

# Science Department

**Minimum graduation requirement: 20 credits**

## **AP ENVIRONMENTAL SCIENCE**

Grade 9-12

10 credits

Prerequisite for 9<sup>th</sup> grade: Students must have an A/B average in 8th grade Enriched English, and 8th grade science. Students also must be enrolled in Geometry IA or a more advanced math class.

Prerequisite for 10<sup>th</sup>-12<sup>th</sup> grade: Students must pass Biology with a grade of "B". A parent/student meeting is held in the spring where the course will be discussed and applications will be handed out. Those students that are accepted will meet at the start of summer to receive the materials and textbooks for their summer work. Summer work will be due throughout the summer. Those students that do not complete the summer work will not be allowed to stay in the class.

The goal of the AP Environmental Science course is to provide college bound students with the scientific principles, concepts, and methodologies required to understand the relationships 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 and 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. (CSF-I)

## **EARTH SCIENCE I**

Grade 9

10 credits

Prerequisite: Recommendation from 8th grade science teacher

Earth Science I is a one-year college prep science class that is designed to provide 9th grade students with an understanding of the Earth system and its processes. Special emphasis will be placed on the achievement of the California State Earth Science Standards. This course will include a laboratory component that will compliment the information covered in the class. The topics covered in first semester will include the scientific method, the metric system, earthquakes, volcanoes, plate tectonics, physical aspect of the oceans, the atmosphere, weather, air pressure, and climate. During the second semester we will cover the origin of modern astronomy, our solar system, astronomical observations, the sun and stars, running water, ground water, glaciers, deserts and severe storms. California geology will be incorporated throughout the year. (CSF-II)

## **SDAIE EARTH SCIENCE**

Grade 9

10 credits

Prerequisite: Recommendation from 8th grade science teacher

Earth Science I is a one-year college prep science class that is designed to provide 9th grade students with an understanding of the Earth system and its processes. Special emphasis will be placed on the achievement of the

California State Earth Science Standards and vocabulary. This course will include a laboratory component that will compliment the information covered in the class. The topics covered in first semester will include the scientific method, the metric system, earthquakes, volcanoes, plate tectonics, the physical aspect of the oceans, the atmosphere, weather, air pressure, and climate. During the second semester we will cover the origin of modern astronomy, our solar system, astronomical observations, the sun and stars, running water, ground water, glaciers, deserts and severe storms. California geology will be incorporated throughout the year. (CSF-II)

**BIOLOGY ADVANCED PLACEMENT A/B**

Grades 10-12

10 credits

Prerequisites: Teacher and Counselor recommendation. High level of achievement in completed Science and English courses.

This is a one year college level course that covers all areas in Biology and prepares the student for the Advanced Placement Examination. Laboratory exercises will also be provided to coincide with specific areas of instruction. Summer work and attendance at weekend labs required. Areas of instruction will include Molecular and Cellular Biology, Organismal Biology and Population Biology. (CSF-I)

**BIOLOGY A/B**

Grade 9-12

10 credits

Prerequisite for 9<sup>th</sup> grade: Student must have completed or be concurrently enrolled in Geometry IA.

Biology A/B (Biological Science Curriculum Study) is a one-year course geared toward college bound students. This course promotes an interest in the subject through laboratory inquiry and investigation. This course emphasizes the California Biological State Standards through the newest areas of research and technology in the Biological Sciences, namely the molecular approach. (CSF-I)

Fall

Introduction  
Biochemistry  
Cells & Homeostasis  
Photosynthesis & Respiration  
Human Biology

Spring

Cell Reproduction  
Genetics  
DNA, RNA & Protein Synthesis  
Biotechnology  
Evolution  
Ecology

**SDAIE BIOLOGY**

Grade 9-12

10 credits

Biology A/B (Biological Science Curriculum Study) is a one-year course. This course promotes an interest in the subject through laboratory inquiry and investigation. This course emphasizes the California Biological State Standards through the newest areas of research and technology in the Biological Sciences, namely the molecular approach. (CSF-I)

Fall

Introduction  
Biochemistry  
Cells & Homeostasis  
Photosynthesis & Respiration  
Human Biology

Spring

Cell Reproduction  
Genetics  
DNA, RNA & Protein Synthesis  
Biotechnology  
Evolution  
Ecology

**CHEMISTRY A/B**

Grades 10-12

10 credits

Prerequisite: Student must have completed or be concurrently enrolled in Geometry.

This college preparatory chemistry course stresses the laboratory approach and will include such major topics as the following:

- |                   |                                 |
|-------------------|---------------------------------|
| a) atomic theory  | g) energy relationship          |
| b) stoichiometry  | h) hydrocarbons                 |
| c) gas-laws       | I) periodicity                  |
| d) solutions      | j) writing formulas             |
| e) periodic table | k) balancing chemical equations |
| f) bonding        | l) acid/bases                   |
|                   | m) nuclear chemistry            |

A student notebook will be required. Students must purchase safety goggles for use during laboratory work. A large portion of the course will involve work in the laboratory collecting data, analyzing data and drawing valid conclusions. Course utilizes the Addison-Wesley Chemistry textbook and lab manual. (CSF-I)

**CHEMISTRY ADVANCED PLACEMENT A/B**

Grades 11-12

10 credits

Prerequisite: Teacher/counselor approval. Concurrent enrollment in Algebra II/Trig. Minimum GPA of 3.7. If student has taken a regular chemistry course with a passing grade, the minimum GPA of 3.7 GPA will be waived.

This is a one-year, college level course that provides a broad, yet rigorous, introduction to chemistry for the students whose mathematical preparation includes algebra. The principal areas of study include: stoichiometry, gas, thermodynamics, periodicity, chemical bonding, kinetics, acids and bases, electrochemistry, nuclear reactions and organic chemistry. There will be up to four (4) Saturday classes in April/May to prepare for the Advanced Placement examination. Lab exercises will also be provided to coincide with specific areas of instruction. Summer work is required. The online program, Web-assign, will be used to evaluate homework and take-home quizzes. (CSF-I)

**HUMAN ANATOMY AND PHYSIOLOGY HONORS**

Grades 10-12

10 credits

Prerequisite: Grade of "B" or better in Biology or qualifying grade on an entrance exam and teacher recommendation.

This is a one year course in human anatomy and physiology utilizing a college textbook as a resource. It covers all human body systems in detail. Extensive labs will compliment specific segments of the course and a possible detailed dissection of a mammal will provide hands on experience. This course will benefit students wishing to continue their education in the life sciences. (CSF-I)

**HUMAN ANATOMY AND PHYSIOLOGY**

Grades 10-12

10 credits

Prerequisite: Grade of "C" or better both semesters in a Biology class and must pass first semester to continue.

This is a two semester course covering the basic structure and functions of the human body. This is an ideal class for any student wishing to continue their science education. This course is particularly valuable for the student who

has an interest in pursuing a career in health related fields. There will be numerous hands-on activities, labs, experiments, and dissections. Human illness and disease will be discussed when applicable. (CSF-I)

**PHYSICS ADVANCED  
PLACEMENT A/B**

Grades 10-12

10 credits

Prerequisite: Completion of Algebra II/Trig with concurrent enrollment in Pre-Calculus highly encouraged and teacher approval.

This is a one year, college level course that provides a broad, yet rigorous, introduction to physics for the students whose mathematical preparation includes algebra and trigonometry. No calculus is needed. The principal areas of study include: mechanics, thermodynamics, electricity, magnetism, waves, optics, and modern physics. There will be up to four (4) Saturday classes in April/May to prepare for the Advanced Placement examination. There is an optional \$10.50 materials cost for this class. (CSF-I)

**PHYSICS ADVANCED PLACEMENT C, Mechanics**

Grades 10-12

10 credits

Prerequisite: Concurrent enrollment in Calculus, a grade 3, 4, or 5 on the AP Physics B test, and teacher approval.

This is a one-year, college level course that is equivalent to the first physics calculus based physics class in a college physics or engineering sequence. Strong motivation, a creative mind, and smart study skills are essential for success. There is an optional \$10.50 materials cost for this class. (CSF-1)

**PHYSICS A/B**

Grades 11-12

10 credits

Prerequisite: Concurrently enrolled in Algebra II/Trig or higher.

This course provides an excellent introduction to physics at the college level with emphasis on logical thinking. A minimum purchase of materials at the end of the second semester will be required. (CSF-I) There is an optional \$10.50 materials cost for this class.

First semester:

*mechanics*

Second semester:

*electric fields  
magnetic fields  
electric circuits  
waves and optics  
relativity  
modern physics*

