

SCIENCE



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BIOLOGY [9]

BIO

CREDITS: 1.0

PREREQUISITE: None

This one year laboratory science course focuses on the study of life by examining five fundamental concepts: basic organic chemistry, biochemistry, an in-depth study of cellular biology, foundations of genetics, and a survey of animal diversity. Critical science and study skills are developed and practiced in every unit. Weekly hands-on labs and activities reinforce data interpretation based on claim/evidence reasoning. The science inquiry method incorporated allows all students the opportunity to build their own knowledge base.

HONORS BIOLOGY [9]

H BIO

CREDITS: 1.0

PREREQUISITE: Placement Test

Honors Biology is a more rigorous, inquiry-based course that explores the fundamental principles of life through hands-on activities, data analysis, and scientific reasoning. Students will engage in experimentation where they will learn to develop models, analyze evidence, and apply their knowledge to real-world biological issues. Key concepts include evolution, chemistry of life, cells, and genetics. The course emphasizes critical thinking, collaboration, and problem-solving, building a strong foundation in biological principles and skills to think and work like a scientist.

PHYSICAL SCIENCE (10)

PHYS SCI

CREDITS: 1.0

PREREQUISITE: Biology

The course delves into the fundamental principles of physics and chemistry, igniting curiosity and a deeper understanding of the physical universe around us. Through a blend of hands-on experiments and activities, students collaborate to develop an understanding of key topics, such as motion, forces, energy transformations, matter and its properties, atomic structure, bonding, chemical reactions, and gas laws. A conceptual understanding of the science principles is emphasized in this course.

CHEMISTRY (10)

CHEMISTRY

CREDITS: 1.0

PREREQUISITE: Biology

This course explores the relationship between matter and energy. Key concepts for investigation include atomic structure, matter and its properties, chemical bonding, types of chemical reactions, stoichiometry, heat transfer, kinetic molecular theory of gases, and gas laws. Hands-on labs and activities carried out during the unit will reinforce conceptual understanding and provide areas for further discussion of real world application. Strong organization and problem solving strategies will be taught throughout the course.

HONORS CHEMISTRY (10)

H CHEM

CREDITS: 1.0

PREREQUISITE: Honors Biology OR Permission by Honors Chemistry Teacher

This course lays the foundation for basic chemistry concepts needed to be successful in AP Chemistry. It begins with dimensional analysis and problem solving strategies that are tedious to students because they are ready to blow something up. After lab safety and lab protocols are reviewed, students enjoy many hands-on activities and labs that reinforce critical thinking skills. Time is dedicated to teaching students how to analyze data and improve written communication through claim-evidence-reasoning logic. Collaborative work focuses on peer tutoring with instructor input as needed. Problem solving strategies are taught by working simple free-response questions and allowing students to grade their own papers using a rubric. Other test taking strategies are reviewed for multiple choice question types and help students identify and complete easier problems first for improved time management skills. Topics covered include atomic structure, matter and its properties, stoichiometry, chemical reactions, thermochemistry, bonding, intermolecular forces, Lewis structures, and acids and bases.

ADVANCED PLACEMENT (AP) CHEMISTRY (11,12)

AP CHEM

CREDITS: 1.0

PREREQUISITE: Completion of Honors Chemistry OR Permission from AP Chemistry Teacher

This course is the equivalent of General Chemistry I and II at the University level. Student learning is catalyzed through collaborative activities and hands-on laboratory experiments. Data analysis skills are introduced through these activities. Written communication is modeled and peer reviewed to assist students in claim-evidence-reasoning scientific reporting. Collaboratively, students work topic specific AP free-response questions to improve clear, concise written communication skills. Students grade their own work using AP scoring rubric to help them identify strengths and weaknesses in their understanding. This method also highlights ways to approach problem solving that will better represent what they know versus what they think they know. Topics of interest include atomic structure, matter and its properties, chemical reactions, kinetics, thermochemistry, equilibrium, acids and bases, thermodynamics, and electrochemistry. By the end of the course students are more proficient scientific writers and communicators as well as problem solvers.

ENVIRONMENTAL SCIENCE (11,12)

ENV SCI

CREDITS: 1.0

PREREQUISITE: Biology

In this dynamic and hands-on course, students will delve into the principles of environmental science, focusing on the intersection of human activity and the natural world. Through a variety of engaging activities and projects, students will examine key environmental issues, explore solutions, and build a deeper understanding of sustainability. Throughout the course, students will develop problem-solving skills, participate in group discussions, and complete projects that encourage creative solutions to environmental challenges.

AP ENVIRONMENTAL SCIENCE (11,12)

AP ENV SCI

CREDITS: 1.0

PREREQUISITE: H Biology, H Chemistry, or Recommendation of Instructor

The goal of the AP Environmental Science course is to provide students with the scientific principles, concepts, and methodologies that are required for them to understand the interrelationships of the natural world. The course helps students to identify and analyze environmental problems both natural and human-induced, to assess the relative risks associated with these problems, and to evaluate alternative solutions for resolving or preventing them. The scientific process is heavily emphasized in this course, and students should expect to use class time, both on and off campus, to complete laboratory and fieldwork investigations. This course is interdisciplinary and embraces a wide variety of topics from different areas of study, including biology, geography, chemistry, economics, political science, and ethics.

FORENSICS SCIENCE (12)

FOR SCI

CREDITS: 1.0

PREREQUISITE: Chemistry or 80% or higher in Physical Science

This exciting and investigative course introduces students to the world of forensic science, where science meets criminal justice. Students will learn how scientific principles are applied to solve crimes, analyze evidence, and determine what happened at a crime scene. Specific topics include crime scene investigation, DNA analysis, blood splatter patterns, entomology, chemical analysis of evidence, anthropological aspects, fingerprinting, ballistics, case studies, and mock trials. Throughout the course, students will sharpen their critical thinking and problem-solving skills while learning how forensic science is used in the criminal justice system. By the end of the class, students will gain a deep appreciation for how forensic experts work to uncover the truth and bring justice to those affected by crime.

HUMAN ANATOMY AND PHYSIOLOGY (11,12)

ANAT/PHYSIO

CREDITS: 1.0

PREREQUISITE: Biology

This course presents a basic knowledge about the structure and function of cells, organs, and organ systems necessary to understand how the human body is maintained. Students will use evidence-based reasoning in laboratory and case study work to support classroom concepts and to extend theory into practical application. Dissections are required and include dissection of preserved specimens, use of microscopes for histological study, and physical activities that demonstrate the workings of the human body.

ADVANCED PLACEMENT (AP) BIOLOGY (11,12)

AP BIO

CREDITS: 1.0

PREREQUISITE: Final grade of A or B in Biology or AP Science

AP Biology is an introductory college-level biology course. Students cultivate their understanding of biology through inquiry-based investigations as they explore the following topics: evolution, cellular processes, energy and communication, genetics, information transfer, ecology, and interactions. Hands-on activities and labs that provide students an opportunity for collaboration and biological problem solving constitute 25 percent of the instructional time in the course. Laboratory explorations include but are not limited to cellular respiration, photosynthesis, diffusion and osmosis, DNA sequencing, genetics, and animal behavior.

EARTH AND SPACE SCIENCE (11,12)

EARTH/SPACE

CREDITS: 1.0

PREREQUISITE: Biology or Physical Science

This course is project based and offers high school students an opportunity to communicate about more in-depth phenomena central to the earth and space sciences. To help students answer the question, “What is the Universe, and what is Earth’s place in it?” students explore the universe and its stars using current events. Students learn communication skills that allow them to have meaningful class discussions and formulate projects for group presentations. Current events centered around what is happening in the world that affects Earth, its population, or the solar system help generate case studies for class discussions and presentations. Some time is spent on the history of planet Earth and its materials and systems, plate tectonics and large-scale system interactions. As the role of water becomes increasingly relevant today, these processes as well as weather and climate are explored.

ADVANCED PHYSICS (11,12)

ADV PHYSICS

CREDITS: 1.0

PREREQUISITE: Math - Concurrent with Algebra II; Recommendation of Physics Instructor

This course is Algebra-based physics. The goal is to enliven student curiosity about their world and matter's interactions with it. Topics include distance, velocity and acceleration, Newton's laws of motion, momentum and collisions, work and energy, rotational motion and gravity, simple harmonic motion, and fluids. Students gain experience designing experiments and performing calculations to determine the acceleration due to gravity, velocity of moving objects, frictional forces, centripetal acceleration, spring constants, center of mass, work and kinetic energy, and torque. This course will stress a conceptual understanding of everyday phenomena in terms of underlying physical principles. Data interpretation and graphing skills are taught during the course. All formulas are provided for assessments.

ADVANCED PLACEMENT (AP) PHYSICS (11,12)

AP PHYS 1

CREDITS: 1.0

PREREQUISITE: Math- Concurrent with Pre-Calculus, Recommendation of AP Physics Instructor

AP Physics 1 is designed to prepare students to take the AP Physics 1 examination. This course emphasizes problem solving in the context of the principles of physical laws and principles. Students will be involved in problem solving, inquiry-based laboratory activities on an individual, small group and large group basis. Through this process the ability to read and understand problems, break them down into their component parts and then create and present solutions will be developed. Topics covered include kinematics, linear dynamics, circular motion, work, energy and power, oscillations, torque and rotational motion, and fluids. At least 25% of instructional time is devoted to experimental design and inquiry activities to aid first year physics students in their conceptual understanding of physics principles. Use of lab software and probeware will be utilized for student analysis of data.

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