minimum English and Math standards. Basic computer literacy is desirable. Application of advanced analytical techniques of geographic information systems (GIS) to manipulate, analyze and predict spatial patterns. Students will work on individual projects to learn the issues involved in managing and representing spatial information. Two hours lecture, three hours lab.

**GEOG 061** 3 Units  
Introduction to Global Positioning Systems  
Course Advisory: SCC minimum English and Math standards. Basic computer literacy is desirable. An introduction to the Global Positioning System (GPS). Development of the GPS, operational characteristics, limitations, potential errors and applications will be covered. Activities with GPS receivers will be required. This course will prepare students for advanced course work in the GPS or for course work in Geographic Information Systems. Two hours lecture, three hours lab.
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GEOG 062 3 Units
Advanced Global Positioning Systems
Prerequisite: GEOG 061. Course Advisory: SCC minimum English and Math standards. An advanced course on the Global Positioning System (GPS). Advanced topics including data dictionaries, differential GPS and linking GPS to Geographic Information Systems will be covered. This course will prepare students for additional studies in specific applications of GPS or for course work in Geographic Information Systems. In addition, skills obtained in this course may allow students to seek employment in the spatial science field. Two hours lecture, three hours lab.

GEOL 001 3 Units
Physical Geology
Course Advisories: Eligibility for ENGL 001 and SCC minimum Math standard. Presents a study of the composition of the earth and the processes responsible for its present characteristics. Topics covered include plate tectonics, rocks and minerals, volcanism, metamorphism, sedimentation, weathering, erosion, landforms, earthquakes, glaciers, and mineral resources. Field trips may be taken to areas of geologic interest. A written research project, tests, and a comprehensive final examination will be used to evaluate student success. This course satisfies the physical science requirements for colleges and universities. Three hours lecture, plus field trips by arrangement.

GEOL 002 1 Unit
Geology Laboratory
Prerequisites: GEOL 001 or 005 (either may be taken concurrently). Course Advisories: SCC minimum English and Math standards. Topics include the identification of rocks and minerals as hand specimen and the study of geologic maps, landforms, and structures. Field trips will be taken to areas of geologic interest. Laboratory projects, written assignments and reports, and examinations will be used to evaluate student success. Three hours lab and discussion, plus field trips by arrangement.

GEOL 005 3 Units
Geology of California
Course Advisories: Eligibility for ENGL 001 and SCC minimum Math standard. An introductory course on the geology of California covering its geologic provinces, minerals (including gold), rocks, geologic hazards including earthquakes, and the development of scenic landscapes. Field trips will be taken to areas of geologic interest. Three hours lecture.

GEOL 010 3 Units
Introduction To GIS
Course Advisories: SCC minimum English and math standards; basic computer literacy is desirable. NOTE: Not open to students who have completed GEOG 010. Provides an in-depth introduction to the fundamentals of Geographic Information Systems (GIS). The course will include an introduction to basic cartographic principles including map scales, coordinate systems, and map projections. Various applications of GIS technology used in science, business, and government will also be presented. Specific topics covered in lectures will include an understanding of GIS terminology, raster and vector data structures, data sources and accuracy, methods of data acquisition, conversion and input, requirements for metadata, working with spatial data databases, and spatial analysis. The above topics will be reinforced in the laboratory with hands-on experience. (Same as GEOG 010.) Two hours lecture, three hours lab.

GEOL 049H 1-3 Units
Honors Geology
Prerequisites: Eligibility for the Honors program; GEOL 001 and 002 (either may be taken concurrently). Course Advisory: Eligibility for ENGL 001. Requires students to engage in an independent student project. The project may be a laboratory or field study or a library study that leads to a thesis. In all cases, the final written product should show integration and synthesis of ideas. Three to nine hours weekly by arrangement.

METEOROLOGY

METR 010 3 Units
Elements of Meteorology
Course Advisories: Eligibility for ENGL 001 and SCC minimum Math standard. A non-technical introduction to the science of meteorology and weather processes. Quizzes and tests and a comprehensive final exam will be used to evaluate student success. Three hours lecture.

PHYSICAL SCIENCE

PHSC 012 4 Units
Introduction to the Principles of Physical Science
Course Advisories: Eligibility for ENGL 001 and SCC minimum Math standard. An introduction to the physical universe from atomic particles to the stars, with emphasis on the basic principles of physics, chemistry, astronomy, and the geo-sciences. This is a general education course in the physical science area for non-science majors that satisfies the physical science requirement for most universities and colleges. Three hours lecture, three hours lab.

Special Topics
These courses, numbered 048 or 098 depending upon their transferability, are courses of contemporary interest centered on changing knowledge and important issues in the field. Announcements of Special Topics courses appear in the Schedule of Classes.