

**Department:**

Science

**Graduation Requirements:**

3 credits

**Course Offerings:**

**Biology**      *1 credit*

This first year course is a study of fundamental concepts in biology according to US National Science Standards. Students learn basic concepts about the life-sustaining processes that occur within the cell, the anatomy and physiology of simple cells to complex multicellular organisms, and the ways by which various life forms have adapted to the environment. Genetics, ecology, and animal behavior are also topics of study. The course content is structured to prepare students to have the foundation necessary to be successful when studying higher levels of biology. Interdisciplinary research projects, discussion on recent developments in biology, and a field study are used to encourage students to analyze the scientific, social, political, economic, and ethical issues related to progress in a technological age.

**Biology Honors**      *1 credit*

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Biology Honors is geared towards students who have mostly grades of A's and B's. In this lane, students are expected to display a greater ability to learn independently and only moderate structure is provided by the teacher.

**Physical Science**      *1 credit*

This course is intended for students who would benefit from an extra year of preparation in math and physical science concepts before enrolling in chemistry or physics. Students will gain experience with the basic concepts of chemistry and physics through real-world examples. Critical thinking and problem-solving will be emphasized.

**Chemistry**      *1 credit*

This standard college-preparatory chemistry course is designed for students with average to above-average skills in mathematics and scientific reasoning. It is suited to the needs of students who intend to pursue science or medicine at the college or university level. The class is designed to prepare students to understand the material world around us and develop skills in discovering new knowledge and evaluating new scientific information. The course format will include lecture, discussion, extensive problem-solving, and a full range of laboratory work. Topics covered include properties of matter, chemical reactions, changes in matter and energy, elements

and compounds, stoichiometry, solutions, and gases. Laboratory skills and the mathematical analysis of chemical reactions and data will be emphasized.

**Chemistry Honors**    *1 credit*

This advanced chemistry class is a sequel to Honors Biology. Topics are similar to General Chemistry, but with greater mathematical rigor. Rigorous analysis of data and organized data gatherings skills are cultivated; students will learn how prepare formal lab procedures and write-ups. This course also covers safety in the lab, exploration and cultivation of analytical skills, and problem solving techniques: dimensional analysis, calculators, algebra and algorithms. Some exponential decay math is introduced. Topics include stoichiometry, concentration, gas laws, types of reactions, orbitals, nuclear chemistry, bonds, periodic trends, basic biochemistry, equilibrium, reaction rates and kinetics, ions and precipitation, electrochemistry, and basic organic chemistry.

**Advanced Placement Chemistry**    *1 credit*

A college level chemistry course focusing on topics such as: thermodynamics, thermochemistry, physical behavior of gases, states and structure of matter, chemical equilibrium and kinetics, and various chemical reactions. Laboratories will be based on the recommendations of the College Board. Emphasis will be on developing advanced inquiry and reasoning skills, such as designing a plan for collecting data, analyzing data, applying mathematical routines, and connecting concepts across all fields of science.

**Physics**            *1 credit*

This basic course is a sequel to chemistry. It is designed to explore, develop, and apply the conceptual learning process within various topics of physics. It is intended to further develop organizational and study skills that support the acquisition of new scientific and laboratory skills, as well as to assist students in developing self-confidence in themselves and their abilities. Topics include concepts in mechanics, properties of matter, heat, sound/light, electricity/magnetism, and atomic/nuclear physics. Students will learn about scientific methods and strategies and learn how to reason and communicate about topics in the physical world. Some basic algebraic skills are required for this class.

**Physics Honors**            *1 credit*

This advanced physics course is a sequel to Honors Chemistry. The course is designed to explore, develop, and apply the conceptual learning process within various topics of physics. It is intended to further develop organizational and study skills that support the acquisition of new scientific and laboratory skills, as well as to assist students in developing self-confidence in themselves and their abilities. Rigorous data collection and analysis skills are developed; formal lab procedures and write-ups will be required. Topics include concepts in mechanics, properties of matter, heat, sound/light, electricity/magnetism, and atomic/nuclear physics. Students will learn about scientific methods and strategies and learn how to reason and communicate about topics in the physical world. This is a math-based physics course, so algebraic and geometric skills are required

**Advanced Placement Physics**      *1 credit*

AP Physics is a college level course providing an introduction to the main principles of physics and emphasizing the development of problem- solving ability. Formal lab procedures and writing skills are necessary in this course; laboratory technique will be developed throughout the year. The course will cover Newtonian and fluid mechanics, electricity and magnetism, waves and optics, and thermal, atomic and nuclear physics. Completion of one year of Honors Physics is highly recommended. Knowledge of algebra and basic trigonometry is required for this course.

**Anatomy & Physiology Honors**      *1 elective credit*

This course is designed to help students develop a solid, basic understanding of the concepts of anatomy and physiology. During the course of the year, a survey of the structures and functions of the major body systems will be presented. Students will also be asked to research real life situations related to each system. Laboratory study is included in this course. Normally this course is offered to seniors and juniors with preference given to seniors.

**Robotics**      *1 elective credit*

This full year course in robotics will begin with the history of robots and a brief discussion of their future. This course prepares students to participate in the FIRST Robotics Competition. Students will also be required to participate in FRC Hawaii regional which will take place possibly on a non-school day to be determined, additional sessions may be added if the demand warrants. There will be individual, partner and team projects. Each student is expected to participate fully with their partners for all projects. Skills and knowledge acquired in this class include: 1. Machine tools and Safety, 2. Motors and Actuators, 3. Electrical systems and wiring, 5. Pneumatics, 6. Computer Programming, 7. Designing a business plan, and 8. Design and construction of a robot.

**Rocketry**      *1/2 elective credit*

This is a one-semester course covering the history, uses, and principles of rocketry. This course teaches students the basic concepts required for propulsion, guidance, and ground safety protocols. Additionally, the future of space colonization and exploration, along with current topics in planetary exploration, extraterrestrial life, and the politics of space, will be discussed. Each student will build and fly a rocket, as well as make a presentation to the class.

*Prerequisites: \$20 lab fee*

**Astronomy**      *1/2 elective credit*

Astronomy is an introductory course in a physical science pertaining to the study of everything above and beyond the Earth's atmosphere. The basic concepts of physics and chemistry will be covered while trying to build a basic understanding of the various forms of matter within our Universe. The study of planets, stars, exotic remnants, galactic structure, and cosmological outcomes are among the many topics that will be covered.

**Aquaculture**      *1/2 elective credit*

Aquaculture is the farming of aquatic organisms in natural or controlled marine or freshwater environments. Students enrolled in the Aquaculture course will be introduced to the life cycle of selected species of fish and procedures to enhance the propagation and growth of the species. Students will actively participate in hands on activities designed to monitor growth and prevent

disease. Students will incorporate Biology concepts such as Anatomy and Physiology of the fish, Chemistry concepts such as pH and dissolved oxygen and environmental concepts including the maintenance of an aquatic environment. Students will also explore careers related to the science of Aquaculture.

**Organic Chemistry** *1 elective credit*

This course includes the study of the most important groups of carbon-containing compounds (alcohols, alkyl halides, acids, amines, amides, aldehydes, ketones, aromatic compounds, and others) is undertaken. This study covers their structure, nomenclature, preparation, and reactions. The uses and biological applications of the most important organic compounds are discussed.