

# Science Course Descriptions

*Three science credits are required for graduation. Smart Core requires successful completion of 1 unit in Physical Science and Biology, and a lab science of either Chemistry or Physics*

## *Physical Science Classes*

### Physical Science

**Grade Level:** 9-12 - 1 credit, 2 semesters

Physical science begins the study of higher-level physics and chemistry and continues educating the student in the nature of science. In this course students will study the major discoveries such as atoms, the Periodic Table, chemical reactions, gravity, forces, and light waves that have shaped our thinking about the physical world. Students are expected to use suitable mathematics and collect and analyze data. This course serves as a transition into other science courses.

### Chemistry

**Grade Level:** 10, 11, 12 —1 credit, 2 semesters

**Prerequisite:** Successful completion of Physical Science. Prior completion of Algebra II or concurrent enrollment is strongly recommended.

Chemistry studies the structure and composition of matter, and the changes it undergoes. It is an important foundation course for a long list of career fields. Lab work provides an opportunity for familiarization with lab equipment, techniques, and safety procedures. A strong foundation in Algebra is needed and mathematical familiarity with the metric system, significant figures, scientific notation, conversion factors, percentages and ratios are important.

### Pre-AP Chemistry

**Grade Level:** 10--12 – 1 credit, 2 semesters

**Prerequisite:** Successful completion of Physical Science with a minimum of a B average. Follow with enrollment in AP Chemistry.

Pre-AP Chemistry is a more rigorous treatment of the concepts and topics covered in regular Chemistry. Students will be expected to understand and function at higher levels of operation and will be expected to learn more on an individual basis. Materials used will be similar to that of AP Chemistry. The course will emphasize reading, math skills, critical-thinking and problem-solving. The depth of this course requires that additional time be spent outside of class. The laboratory experiments require greater mathematical applications and analysis.

### Physics

**Grade Level 11, 12** - 1 credit, 2 semesters

Prior completion of Algebra II and Trigonometry is highly recommended, but at a minimum, concurrent enrollment in Trigonometry is required. A calculator with trigonometric and scientific functions is mandatory. Physics is a useful foundation course for a variety of career fields and contributes to the understanding of such college courses as chemistry, physics, and engineering. This course deals with the nature of physics and each of its major areas: motion, mechanics, light, sound and electricity. Classroom and laboratory works are fully integrated. 37

## *Life Science Classes*

### Biology

**Grade Level:** 10-12 — 1 credit, 2 semesters

This course is designed as a general survey of the living world, including the study of both plants and animals and their relationship to man. Biology investigates the chemistry and role of cells in life processes, genetics, evolution and the diversity of life. Students will study the world through the study of behavioral relationships, ecology, and the global impact of ecological issues. It continues to educate the student in the nature of science. Students should be expected to spend time viewing and classifying life forms in addition to collecting and analyzing data. This course is an important foundation course of a long list of career fields.

### Pre-AP Biology

**Grade Level: 10 – 1 credit, 2 semesters**

Pre-AP Biology is strongly recommended as preparation for Advanced Placement Biology. Pre-AP Biology is a more rigorous treatment of the concepts and topics covered in regular Biology. Although enrollment is open to all students, those interested in Pre-AP Biology should consider the following criteria: achievement test scores, past performance in science classes, and teacher recommendation. Students will be expected to understand and function at higher levels of operation and will be expected to learn more on an individual basis. Emphasis is on the application of the content material in past, present and future situations with a mathematical approach for recording experimental data and critical evaluation for analyzing, synthesizing, and formulating logical conclusions.

### Zoology

**Grade Level:** 11, 12 — 1/2 credit, 1 semester

**Prerequisite:** Successful completion of Biology with a C or better

This course requires considerable understanding of

biology, as it involves a broad-spectrum survey of the animal kingdom. Students will engage in developing information on selected taxonomy of animals, both invertebrates and vertebrates, with major emphasis on vertebrate systems. A collection of some type will be required.

### **Forensics**

**Grade Level:** 11, 12 - 1/2 credit, 1 semester

Successful completion of Biology and Chemistry is recommended. Forensic Science incorporates scientific processes into the reading, writing, reasoning ability and laboratory competencies used in modern criminal investigations. Students will study the role a forensic scientist plays in analyzing various types of physical evidence, crime scenes, fiber analysis, toxicology, arson, fingerprinting, ballistics evidence, and handwriting and voice analysis. It is a good foundation course for the Law Enforcement pathway found in CAB and HHS.

### **Environmental Science**

**Grade Level:** 11, 12 – 1/2 credit, 1 semester

**Prerequisite:** Successful completion of Biology

This course looks at the natural environment and how it functions from chemical, biological and physical perspectives. In addition, it takes a serious look at current problems within the environment, the solutions that exist and the frustrations involved with making sensible change.

### **Human Anatomy and Physiology**

**Grade Level:** 11, 12 — 1 credit, 2 semesters

A strong foundation in Biology is required with C or better and teacher recommendation. Human Anatomy & Physiology is an integrated approach to the human organism and its functions. Students will study organization of the body and its body systems. Students will develop an understanding of the organization of the human body through studies of body systems, tissues, and the cell and its chemistry. Students will spend time dissecting and viewing body systems as well as collecting and analyzing data. *This course can be taken for concurrent credit from ASU-MH.*

### **Medical Human Anatomy & Physiology HHS (career tech)**

**Grade:** 10, 11, 12—1 credit - 2 semesters

This course focuses on anatomy and physiology of body systems and the diseases of those systems. Specific areas of study include the basic structure of the human body, processes of disease, and the following body systems; integumentary, skeletal, muscular, circulatory, lymphatic, nervous, sensory, respiratory, digestive, urinary, endocrine, and reproductive.

### **Biological Animal Science ACME, HHS (career tech)**

**Grade Level:** 10, 11, 12—1/2 Credit - 1 semester

**Prerequisite:** Successful completion of Animal Science

This course is a scientific approach to animal science using scientific principles and applied management practices. An emphasis on selection and industry review will be based on scientific data.

### **Food Science (career tech)**

**Grade Level:** 11, 12 – 1/2 credit, 1 semester

**Prerequisite:** Successful completion of Food and Nutrition or Nutrition and Wellness, or have taken/ be enrolled in Chemistry.

This course uses the scientific method of study various relationships between food science, nutrition, and food preparation. Experimental methods are employed to analyze food mixtures, food microbiology, food preservations, and complex food systems. Due to the expanding field of food science, students are given insight into career possibilities with the education and training needed, as well as up-to-date information regarding technological advances and future trends in food preparation, preservation, evaluation, and utilization of food

## ***Advanced Placement Courses***

### **AP Environmental Science**

**Grade Level:** 11, 12 — 1 credit, 2 semesters

Strong foundation in Biology and Chemistry (with a B or better) and instructor approval is required. This course deals with advanced concepts in environmental science. Topics covered include, but are not limited to, populations and their affects on the environment, the role of modern civilization on the future of the earth, and various cycles including nitrogen, carbon, water cycles. There will be AP designed laboratory activities to support the many concepts as well as some student generated labs. Students may receive college credit by passing a comprehensive AP exam at the end of the year.

### **AP Biology**

**Grade Level:** 11, 12 — 1 credit, 2 semesters

Strong foundation in Biology (with a B or better) and instructor approval is required. This course consists of the study of molecular and cellular biology, organismal biology and population biology. Students may receive college credit by passing a comprehensive AP exam at the end of the year.

### **AP Chemistry**

**Grade Level:** 12 — 1 credit, 2 semesters

Strong foundation in Physical Science, Biology, Chemistry, and Algebra II as well as instructor recommendation is required. This course deals with advanced concepts in chemistry. Laboratory work and chemical problem solving make up an integral part of this course. Strong math background is necessary. Students may receive college credit by passing a comprehensive AP exam at the end of the year.