SCIENCE COURSE DESCRIPTIONS

Biology and the Living Earth

UC/CSU: d
NCAA: yes
Placement Guidelines: Grades 9

Biology and the Living Earth Honors emphasizes the understanding of the nature of living things, their environment, and their relationships with man. Biology and the Living Earth is one of three courses in California's three-course model for high schools implementing the Next Generation Science Standards (NGSS). To highlight the nature of Earth and space sciences (ESS) as an interdisciplinary pursuit, the course presents an integration of ESS and Biology.

Biology and the Living Earth Honors

UC/CSU: d
NCAA: yes
Placement Guidelines: Grades 9

Biology and the Living Earth Honors emphasizes an understanding with depth and complexity of the nature of living things, their environment, and their relationships with man. Biology and the Living Earth is one of three courses in California's three-course model for high schools implementing NGSS. To highlight the nature of Earth and space sciences (ESS) as an interdisciplinary pursuit the course presents an integration of ESS and Biology. The honors course in Biology is distinguished by the depth and scope of work required to show mastery of the skills with increased rigor and complexity beyond the scope of a general course.

Biology Advanced Placement

UC/CSU: d
NCAA: yes
Placement Guidelines: Grades 10-12

Biology Advanced Placement (AP) includes those topics regularly covered in a college biology course for majors: molecules and cells, heredity and evolution, and organisms and populations. The Biology (AP) course differs significantly from the usual high school course with respect to the kind of textbook used, the range and depth of topics covered, the kind of laboratory work done by students, and the time and effort required of students. This course utilized the Biology (AP) curriculum provided by the College Board. The Biology AP course is designed to be the equivalent of a college introductory biology course usually taken by biology majors during their fist year of college. By taking the course and passing the Biology AP examination, some students, as college freshmen, are permitted to enroll in upper-level courses in biology or to register for courses for which biology is a prerequisite.

Chemistry of the Earth Systems

UC/CSU: d
NCAA: yes
Placement Guidelines: Grades 10-12

Chemistry in the Earth Systems entails the understanding of the nature of matter and its transformations when they study atomic and molecular structure, the effects of electron interaction, chemical bonds, and stoichiometry. Additionally, the course offers the study of the

properties of gases, acids and bases, solutions, and organic and inorganic compounds and an exploration of chemical systems through various reactions.

Chemistry of the Earth Systems Honors

UC/CSU: d
NCAA: yes
Placement Guidelines: Grades 10-12

Chemistry in the Earth Systems Honors entails the advanced understanding of the nature of matter and its transformations when they study atomic and molecular structure, the effects of electron interaction, chemical bonds, and stoichiometry. Additionally, the course offers the study of the properties of gases, acids and bases, solutions, and organic and inorganic compounds and an exploration of chemical systems through various reactions. Chemistry in the Earth System Honors is one of three courses in California's three-course model for high schools implementing the Next Generation Science Standards (NGSS). To highlight the nature of Earth and space sciences (ESS) as an interdisciplinary pursuit with crucial importance in California, the course presents an integration of ESS and Chemistry. The honors course in Chemistry is distinguished by the depth and scope of work required to show mastery of the skills with increased rigor and complexity beyond the scope of a general course.

Chemistry Advanced Placement

UC/CSU: d
NCAA: yes
Placement Guidelines: Grades 11-12

The Advanced Placement (AP) Chemistry course is designed to be taken only after the successful completion of a first course in high school chemistry. Students enrolled in Chemistry AP attain a depth of understanding of fundamentals and a reasonable competence in dealing with chemical problems. The course contributes to the development of the students' abilities to think clearly and to express their ideas, orally and in writing, with clarity and logic. This course differs qualitatively from the regular high school Chemistry course with respect to the kind of textbook used, the topics covered, the emphasis on chemical calculations and the mathematical formulation of principles, and the kind of laboratory work done by students. Quantitative differences appear in the number of topics covered, the time spent on the course by students, and the nature and the variety of experiments done in the laboratory. This course fulfills the laboratory science requirement for UC admission and utilizes the Chemistry AP curriculum provided by the College Board.

Environmental Science Advanced Placement

UC/CSU: d
NCAA: yes
Placement Guidelines: Grades 10-12

The goal of the AP Environmental Science course is to provide students with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world, to identify and analyze environmental problems both natural and human-made, to evaluate the relative risks associated with these problems, and to examine alternative solutions for resolving or preventing them. Environmental science is interdisciplinary; it embraces a wide variety of topics from different areas of study. Yet there are several major unifying constructs, or themes, that cut across the many topics included in the study of environmental science. This course utilizes the AP Environmental Science curriculum provided by the College Board. The exam is representative of such a course and therefore is considered appropriate for

the measurement of skills and knowledge in the field of environmental science. This course utilizes the AP Environmental Science curriculum provided by the College Board. www.collegeboard.com. The AP Environmental Science course is designed to be the equivalent of a one semester, introductory college course in environmental science.

Physics H

UC/CSU: d
NCAA: yes
Placement Guidelines: Grades 10-12

Physics is the study of the physical world and deals with the behavior and structure of matter. The study of physics is divided into the areas of motion, fluids, heat, sound, light, electricity and magnetism, relativity, atomic structure, nuclear physics, and elementary particles. Students will use basic concepts, equations, and assumptions to describe the physical world and develop an understanding of the tools of physics.

Physics in the Universe

UC/CSU: d
NCAA: yes
Placement Guidelines: Grades 9-12; Requires IM2 or Higher

This course is a laboratory science course designed for the college-bound student that emphasizes students' ability to demonstrate their knowledge of Physics within the context of the Science and Engineering Practices delineated in the Next Generation Science Standards (NGSS). This course specifically examines the role of Physics Laws and processes in driving the Earth system.

Physics 1 Advanced Placement

UC/CSU: d
NCAA: yes
Placement Guidelines: Grades 10-12

AP Physics 1 is an algebra-based, introductory college-level physics course. Students cultivate their understanding of physics through inquiry-based investigations as they explore topics such as Newtonian mechanics (including rotational motion); work, energy, and power; mechanical waves and sound; and introductory, simple circuits.

Physics 2 Advanced Placement

UC/CSU: d
NCAA: yes
Placement Guidelines: Grades 10-12

AP Physics 2 is an algebra-based, introductory college-level physics course. Students cultivate their understanding of physics through inquiry-based investigations as they explore topics such as fluid statics and dynamics; thermodynamics with kinetic theory; PV diagrams and probability; electrostatics; electrical circuits with capacitors; magnetic fields; electromagnetism; physical and geometric optics; and quantum, atomic, and nuclear physics.

Human Anatomy and Physiology

UC/CSU: d
NCAA: yes

Placement Guidelines: Grades 10-12

Human Anatomy and Physiology is a second year, advanced course for the college preparatory student who wishes to acquire a greater breadth and depth of knowledge of the principles of advanced biology with an emphasis of anatomy and physiology. This course is designed to give students a more specific understanding of how the human body works. The major organ systems of the body, the structures and their functions are covered thoroughly, as well as those general and most common problems and disorders. This course is designed to expose students who desire to further their education and are curious about and/or are contemplating a profession in the medical field. Homework and laboratory work are an important part of the curriculum. This course provides students a laboratory class that fulfills the state graduation requirement for life science and fulfills an entrance requirement for the UC/CSU level schools.

Human Anatomy and Physiology Honors

UC/CSU: d
NCAA: yes
Placement Guidelines: Grades 10-12

Human Anatomy and Physiology is a second year, advanced course for the college preparatory student who wishes to acquire a greater breadth and depth of knowledge of the principles of advanced biology with an emphasis of anatomy and physiology. This course is designed to give students a more specific understanding of how the human body works. The major organ systems of the body, the structures and their functions are covered thoroughly, as well as those general and most common problems and disorders. This course is designed to expose students who desire to further their education and are curious about and/or are contemplating a profession in the medical field. Homework and laboratory work are an important part of the curriculum. This course provides students a laboratory class that fulfills the state graduation requirement for life science and fulfills an entrance requirement for the UC/CSU level schools.

Principals of the Biomedical Science (PLTW)

UC/CSU: d
NCAA: yes
Placement Guidelines: Grades 9-12

This course will provide additional science and engineering instruction for the college-bound student as well as certain healthcare information. This course provides an introduction to the biomedical sciences through exciting "hands-on" projects and problems. Student work involves the study of human medicine, research processes and an introduction to bio-informatics. The Biomedical Sciences program prepares students for a career in the field of biomedical sciences. This course is aligned to the Project Lead the Way program.

Human Body Systems (PLTW)

UC/CSU: d
NCAA: yes
Placement Guidelines: Grades 10; Requires Biomedical Science (PLTW)

This course will engage students in the study of the processes, structures and interactions of human body systems. Important biomedical concepts in the course include: communication, transport of substances, locomotion, metabolic processes, identity, and protection. The central theme will focus on how the body systems work together to maintain homeostasis and good health. The systems will be studied as "parts of a whole," working together to keep the amazing

human machine functioning at an optimal level. Exploring science in action, students will work through interesting real world cases and often play the role of biomedical professionals to solve medical mysteries.

Forensic Biology

UC/CSU:
NCAA:
Placement Guidelines: Requires Biology and Chemistry

Forensic Biology is a college preparatory, laboratory-based introduction to the investigation of crime scenes by collecting and analyzing physical evidence. This course is designed to integrate the core scientific disciplines(as outlined in the California State Science Standards for grades 9 - 12) while providing students both theory and hands-on experience with the skills and knowledge required of a forensic crime scene investigator. This multidisciplinary approach will highlight topics in DNA, genetics, anatomy, chemistry, physics, entomology, botany, and investigative techniques. These will be supplemented with case studies and aspects of earth science, mathematics, medicine, technology, and sociology. In addition, the ethical, legal, and social concerns surrounding forensics will be discussed. Sample evidence for analysis will include, but is not limited to, fingerprints, DNA, projectiles and trajectories, ballistics, hair, fibers, toxicology, blood spatter patterns, chromatography, entomology, soil samples, plant materials, and impressions. Students will practice process skills such as comparative analysis, critical thinking, deductive reasoning, interviewing, observation, organization, problem solving, research, communication, evidence collection, lab safety, and technical reading. Project-based learning through laboratory investigations, discussions/class lecture will be the primary mode of content delivery to be supplemented by guest speakers with field experience and expertise.