



Science Course Offerings 2021-2022

All Science Courses are yearlong (semesters A/B) for 10 credits

Graduation requirements require 10 credits in a **physical science course** and 10 credits in a **life science course**.

Non-highlighted courses qualify as either life or physical science courses.

Course and Description	Prerequisites or Co-requisites	Homework Load	9 th	10 th	11 th	12
Physical Science (S 10A/B) <ul style="list-style-type: none"> • Lab-based, inquiry-oriented course involving principles and concepts concerning the physical world. (Literacy based) • Nature and behavior of matter, atomic theory, chemical and physical changes including bonding and reactions, mechanics, electricity and magnetism, light and sound, and energy. • Proper use of fundamental science tools including the metric system, periodic table, and graphing. 	Algebra 1 (At least 6th grade reading level)	0-20 minutes per week; all work can be finished in class. If not, it is assigned as homework	X			
Advanced Physical Science (S 20A/B) weighted GPA <ul style="list-style-type: none"> • Goes beyond the curriculum expectations of a standard physical science course offering by increasing the depth and complexity. • Students are engaged in dynamic, high-level learning. • The pace of an advanced course may be faster than that of a “standard” course. 	Algebra 1	0-60 minutes per week;, finishing lab questions, studying for quizzes and tests, and worksheets.	X			

Course and Description	Prerequisites or Co-requisites	Homework Load	9 th	10 th	11 th	12
<p>Biology (S 31A/B)</p> <ul style="list-style-type: none"> Students will explore relationships between structure and function in organisms and the interaction of cells and organisms with each other and their environments. Topics: use of a microscope, cell structure and function, biochemistry, microbiology, classification, human physiology, genetics, evolution, and ecology. Laboratory activities reinforce concepts presented and engage students in the practices of scientific inquiry. 	<p>Not available to 9th grade students</p> <p>Physical Science and Geometry</p>	<p>0-20 minutes per week; Finishing vocabulary, an assignment, or a lab that was not finished during regular class time; preparing for a quiz or</p>		X		
<p>Advanced Biology (S 37A/B) weighted GPA</p> <ul style="list-style-type: none"> Goes beyond the curriculum expectations of a standard biology course offering by increasing the depth and complexity. Students are engaged in dynamic, high-level learning. The pace of an advanced course may be faster than that of a “standard” course. 	<p>Geometry or Advanced Geometry or Advanced Algebra 2</p>	<p>1-2 hours per week; Readings, complete lab reports, practice study guides and tests</p>	X	X		
<p>Advanced Chemistry (S 51A/B) weighted GPA</p> <ul style="list-style-type: none"> Provides the opportunity to develop knowledge and understanding about the relationships between the structure and properties of matter and the interaction of matter and energy. Topics: matter and its changes, atomic structure, chemical composition, nomenclature, acids and bases, reactions, stoichiometry, gas laws, periodicity, bonding, molecular geometry, and thermochemistry. Laboratory activities reinforce concepts presented in the course. As an advanced course, this course goes beyond the curriculum expectations of a standard course offering by increasing the depth and complexity. Students are engaged in dynamic, high-level learning. 	<p>Advanced Algebra 2 or Algebra 2 or higher level math classes</p> <p>AND</p> <p>Biology or Advanced Biology</p>	<p>10-20 minutes per night; Students will be watching instructional lecture videos and taking notes, completing prelab questions, finishing labs, studying for quizzes and tests, or working on a semester project.</p>		X	X	X

Course and Description	Prerequisites or Co-requisites	Homework Load	9 th	10 th	11 th	12
<p>Advanced Physics (S 63A/B) weighted GPA</p> <ul style="list-style-type: none"> • Topics: measurement, light, waves, motion, forces, energy, electricity, magnetism, and atomic physics. • Laboratory work serves to promote understanding and to illustrate the experimental nature of physics. • As an advanced course, this course goes beyond the curriculum expectations of a standard course offering by increasing the depth and complexity. • Students are engaged in dynamic, high-level learning. 	Advanced Precalculus or Precalculus	~30 minutes per night (will vary depending on the night though); Lab reports, textbook problems, online quizzes		X	X	X
<p>Marine Biology (S 36A/B)</p> <ul style="list-style-type: none"> • Topics: Physical structure and chemistry of the ocean, the diversity of ocean life, marine ecology, and the scope and impact of human interactions with the oceans. • Laboratory activities reinforce concepts presented. • Students will be assessed in a variety of formats, which may include tests, performance assessments, evaluation of laboratory skills, and the demonstration of critical thinking. 		0-20 min per week; Worksheets, study guides		X	X	X
<p>Earth and Space Science (S 16 A/B)</p> <ul style="list-style-type: none"> • Provides the opportunity to develop knowledge and understanding about the relationships between the structure, processes, and resources in the Universe and on Earth. • Emphasis is placed on laboratory and field experiences. • Topics: First Semester: The mechanics of the night sky, Light and the Electromagnetic Spectrum, Telescopes, the Solar System, Stars, Galaxies and Cosmology. Second Semester: Minerals and Rocks, Plate Tectonics, Climate Processes, Resources and the Environment, Physical and Chemical Changes in the Geosphere, and Natural Hazards. • This course is inquiry based and involves both independent and cooperative learning. 		0-20 minutes per week; Finishing in class work, finishing projects, previewing content.			X	X

Course and Description	Prerequisites or Co-requisites	Homework Load	9 th	10 th	11 th	12
Biotechnology (S 41 A/B) <ul style="list-style-type: none"> • Topics: History of biotechnology, genetics, pathogens and outbreaks, cancer research, genome editing and CRISPR, vaccine and drug development, biowarfare, agriculture, energy solutions, forensics, biomedical and bioengineering • Gain practical lab skills • Talks in class from visiting industry professionals 	Prereq: Biology or Advanced Biology	0-20 min per week; Occasional readings, finishing projects		X	X	X
AP Environmental Science (S 69A/B) weighted GPA <ul style="list-style-type: none"> • Builds understanding of scientific processes and concepts and prepares high school students to develop solutions to current and future environmental problems. • Project-based course that blends together life sciences and physical sciences and allows students the opportunity to connect what they are learning to real-world issues and problems. 	Biology	Will vary; 1 lab per week, 30 min reading; Lab reports, readings, discussion boards; possible field trips		X	X	X
Advanced Anatomy and Physiology (S 52A/B) weighted GPA <ul style="list-style-type: none"> • Provides students an opportunity to explore the structure and function of the human body. • The focus of this course will be to emphasize the physiological aspects of each of the 11 major body systems with in-depth exploration of histology, biochemistry, cytology, and pathophysiology as related to both structure and function. • Class work will include lecture, lab, group discussion, independent thinking assignments, clinical scenarios, and dissection. • As an advanced course, this course goes beyond the curriculum expectations of a standard course offering by increasing the depth and complexity. 	Biology or Advanced Biology	20 minutes (but there is no nightly homework. Weekly, they should be putting in 1:20); Completing reading guides, lab reports, studying for quizzes and tests; All class websites are based in Schoology and a personal computing device is necessary to access the electronic materials.		X	X	X

<ul style="list-style-type: none"> Students are engaged in dynamic, high-level learning. The pace of an advanced course may be faster than that of a “standard” course. 						
Course and Description	Prerequisites or Co-requisites	Homework Load	9th	10th	11th	12
<p>CU Succeed AP Biology (S 68A/B) weighted GPA</p> <ul style="list-style-type: none"> 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. 	Advanced Biology Advanced Chemistry	Will vary; 1 lab per week, 30 min reading; Lab reports, readings, discussion boards; everything is on schoology 1-2 hours per week		X	X	X
<p>CU Succeed AP Chemistry (S 66A/B) weighted GPA</p> <ul style="list-style-type: none"> AP Chemistry is an introductory, college-level chemistry course. Students cultivate their understanding of chemistry through inquiry-based investigations, as they explore topics such as: atomic structure, intermolecular forces and bonding, chemical reactions, kinetics, thermodynamics, and equilibrium. 	Advanced Chemistry	Will vary. About 15-30 min per night; formal lab reports - 45 min weekly; Chemistry problems, AP practice problems, review worksheets, formal lab reports, studying for quizzes and tests			X	X
<p>CU Succeed AP Physics (S 70A/B) weighted GPA</p> <ul style="list-style-type: none"> AP Physics C combines two courses -- AP Physics C: Electricity and Magnetism and AP Physics C: Mechanics. AP Physics C: Electricity and Magnetism is a one-semester, calculus-based, college-level physics course, especially appropriate for students planning to specialize or major in physical science or engineering. The course explores topics such as electrostatics; conductors, capacitors, and dielectrics; electric circuits; magnetic fields; and electromagnetism. AP Physics C: Mechanics is equivalent to a one-semester, calculus-based, college-level physics course, especially appropriate for students planning to specialize or major in physical science or engineering. The course explores topics such as kinematics; Newton’s laws of motion; work, energy and power; systems of particles and linear momentum; circular motion and rotation; and oscillations and gravitation. Introductory differential and integral calculus is used throughout the course. 	Calculus AB or Calculus BC	~45 minutes per night (will vary depending on the night though); Lab reports, textbook problems, online quizzes			X	X

Course and Description	Prerequisites or Co-requisites	Homework Load	9 th	10 th	11 th	12
<p>Science Research Seminar (S 98A/B) weighed GPA</p> <ul style="list-style-type: none"> • This highly structured year-long course offers students of an opportunity to perform authentic science research of their own choosing. • Students participate in the community of scientific research and scholarship as part of their high school experience by performing hands-on scientific research under the supervision of a qualified mentor. • Students identify their own topic of research; read relevant and appropriate scientific literature; create testable hypotheses; and design, analyze and discuss results. • Each student will have the opportunity to enter research into local, state and national competitions, write a publication-quality paper describing research results, and give an oral presentation of research results. 	<p>Strongly recommended: Physics or Statistics or Engineering or Computer Programming</p>	<p>20-60 minutes per week outside of class time, depending on time of year; Reading primary sources, meetings with mentor, creating posters and presentations, doing online discussions, writing papers; Science Fair and SRS Symposium are REQUIRED event</p>			X	X