

SCIENCE 4000s



*‡Advanced Placement Biology

The Advanced Placement Biology course is designed by the College Board to help students develop critical thinking skill in the areas of Chemistry, Cell Structure, Genetics, Evolution, Taxonomy and Ecology, as well as the relationships between biological structures and functions. Major themes include Science as a Process, Interdependence in Nature, and Technology. Students must maintain a C or better each term to continue in the course. Fees will be used for consumable chemicals, lab kits, live organisms, indicators, dialysis tubing, and foods. **Students may take the national AP exam (\$97 exam fee) in May for possible college CREDIT.**

GRADE LEVEL: 11-12

CREDIT: 1.0

FEES: \$30 and students will purchase their own text and lab manuals.

LENGTH: Year

PREREQUISITE: *Genetics, plus application and teacher consent.*

*‡Advanced Placement Chemistry

AP chemistry is a full-year course in advanced general chemistry. Students who successfully complete this course will be well-prepared to take the Advanced Placement Chemistry test in order to place themselves in a second semester chemistry course when they enter college. Students will complete advanced labs using more advanced analytical equipment. Students must earn a "C" or better each term to continue in the course. Fees will be used for chemicals, lab ware, lab kits. **Students may take the national AP exam (\$97 exam fee) in May for possible college CREDIT.**

GRADE LEVEL: 11-12

CREDIT: 1.0

FEES: \$30 and students will purchase their own books

LENGTH: Year

PREREQUISITE: *Chemistry and previous or concurrent enrollment in Precalculus plus application & teacher consent.*

*‡Advanced Placement Physics

AP Physics is a full-year of advanced general physics. Students who have begun the journey through physics in the general physics or with the instructors approval in Engineering 2 will choose to prepare for either the Physics B or Physics C exam. Students who successfully complete this course should be well equipped to attack the difficulties of college physics. Any student who is thinking of careers in engineering, math, physical science or medical sciences in the future should take this course. **Students may take the national AP exam (\$97 exam fee) in May for possible college CREDIT.**

GRADE LEVEL: 11-12

CREDIT: 1.0

FEES: \$25 and students will purchase their own books

LENGTH: Year

PREREQUISITE: *Physics or Engineering 2 with teacher consent*

*Astronomy

In astronomy, students increase understanding about our amazing universe and learn to make predictions about astronomical events. Building models will enable students to try out ideas. This course will capture the students' imaginations and introduce them to the fundamental ideas of science and math. The main concepts studied will be the moon's and sun's cycles, stellar evolution, star constellations, and the solar system. This is a lab oriented class in which the students will keep astronomical journals and use the Starlab Planetarium. Fees are for supplies--consumable items, project supplies, & media supplies.

GRADE LEVEL: 9-12 (recommended 9-10)

CREDIT: 0.33

FEES: \$12

LENGTH: Trimester

PREREQUISITE:

*Astronomy II

This class is an advanced exploration of higher level concepts in astronomy. Students will actively explore and

discuss these concepts through research, computer software, internet, field experiences and videos. Fees will be used for observation facility fees, transportation, entrance fees, lab equipment and materials

GRADE LEVEL: 9-12

FEES: \$15

PREREQUISITE: Astronomy

CREDIT: 0.33

LENGTH: Trimester

***Biology Concepts**

Biology Concepts studies biochemistry, cellular structure and function, as well as evolution. These topics include an understanding of organic compounds, photosynthesis and respiration, transport mechanisms, enzyme systems, and changes in species throughout time. Fees will be used for chemicals, indicators and examples of food types.

GRADE LEVEL: 9 (required)

FEES: \$12

PREREQUISITE:

CREDIT: 0.33

LENGTH: Trimester

***Botany**

Botany is the study of the fungi and plant kingdoms. Students will study the structure and function of fungi, algae and the higher green plants. Students will perform a variety of experiments with living plants independently and in groups. Students will use a greenhouse to grow seedling crop plants. Additional activities include planting trees to construct a windbreak. Fees will be used for plant hormones, seeds, consumable chemicals, seedling trees, soil, moss, hand shovels, gloves, and potting materials.

GRADE LEVEL: 9-12

FEES: \$30

PREREQUISITE:

CREDIT: 0.33

LENGTH: Trimester

***Chemistry**

Using the computer to explore this topic will not only give you some computer skills but your perspective on chemistry will be personal to you. You will have the opportunity to explore chemistry the way you learn. This will give you a better understanding of the subject as you truly learn how matter works rather than trying to memorize formulas. Each topic is also orchestrated with many hands-on laboratory activities to make the subject come alive.

GRADE LEVEL: 10-12

FEES: \$24

PREREQUISITE: Algebra I with a "C" or better or Geometry

CREDIT: 1.0

LENGTH: Year

npColorado Geology

This one trimester geologic science course will offer an exploration of Colorado rocks, minerals, fossils, landforms, geologic history and geologic hazards. We will use hands on activities, field work and research to become better acquainted with the geologic wonders of Colorado. This will be an upper level science course available for 10th through 12th grade students. Fees will be used for hands on and field experiences.

GRADE LEVEL: 10-12

FEES: \$20 pending Board approval

PREREQUISITE:

CREDIT: 0.33

LENGTH: Trimester

npColorado Natural Resources

This one trimester science course will offer an exploration of the following Colorado Natural Resources: Forestry, Minerals Resources, Parks and Wildlife as well as Water. We will use hands on activities, media, field work and research to become better acquainted with the natural resources of Colorado. This will be an upper level science course available for 10th through 12th grade students. Fees will be used for hands on and

field experiences.

GRADE LEVEL: 10-12

FEES: \$20 pending Board approval

PREREQUISITE: Ecology

CREDIT: 0.33

LENGTH: Trimester

***Conceptual Physics**

This is a one trimester hands on introductory required course for freshmen. In this course you will use hands on activities and computer programs to analyze the world around you. Using the computer to explore the topic of how the physical world works will not only give you some computer skills but your perspective on science will be personal to you. You will have the opportunity to explore the world around you the way you learn. This will give you a better understanding of the subject as you learn how matter works rather than trying to memorize formulas. Each topic is also orchestrated with many hands-on laboratory activities to make the subject come alive.

GRADE LEVEL: 9 (required)

FEES: \$20

PREREQUISITE:

CREDIT: 0.33

LENGTH: Trimester

***Earth Systems**

This one trimester course will give the student an overview of the dynamic systems which create our Earth. Both the non-living (geologic, hydrologic, atmospheric) and living (biologic) components will be explored utilizing computers, media, labs, and field experiences. Fees will be used for activities/lab supplies and field trips.

GRADE LEVEL: 9 (required)

FEES: \$20

PREREQUISITE:

CREDIT: 0.33

LENGTH: Trimester

***Ecology**

An analysis of the relationships and impact of animals, plants, and humans on ecological systems. Ecological concepts will be related to environmental issues. Students will do many group and independent experiments and projects. All Students will submit an independent research project. Fees will be used for owl pellets, nets, chemicals, ecology kits, live organisms.

GRADE LEVEL: 9-12

FEES: \$12

PREREQUISITE:

CREDIT: 0.33

LENGTH: Trimester

***Engineering 2**

Students who enjoyed Introduction to Engineering will love this class. Students will be using a research base to demonstrate learning of new material that is applicable to any engineering field. Special projects show understanding of the material and how it applies to specific engineering disciplines. The course will use a level of physics tailored to each student as physics applies to almost all engineering disciplines. As students gain an understanding of physics concepts, they will apply these concepts to an engineering project. The projects may start out very simply but can quickly progress to more and more complex projects that will take students as far as the imagination will allow.

GRADE LEVEL: 10-12

FEES: \$48

PREREQUISITE: Introduction to Engineering or Algebra II or higher Math CREDIT: and instructor approval

CREDIT: 1.0

LENGTH: Year

***From Magic to Science**

This course deals with major conceptual revolutions throughout history and the experimental affect upon

society. Students will perform experiments from the Bronze Age through the development of the genetic code. Relevant cross-curricular aspects of culture and society will be stressed to form a context for each scientific milestone. Specific topics will include a survey of life science, Galileo and the Planets, Newton and Physical Theory, and the History of Chemistry. Fees will be used for chemical supplies, craft supplies, and lab ware.

GRADE LEVEL: 11-12

CREDIT: 0.33

FEES: \$30

LENGTH: Trimester

PREREQUISITE:

***Genetics**

Genetics is a study of how DNA is related to cell growth and protein synthesis with implications to life in the future. Inheritance, genetic diseases and disorders, genetic engineering, genetic finger printing, and the genome project will be emphasized. Many independent and group hands-on lab activities and projects are included. Fees will be used for genetic seeds, genetic kits, and materials for models.

GRADE LEVEL: 11-12

CREDIT: 0.33

FEES: \$12

LENGTH: Trimester

PREREQUISITE: Biology Concepts

***Human Anatomy**

Human Anatomy is an introductory course, which emphasizes the relationship between body structure and function as well as a survey of all body systems. The laboratory portion includes microscopic study of tissue and selected dissections. This course is designed for individuals interested in health care and includes 40 hours lecture and 30 hours lab.

GRADE LEVEL: 11-12

CREDIT: 0.66

FEES: \$18

LENGTH: 2 Trimesters

PREREQUISITE: Any Life Sciences Class

***Introduction to Engineering**

What do engineers do and why do they do it? In this course students will be introduced to the principles of electrical and computer engineering in an understandable hands-on way. Students will design and build electrical circuits and digital circuits. These principles and circuits are the basic components in any microprocessor or computer. This is a one-year course that will not only introduce students to these principles but prepare them for Digital System Design, Introduction to Microprocessors, and VLSI System Design at Colorado State University or Associate Degree and Certification Programs at Front Range College. Fees will be used for wires, breadboards, analogue components and digital components of electrical circuitry that students will be able to take home at the end of the course.

GRADE LEVEL: 9-12

CREDIT: 1.0

FEES: \$35

LENGTH: Year

PREREQUISITE:

***Meteorology & Climate**

In our study of ever-changing and exciting weather patterns, we will investigate current weather maps through the use of newspapers, the internet, and television. Climate, past and future, its unique aspects, and its geographical controls will be explored. Each day we will observe conditions and collect data such as temperature, air pressure, precipitation, humidity, clouds, and winds. The students will conduct a wide variety of learning activities to help them understand the "why" and "how" of their environment. Fees will be used for activities-transportation; supplies- weather reporting instruments, project supplies & lab consumables.

GRADE LEVEL: 9-12

CREDIT: 0.33

FEES: \$15

LENGTH: Trimester

PREREQUISITE:

***Microbiology**

Microbiology is a study of bacteria and viruses and their effects on the environment and the body. Students will become proficient in aseptic and staining techniques. Students will design their own experiments and identify an unknown. Many hands-on activities and projects are included. Fees will be used for bacteria cultures, culture media, stains, consumable chemicals and lab ware.

GRADE LEVEL: 11-12

FEES: \$30

PREREQUISITE: Any Biology Class

CREDIT: 0.33

LENGTH: Trimester

***Physics**

Explore the forces of nature and the limits of the universe. Topics include motion, energy, sound, light, and relativity. Hands-on activities are limited only by imagination and initiative. Topics will be explored conceptually and computationally. For students planning on any kind of college technical degree, this class is a must.

GRADE LEVEL: 10-12

FEES: \$40

PREREQUISITE: Previous or concurrent enrollment in Precalculus

CREDIT: 1.0

LENGTH: Year

***Zoology**

Zoology is a study of similarities and differences among animal types. Students will review cell and tissue structure and function. Taxonomy and speciation will also be emphasized. Students will dissect various animals for a comparative perspective. Students will conduct a variety of activities. Fees will be used for live organisms, preserved organisms, kits, and dissecting equipment.

GRADE LEVEL: 9-12

FEES: \$18

PREREQUISITE:

CREDIT: 0.33

LENGTH: Trimester