

# 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 first 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,

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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

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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](http://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**

**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 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

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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.