SCIENCE

"D" Requirement: Two years of Integrated Science (Integrated Science I and II) are required for UC/CSU beginning with the class of 2021. Two years of Laboratory Science (1 year of Life Science and 1 year of Physical Science) are required for UC/CSU.

53001 Integrated Science I

UC/CSU approved course. Meets Laboratory Science Requirement.

Grades: 9 -12 Credits: 10 (year-long course) UC/CSU: (fulfills D requirement) Prerequisite: None

Integrated Science I emphasizes how Earth is a unique system that supports life. Earth's biotic and abiotic systems are defined by the interaction of matter and energy through dynamic processes. These processes impact the biosphere over time. The standards in Integrated Science I present the foundations of physics, chemistry, biology, and Earth science. These standards build the knowledge base that prepares the student for the next three years of integrated science where the rest of the California Science Standards will be addressed. The Integrated Science I concepts will be further enhanced by having students perform careful scientific investigations.

53002 Integrated Science II

UC/CSU approved course. Meets Laboratory Science Requirement.

Grades: 9 -12 Credits: 10 (year-long course) UC/CSU: (fulfills D requirement) Prerequisite: Completion of Integrated Science I or course equivalent

Integrated Science II overarching concept is that the Earth is a unique system that supports life within an ever-changing and complex universe. Building upon the standards covered in Integrated Science 1, this theme includes standards taken from physics, chemistry, biology, and Earth science. In chemistry, the standards pertain to solutions, chemical reactions, and organic chemistry. The biology standards include considerations of molecules, cells, protein synthesis, cell reproduction, and Mendelian genetics. Earth science standards pertain to planetary motion, solar radiation, energy transformations at the Earth's surface, and geological and climatic changes. The Integrated Science II concepts will be further enhanced by having students perform careful scientific investigations.

53003 Integrated Science III

UC/CSU approved course. Meets Laboratory Science Requirement.

Grades: 9 -12 Credits: 10 (year-long course) UC/CSU: (fulfills D requirement) Prerequisite: Completion of Integrated Science II or Biology/Physics and Integrated Math I

Integrated Science III overarching theme is that the Earth changes over time. These changes are

inherently interrelated in a cause-and-effect fashion with changes in both abiotic and biotic systems. Year three continues to build upon the standards studied in Integrated Science I and II, including standards from physics, chemistry, biology, and Earth science. The physics standards studied in the third year pertain to motion and forces, conservation of energy and momentum, electric and magnetic phenomena, including the standards pertaining to energy and Newton's Laws. The chemistry standards include conservation of matter and stoichiometry, gases and their properties, acids and bases, solutions and reaction rates, and chemical equilibrium. The biology standards include cell biology, genetics, and evolution. The Earth science standards, which relate to the study of the Earth's atmosphere, provide the foundations upon which each of the foregoing scientific disciplines will be taught. The Integrated Science III concepts will be further enhanced by having students perform careful scientific investigations.

53125 Pre - Advanced Placement Biology

UC/CSU approved course. Meets Laboratory Science or G-Elective requirement.

Grades: 9-10 Credits: 10 (year-long course and weighted) UC/CSU: ☐ (fulfills D or G requirement)

Prerequisite: Completed or concurrently enrolled in Math I and with recommendation only.

The Pre-AP Biology course emphasizes the integration of content with science practices—powerful reasoning tools that support students in analyzing the natural world around them. This ability is one of the hallmarks of scientific literacy, and it cultivates a more sustainable pathway to numerous college and career opportunities in science as well as numerous natural and social sciences. This course focuses deeply on the foundational biology knowledge and skills that matter most in preparing students for subsequent coursework in science. This course concentrates on the core areas of ecological systems, evolution, cellular systems, and genetics. Rather than understanding content topics in isolation, students will make meaningful connections between the structures, processes, and interactions that exist across biological systems—from cells to ecological communities.

53150 Advanced Placement Biology

UC/CSU approved course. Meets Laboratory Science or G-Elective requirement.

Grades: 11-12 Credits: 10 (year-long course and weighted) UC/CSU: ☐ (fulfills D or G requirement)

Prerequisite: Grade of C or higher in both Biology and Chemistry or with recommendation.

This course meets the UC requirements for laboratory science. AP biology is a rigorous biology class. It is similar in scope to the first- year general college biology class. Students will participate in lab, projects, field trips and discussion- based lectures. Student is required to take the AP Exam in May.

53200 Chemistry

UC/CSU approved course. Meets Laboratory Science or G-Elective requirement.

Grades: 10 -12 Credits:10 (year-long) UC/CSU: ☐ (fulfills D or G requirement) Prerequisite: Grade of C or higher in Biology and Integrated Math I.

This course meets the UC requirements for laboratory science. Chemistry is the science that deals with

the materials of the universe and the changes that these materials undergo. We will study the elements, the compounds they form, and the laws governing their properties and interactions. We will also discuss the importance of chemistry in our modern society. This is a lab science designed for students taking an academic program in preparation for college.

53250 Advanced Placement Chemistry

UC/CSU approved course. Meets Laboratory Science or G-Elective requirement).

Grades: 11-12 Credits: 10 (year-long course and weighted) UC/CSU: ☐ (fulfills D or G requirement)
Prerequisites: B or higher in Chemistry, Pre-AP Biology, or Integrated Math II (Integrated Math II can be concurrent enrollment for AP Chemistry)

AP Chemistry is designed to be the equivalent of a first-year college general chemistry course and follows the College Board's AP Chemistry Topic Outline. As such, the course is suitable only for high school students who exhibit high levels of commitment, motivation and academic maturity. This course presents a rigorous treatment of the following concepts: the nature of matter, gas laws, thermodynamics, stoichiometry, bonding, chemical kinetics, chemical equilibria, and organic nomenclature. This course requires the *successful completion* of General Chemistry and Algebra II. Students are expected to be motivated and spend extra time studying outside of class. The problem-solving strategies obtained during this course will prepare college-bound students for careers in the sciences, medicine, and other technical areas. Student is required to take the AP Exam in May.

53300 Physics

UC/CSU approved course. Meets Laboratory Science or G-Elective Requirement.

Grades: 9 -12 Credits: 10 (year-long course) UC/CSU: ☐ (fulfills D or G requirement)
Prerequisites: Grade of C or higher in Integrated Math I

Physics takes a concept before calculation approach to learning Physics. Students study a variety of topics that will help them explain the workings of the physical universe. Students will study energy as it is applied to motion, gravity, electricity, heat, fluids, light, waves, and sound. Many real world applications of physics are brought into the classroom. Calculations will be required for each unit.

57047 Physics and Engineering

UC/CSU approved course. Meets Laboratory Science or G-Elective Requirement.

Grades: 11 -12 Credits: 10 (year-long course) UC/CSU: ☐ (fulfills D or G requirement)
Prerequisites: Grade of C or higher in Integrated Science II and Integrated Math I

In Physics and Engineering: Motion by Design students apply principles of physics and engineering to an iterative cycle of product design. In this year-long, integrated, college-preparatory course, students will develop an understanding of fundamental physics concepts in kinematics, mechanics, mechanical and electromagnetic waves, and electricity/electromagnetism while exploring robotics, computer programming, computer aided design (CAD) and rapid product development. Working individually and in teams, students complete a series of design challenges to develop key skills in computer programming, 3-D modeling software, engineering technology, and physics concepts. The course culminates with competition-ready, semi-autonomous devices presented as marketable

products designed to serve a specific purpose in the local community. These projects promote critical thinking, communication, collaboration, creativity and provide a foundation for data collection, analysis, reflection, presentations and technical writing skills. By successfully completing the course, students will be prepared for success in college science and engineering as well as in high-demand careers like automation and advanced manufacturing.

53400 Human Anatomy

UC/CSU approved course. Meets Laboratory Science Requirement.

Grades: 11-12 Credits: 10 (year-long course) UC/CSU: ☐ (fulfills D or G requirement) Prerequisites: Completion of Biology or Integrated Science I

This course will teach the structure and function systems of the human body. Laboratory activities include the study of human anatomy and models, measurements of physiological processes. Appropriate for majors in medical careers such as medical assisting, certified nurse assistant, psychology, social service, art, and other paramedical and health occupations. Students receive science credit, which is helpful towards their Health Career Pathway.

53600 Environmental Science

Pending UC/CSU approved course. Meets Laboratory Science or G-Electives requirement

Grades: 10-12 Credits 10 (year-long course) UC/CSU: ☐ (fulfills D or G requirement) Prerequisite: Grade of C or higher in three years of Science or with a recommendation.

Environmental issues are in the news every day, and it is more important than ever to understand the science behind the stories. This course will help students understand the key contemporary issues facing our planet. Students will develop the ability to evaluate the evidence being used in these debates, to be able to formulate and express their own viewpoint, and to work together in problem solving. This course has been developed to be a rigorous laboratory science course that stresses scientific principles, processes and analysis, while also providing opportunities to explore the many social, political, economic and ethical issues that are relevant to the environmental topics studied. Environmental science integrates many disciplines of inquiry, and invites students to be creative in formulating hypotheses for their studies.

53650 Advanced Placement Environmental Science

UC/CSU approved course. Meets Life Science or G-Elective Requirement.

Grades: 11-12 Credits: 10 (year-long course and weighted) UC/CSU: ☐ (fulfills D or G requirement) Prerequisites: Grade of “C” or higher in Biology and Chemistry/Physics or in Integrated Science I and Integrated Science II or with a recommendation.

This course meets the UC requirement for laboratory science. AP Environmental Science is an introductory science course, which incorporates biology, chemistry, physics and sociology. This course will help the student understand how the natural world works and how the environment is used by society. This class will also focus on what we can do to protect and improve our environment, for ourselves and other living things. Student is required to take the AP Exam in May.

53700 Natural Resource and Habitat Management (SEA Pathway) UC/CSU approved course. Meets Laboratory Science or G-Electives requirement

Grades: 11 Credits 10 (year-long course) UC/CSU: ☐ (fulfills D or G requirement)
Prerequisite: Grade of C or higher in Integrated Science I and II or Biology and Physics.
Note: Student must also be concurrently enrolled in Power of Language and US History/Natural Resource courses. Natural Resource and Habitat Management through Integrated Science is a third-year college preparatory laboratory science course that integrates Next Generation Science Standards with the CTE Environmental and Agricultural Careers Pathway. This integrated class combines an interdisciplinary approach to laboratory science and research with managing sustainable environmental principles. Using skills and principles learned in the course, including the chemical and biological principles that govern land management and watershed preservation, students conduct experiments for sustainable practices, research and learn the tools of the field, observe natural resources in the community, and learn how to evaluate and mitigate or manage the impact human activity. Connections to practices and experts in the field provide an opportunity to explore a variety of potential jobs available in the industry.

Advanced Placement Computer Science Principles

Pending UC/CSU approval.

Grades: 9-12 Credits: 10 (year-long course) UC/CSU: ☐ (fulfills D requirement) Prerequisite: Successful completion of Math 1 or concurrent enrollment in Math 1 with strong math skills. Recommended Co-Requisite: It is recommended that students be concurrently enrolled in Math 2 or Math 2 Honors or higher.

The AP Computer Science Principles course is designed to be equivalent to a first-semester introductory college computing course. In this course, students will develop computational thinking skills vital for success across all disciplines, such as using computational tools to analyze and study data and working with large data sets to analyze, visualize, and draw conclusions from trends. The course engages students in the creative aspects of the field by allowing them to develop computational artifacts based on their interests. Students will also develop effective communication and collaboration skills by working individually and collaboratively to solve problems, and will discuss and write about the impacts these solutions could have on their community, society, and the world.