Academic Programs

Six departments within the School of Natural Sciences and Mathematics offer Bachelor of Science, Bachelor of Arts, Master of Science and Master of Arts degrees as follows:

- Biology ......................... BS, MS, Minor
- Chemistry ....................... BS, Minor
- Computer Science .............. BS, Minor
- Geology .......................... BS, MS, Minor
- Mathematics ..................... BS, Minor
- Mathematics Teaching ........... MA
- Natural Science ................. BA
- Nursing .......................... BS, MS
- Physics ........................... BS, Minor

Pre-Engineering

The School of Natural Sciences and Mathematics offers several courses with the SCI prefix. Some are designed to satisfy the science requirements for the subject matter preparation program leading to a multiple subject credential. Others are offered as options to satisfy the General Education Theme I requirement in Natural Science and Technology. These courses are listed separately under SCIENCE.

Mission

The School of Natural Sciences and Mathematics has a tradition for excellence in teaching and providing a wealth of research opportunities to undergraduate and graduate students alike. The School is committed to providing an outstanding educational experience consistent with the University’s vision to be the leading campus in the CSU system in terms of faculty and academic excellence and diversity, quality of the student experience, and community engagement.

The objectives of the School of Natural Sciences and Mathematics are to:

- Offer required coursework in nursing, science and mathematics for students majoring in these disciplines or the teaching of these disciplines.
- Prepare students for leadership roles in the community.
- Promote science and health education for the purpose of improving the human condition.
- Foster scientific integrity in all professional endeavors.
- Prepare students for entry into the workforce in technical and healthcare services.
- Admit to graduate programs in this school, where they can earn advanced degrees in the sciences, or prepare for admission at other universities.
- Prepare students for admission to professional programs in nursing, medicine, dentistry, pharmacy, and other health professions.

COURSE DESCRIPTIONS

The School of Natural Sciences and Mathematics offers several courses with the SCIENCE prefix. The courses SCI 111, 112, 213, 214, 325A and 325B are designed to satisfy the science requirements for the subject matter preparation program leading to a multiple subject credential. The courses are open to majors in Liberal Studies and Child Adolescent and Family Studies and may not be used for science major or cognate requirements.

Other courses are offered as options to satisfy the General Education Theme I requirement in Natural Sciences and Technology.
**Lower Division**

**SCI 111 Introduction to Physics (4)**
Introduction to various fundamental principles of physics. Topics to be covered include classical mechanics, thermodynamics, electricity and magnetism, waves, and basic astronomical concepts. Laboratory exercises will be assigned to complement lecture materials. Three hours lecture and three hours laboratory. Prerequisites: Satisfaction of the Entry Level Mathematics requirement; MATH 221 recommended. Open only to majors in Liberal Studies or Child, Adolescent and Family Studies.

**SCI 112 Introduction to Chemistry (4)**
An introduction to basic chemical principles. Topics include: the periodic table of the elements, forms of matter and energy, molecular structure, chemical and physical properties. Three hours lecture and three hours laboratory. Prerequisites: Satisfaction of the Entry Level Mathematics requirement; MATH 221 recommended. Open only to majors in Liberal Studies or Child, Adolescent and Family Studies.

**SCI 213 Introduction to Biology (4)**
Introduction to basic biological principles from the cellular to the ecosystem level. Topics include: properties of living systems; structure and function of cells, organs and organ systems; DNA; inheritance; reproduction; ecosystems. Three hours lecture and three hours laboratory. Prerequisites: SCI 111 and SCI 112 or CHEM 150. Open only to majors in Liberal Studies or Child, Adolescent and Family Studies.

**SCI 214 Introduction to Earth Science (4)**
Introduction to the fundamentals of Earth Science, including the solid Earth, atmosphere and hydrosphere, and the Solar System. Interactions between Earth systems including rock cycle, weathering, the hydrologic cycle, and climate. Three hours lecture and three hours laboratory. Prerequisites: SCI 111 and SCI 112 or CHEM 150. Open only to majors in Liberal Studies or Child, Adolescent and Family Studies.

**SCI 277 Special Topics in Science (1-5)**
Topics and prerequisites to be announced. May be repeated for different topics.

**Upper Division**

**SCI 325A Integrated Life Science (4)**
Fundamental principles of science (e.g. mechanics, thermodynamics) applied to biological systems, including ecology, evolution, and the human body. Laboratories focus on developing skills in the experimental method and processes of science with an integrated focus on biological topics. Two hours lecture and six hours laboratory. Prerequisites: SCI 213 or BIOL 100, and SCI 214. Note: this is neither a methods of teaching nor curriculum development course; the focus is on science content and process for science literacy. Open only to majors in Liberal Studies or Child, Adolescent and Family Studies.

**SCI 325B Integrated Earth Science (4)**
Fundamental principles of science (e.g. mechanics of motion, electricity and magnetism, the bonding of elements, energy) applied to the Earth and Solar System through an integrated approach, with examples from California and Kern County. Two hours lecture and six hours laboratory. Prerequisites: SCI 213 or BIOL 100, and SCI 214. Note: this is neither a methods of teaching nor curriculum development course; the focus is on science content and process for science literacy. Open only to majors in Liberal Studies or Child, Adolescent and Family Studies.

**SCI 351A Introduction to Weather Dynamics (5)**
This is an introductory course with a large on-line component on the fundamentals of atmospheric science. Current weather data are accessed via the Internet, and learning activities are keyed to the day's weather. General topics are studied such as how one characterizes various phenomena and meteorological effects, and how these are measured. This course satisfies Theme 1 and may not be
used to satisfy physics major or minor requirements. Prerequisites: Successful completion of General Education Areas A and B. GE T1

SCI 351B Energy and Technology (5)
Energy in a technological society. Sources and resources of energy. Effects of energy on the environment. This course satisfies Theme 1 and may not be used to satisfy physics major or minor requirements. Prerequisites: Successful completion of General Education Areas A and B. GE T1

SCI 352A California Geology and Society (5)
Introduction to the Geology of California with emphasis on the mutual interactions of society with its physical environment. After a brief introduction of geology fundamentals, the course will cover the geological evolution of California, geological resources (e.g., minerals, raw building materials, petroleum, soils, groundwater), geological hazards (e.g., landslides, volcanic eruptions, floods, earthquakes), and societal impacts on the physical environment. Examples will be regularly given from all over California. Satisfies Theme 1. Prerequisite: Successful completion of General Education Areas A and B. GE T1

SCI 352B Water and the West (5)
This course examines historical and present-day issues regarding the use of surface and ground water in the arid southwestern U.S.-particularly California-in an objective and scientific manner. The course is intended for non-science majors and is designed to make them aware of the heavy impact that waste and contamination have on our finite water supply. Satisfies Theme 1. Prerequisites: Successful completion of General Education Areas A and B. GE T1

SCI 352C Earth Systems and Global Change (5)
Origin, development and systematic links between the atmosphere, biosphere, cryosphere, hydrosphere and lithosphere. Human effects on these systems: causes, impacts and mitigations, with emphasis on current societal issues regarding local and global climatic and environmental change. Prerequisites: Successful completion of General Education Areas A and B. GE T1

SCI 353 Computers and Society (5)
This course will provide a framework for examining the social context and consequences of information technology. Society, social change, and effects on the individual related to the use of computers will be the major concentrations. Emphases will include values, ethics, patterns, future directions, and relevant theories related to this phenomenon. Prerequisites: Successful completion of General Education Areas A and B. GE T1

SCI 354 The Nature of Science and Technology in a Modern Society (5)
The nature of science and technology will be explored with emphases placed on the structure of knowledge, and its use in society; the relationship of science and technology to a modern society will be considered in terms of approaches to problems, decision-making skills and effects on the quality of life. Prerequisites: Successful completion of General Education Areas A and B. GE T1

SCI 355A Human Biology (5)
Current topics in human biology, which include growth and development, form and function, fitness and health, interaction with the environment, and evolution. Five hours lecture. Not acceptable for major or minor. Prerequisites: Successful completion of General Education Areas A and B. GE T1

SCI 355B Insects and People (5)
Overview of the global impact of insects on human concerns, including the overwhelming abundance and diversity of insects, the role of insects as disease vectors to humans, livestock, and pets, and the impact of insects as agricultural pests, and pollinators. Five hours lecture. This course may not be used to satisfy biology major or minor requirements. Prerequisite: Successful completion of General Education Areas A and B. GE T1

SCI 355C Biology of Sex (5)
Why do humans have sex in private and for fun rather than procreation? Human sexual practices are unusual when compared with animals, plants and microorganisms in that humans have menopause, concealed ovulation, and monogamy. In this course human sexuality is compared against the broad spectrum of sex in all organisms. Five hours lecture. Not acceptable for major or minor. Prerequisites: Successful completion of General Education Areas A and B. **GE T1**

**SCI 355D Microbiology and the Human Condition (5)**
Introduces the non-science student to the wonders of the incredible diversity in the unseen microbial world that flourishes in and around us. Emphasizes the relevance of microbes and their role in everyday lives, especially their roles in communicable and sexually transmitted diseases, food borne illnesses and bioterrorism. Five hours lecture. Not acceptable for the major or minor. Prerequisite: Successful completion of General Education Areas A and B. **GE T1**

**SCI 355E California Natural History (5)**
Plants, animals, ecology and biogeography of California with emphasis on fostering an appreciation of the relationships between people and California’s amazing biodiversity. Five hours lecture. Not acceptable for major or minor. Prerequisites: Successful completion of General Education Areas A and B. **GE T1**

**SCI 477 Special Topics in Science (1-5)**
Topics and prerequisites to be announced. May be repeated for different topics.