**Science, General**

**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.

**Program Outcomes**
Students who complete the Associate Degree will be able to:
1. Demonstrate analytical and/or conceptual problem solving skills.
2. Carry out experiments and critically assess their data.
3. Learn the role of hypotheses, measurement and analysis in the development of scientific theory as evidence by laboratory reports.
4. Learn how to write a laboratory report or give an oral presentation.

**BIOLOGICAL SCIENCE**
- BIO 002 * Principles of Cell and Molecular Biology
- BIO 003 * Evolution, Ecology & Biodiversity
- BIO 004 * Human Anatomy
- BIO 005 * Introductory Physiology
- BIO 012 Environmental Science
- BIO 012L * Environmental Science Laboratory
- BIO 014 Principles of Microbiology
- BIO 015 * Introduction to Biology
- BIO 016 Introduction to Human Biology
- BIO 018 Biology of Sex
- BIO 019 * Marine Biology

**PHYSICAL SCIENCE**
- ASTR 010 General Astronomy
- ASTR 020 * Astronomy Laboratory
- ASTR 030 The Solar System
- ASTR 040 Stars, Galaxies, and Cosmology
- CHEM 001 * General Chemistry
- CHEM 002 * General Chemistry
- CHEM 003 * Organic Chemistry I
- CHEM 004 * Organic Chemistry II
- CHEM 010 * Intermediate Chemistry
- CHEM 011 * Basic Organic Chemistry and Biochemistry
- CHEM 051 Chemistry for the Health Sciences
- GEOG 001 Physical Geography
- GEOG 001L * Physical Geography Laboratory
- GEOL 001 Physical Geology
- GEOL 002 * Geology Laboratory
- GEOL 005 Geology of California
- PHSC 012 * Introduction to Principles of Physical Science
- PHYS 002 * General Physics (Non-Calculus)
- PHYS 004 * General Physics (Non-Calculus)
- PHYS 006 * Physics for Science and Engineering
- PHYS 007 * Physics for Science and Engineering
- PHYS 008 * Physics for Science and Engineering
- PHYS 010 Descriptive Physics

*Laboratory Class
**Science, General**

**Associates in Arts in Geography for Transfer**

**Program Description**
Solano Community College offers an Associate in Arts for Transfer degree in Geography to introduce students to principles, theory, and applied methods of spatial analysis in studying both the natural and human environment. The degree provides students with a foundation in the knowledge and skills of the Geography profession and prepares them for upper division university course work. Recipients of the Associate in Arts for Transfer degree are guaranteed admission with junior standing at a campus of the California State University system. The program in Geography is designed to develop the student’s awareness of human environment relationships and changes in the physical and cultural landscape induced by human activities.

**Associates in Arts in Geography for Transfer**
The Associate in Arts in Geography for Transfer degree is especially designed for students who plan to complete a bachelor’s degree in Geography at a CSU campus. Students completing an Associate in Arts in Geography for Transfer degree are guaranteed admission to the CSU system, but not to a particular campus or major. Students transferring to a CSU campus that accepts the Associate in Arts in Geography for Transfer degree will be required to complete no more than 60 units after transfer to earn a bachelor’s degree. Solano Community College offers an Associate in Arts for Transfer degree in Geography to introduce students to principles, theory, and applied methods of spatial analysis in studying both the natural and human environment. The degree provides students with a foundation in the knowledge and skills of the Geography profession and prepares them for upper division university course work. Recipients of the Associate in Arts for Transfer degree are guaranteed admission with junior standing at a campus of the California State University system. The program in Geography is designed to develop the student’s awareness of human environment relationships and changes in the physical and cultural landscape induced by human activities.

Solano Community College offers an Associate in Arts for Transfer degree in Geography to introduce students to principles, theory, and applied methods of spatial analysis in studying both the natural and human environment. The degree provides students with a foundation in the knowledge and skills of the Geography profession and prepares them for upper division university course work. Recipients of the Associate in Arts for Transfer degree are guaranteed admission with junior standing at a campus of the California State University system. The program in Geography is designed to develop the student’s awareness of human environment relationships and changes in the physical and cultural landscape induced by human activities.

The Associate in Arts in Geography for transfer, which aligns with the Geography TMC, will prepare students for a baccalaureate degree in Geography. Geography provides insights about the earth as the human habitat. It is a way of looking at the earth, not an inventory of its contents. This viewpoint rests on fundamental interlocking concepts. The cultural appraisal of the earth, the regional concept, areal coherence, human ecology, spatial interaction, study of landscape, and the concept of change are all ways the geographer tries to better understand the environment.

**To earn the Associate in Arts in Geography for Transfer degree, students must:**

1. Complete 60 semester units or 90 quarter units that are eligible for transfer to the California State University, including both of the following:
   - (A) The Intersegmental General Education Transfer Curriculum (IGETC) or the California State University General Education – Breadth Requirements.
   - (B) A minimum of 18 semester units or 27 quarter units in a major or area of emphasis, as determined by the community college district.
2. Obtain a minimum grade point average of 2.0.

ADTs also require that students must earn a C or better in all courses required for the major or area of emphasis. A “P” (Pass) grade is not an acceptable grade for courses in the major.

**Program Outcomes**
Use maps and other appropriate geographic tools to interpret and analyze spatial data.
Explain the impact of humans on the natural environment.
Identify major worldwide spatial political, cultural, economic, and environmental patterns.
Science, General

Required Core ................................................. Units
GEOG 001 Physical Geography ......................... 3
GEOG 001L Physical Geography Laboratory .......... 1
GEOG 002 Cultural Geography.......................... 3
Select 2 courses (6 units) from List A ................. 6
Select 6 units from List B ................................... 6
Total Units ...................................................... 19

List A (Select 6 units) ................................. Units
GEOG 004 World Geography ............................ 3
GEOG 006 California Geography ..................... 3
GEOG 010 Introduction to Geographic Information Systems .......... 3

List B (Select 6 units) ......................................... Units
ANTH 002 Cultural Anthropology ....................... 3
GEOL 001 Physical Geology ............................ 3

Anthropology

ANTH 001 3.0 Units
Physical Anthropology
Course Advisory: SCC minimum English standard. An introduction to physical anthropology covering evolutionary theory, human disease and genetics, human variation and adaptation, primatology, primate and hominin evolution. Three hours lecture.

ANTH 001L 1.5 Units
Physical Anthro Laboratory
Prerequisite: ANTH 001 with a minimum grade of C (may enroll concurrently). Course Advisory: Eligibility for ENGL 001 and MATH 330. This introductory laboratory course is designed to familiarize students with the methods and materials of physical anthropology, and is intended to be a companion course to ANTH 1 (Physical Anthropology). This course provides hands-on experience with genetics exercises as well as the skeletal materials of modern humans, non-human primates, and fossil hominins. Other topics discussed include the scientific method, sources of biological variation (with special focus on variation in humans and non-human primates) and the forces of evolution, biological classification of the primates, and non-human primate behavior. A field trip may be required. One-half hour lecture, three hours lab.

ANTH 002 3.0 Units
Cultural Anthropology
Course Advisory: SCC minimum English standard. 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 3.0 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 2.0 Units
Anthropology Honors
Prerequisite: Completion of 24 units of college credit with a minimum GPA of 3.3; a minimum of 5 units in the discipline with a minimum grade of B; 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. Six hours weekly by arrangement.

Astronomy

ASTR 010 3.0 Units
General Astronomy
Course Advisory: Eligibility for English 001; 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. Field trip may be required. Three hours lecture.
## Science, General

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Units</th>
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<tbody>
<tr>
<td>ASTR 020</td>
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<td>ASTR 030</td>
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<td>GEOG 001</td>
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<td>GEOG 001L</td>
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<td>GEOG 002</td>
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<td>GEOG 004</td>
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<tr>
<td>GEOG 006</td>
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### ASTR 020: Astronomy Laboratory

Prerequisites: ASTR 010, 030, or 040 (courses may be taken concurrently). Course Advisory: Eligibility for English 001, SCC Minimum Math standard. 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. Field trips may be required. *Three hours lab.*

### ASTR 030: The Solar System

Course Advisory: Eligibility for English 001; 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. Field trips may be required. *Three hours lecture.*

### ASTR 040: Stars, Galaxies, and Cosmology

Course Advisory: Eligibility for English 001; 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. Field trip may be required. *Three hours lecture.*

### GEOG 001: Physical Geography

Course Advisory: Eligibility for English 001 and SCC minimum Math standard. This course is a spatial study of the Earth’s dynamic physical systems and processes. Topics include: Earth-sun geometry, weather, climate, water, landforms, soil, and the biosphere. Emphasis is on the interrelationships among environmental and human systems and processes and their resulting patterns and distributions. Tools of geographic inquiry are also briefly covered; they may include: maps, remote sensing, Geographic Information Systems (GIS) and Global Positioning Systems (GPS). Field trips may be required. *Three hours lecture.*

### GEOG 001L: Physical Geography Laboratory

Prerequisite: GEOG 001 with a minimum grade of C (may be taken concurrently). Course Advisory: Eligibility for ENGL 001 and SCC minimum Math standards. This course is designed to provide supplemental exercises in topics covered in Physical Geography lecture. Lab experience will include map analysis and interpretation, weather prognostication, landform processes and evolution, tectonics, biogeography, and habitat analysis. One or more field trips are required and may occur outside of class time. *Three hours lab.*

### GEOG 002: Cultural Geography

Course Advisory: Eligibility for English 001. This course is a study of diverse human populations, their cultural origins, diffusion and contemporary spatial expressions. Topics include: demography, languages and religions, urbanization and landscape modification, political units and nationalism, and economic systems and development. A field trip may be required. However, if the student cannot attend the field trip, there will be an optional research paper assignment. *Three hours lecture.*

### GEOG 004: World Geography

Course Advisory: Eligibility for English 001. Survey of the world’s culture regions and nations as interpreted by geographers, including physical, cultural, and economic features. Emphasis on spatial and historical influences on population growth, transportation networks, and natural environments. Identification and importance of the significant features of regions. A field trip may be required with the course. However, if a student cannot attend the trip, there will be an optional research paper assignment. *Three hours lecture.*

### GEOG 006: California Geography

Course Advisory: Eligibility for English 001. A thematic approach to the state’s issues, processes and topics relevant to geography including climate, landforms, natural vegetation, water resources, cultural landscape, ethnic diversity, urban and agricultural regions, and the economy. This course explores the physical, and human landscapes that have evolved as a result of the human-environment interface. A field trip is required. *Three lecture hours.*
Science, General

**GEOG 010** 3.0 Units
Introduction to Geographic Information Systems
Course Advisory: Eligibility for English 001 and SCC minimum Math standards. Basic computer literacy is desirable. Study of Geographic Information Systems (GIS) science and its applications to spatial data management. Identification and acquisition of GIS data. Assessment of vector and raster systems, scale, resolution, map projection, coordinate systems, georeferencing and Global Positioning Systems (GPS). Spatial analysis and modeling with GIS. Same as GEOL 010. Not open to students who have completed GEOL 010. Field trips may be required. Three hours lecture.

**GEOL 010** 3.0 Units
Introduction To Geographic Information Systems
Course Advisory: Eligibility for English 001 and SCC minimum Math standards. Basic computer literacy is desirable. Study of Geographic Information Systems (GIS) science and its applications to spatial data management. Identification and acquisition of GIS data. Assessment of vector and raster systems, scale, resolution, map projection, coordinate systems, georeferencing and Global Positioning Systems (GPS). Spatial analysis and modeling with GIS. Same as GEOL 010. Not open to students who have completed GEOL 010. Three hours lecture.

**GEOL 001** 3.0 Units
Physical Geology
Course Advisory: Eligibility for English 001 and SCC minimum Math standard. An introduction to the principles of geology with emphasis on Earth processes. This course focuses on the internal structure and origin of the Earth and the processes that change and shape it. Online work may be required. Three hours lecture.

**GEOL 002** 1.0 Units
Geology Laboratory
Prerequisite: GEOL 001.0 or 005 (either course may be taken concurrently). Course Advisory: 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.

**GEOL 005** 3.0 Units
Geology Of California
Course Advisory: 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. A field trip report will be required. If the student cannot attend the trip, they will have a research paper option. Three hours lecture.

**GEOL 049** 1 to 3.0 Units
Geology Honors
Prerequisite: Completion of 24 units of college credit with a minimum GPA of 3.0; completion of GEOL 001, GEOL 005, or GEOL 010 with a minimum grade of B; an ability to work independently; and permission of the Division Dean based on instructor availability. Course Advisory: Eligibility for English 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. This project requires the approval of a faculty member sponsor. Three to nine hours weekly by arrangement.

Physical Science

**PHSC 012** 4.0 Units
Introduction to Principles of Physical Science
Course Advisory: Eligibility for ENGL 001; 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. Field trips may be required. Three hours lecture, three hours lab.