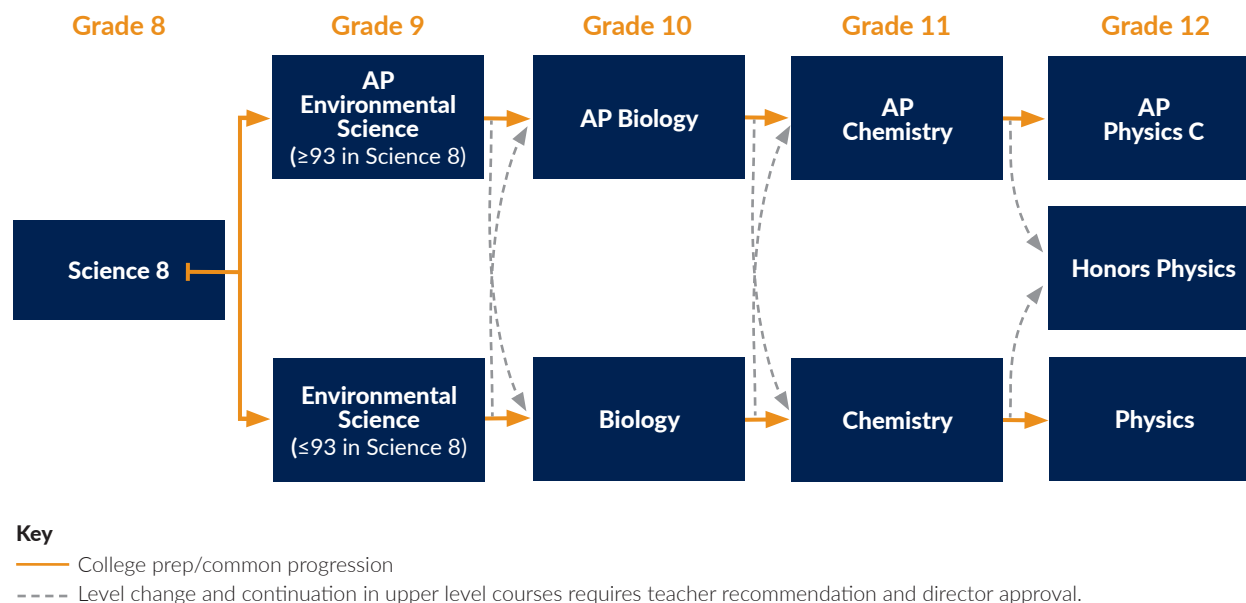


Science

This chart shows the course sequencing and progression of Science in Upper School. Four credits required to graduate and must include Biology, Chemistry, and Physics. Check course descriptions for all prerequisites.



Environmental Science

An elective, upper-level science course, Environmental Science integrates the study of the many components of Earth's environments (including the human impact on our planet). Students will investigate topics with a global framework and will be encouraged to evaluate environmental processes and impacts on the Earth as one interconnected system. The study of environmental science integrates biology, chemistry, physics, Mathematics, and technology while simultaneously encouraging critical thinking, analysis, and often ethics on the part of the student.

Prerequisite: none

Credit: 1.0 unit

AP Environmental Science

An elective, college-level course, AP Environmental Science will provide students with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world, to identify and analyze environmental problems both natural and human-made, to evaluate the relative

risks associated with these problems, and to examine alternative solutions for resolving and/or preventing them. Environmental science is interdisciplinary; it embraces a wide variety of topics from different areas of study. Yet there are several major unifying constructs, or themes, that cut across the many topics included in the study of environmental science.

Prerequisite: a grade of 93 or higher in 8th grade science and teacher recommendation

Out of Class Expectation: 2.5 hours/week

Credit: 1.0 unit

Biology

A required sophomore level science course, the course is designed to prepare students for introductory college biology. Students will better understand the living world around them after taking the class and be able to apply their scientific knowledge when making choices in the future. Biology focuses on cells, genetics, evolution, plants and animals.

Prerequisite: none

Credit: 1.0 unit

AP Biology

A college level course that is significantly different than high school biology. This course covers two (2) semesters of college-level biology coursework. AP Bio students should be prepared to spend significant amounts of time outside of class reading their textbook and independently studying. Class time is reserved for lab activities, group discussions, modeling biological processes, current case studies, and assessments. AP Bio is a rigorous course that will expose students to college-level biological concepts; such as biochemistry, cellular biology, cellular metabolism, cell reproduction, heredity, gene expression and regulation, natural selection, and ecology. The course will prepare students for freshmen undergraduate college biology. Each student will take the AP exam in the spring.

Prerequisites: Biology and Chemistry are required and teacher recommendation

Out of Class Expectation: 3 - 4 hours/week

Credit: 1.0 unit

Chemistry

Chemistry focuses on the structure and behavior of atoms (elements), the composition and properties of compounds, the reactions between substances with their accompanying energy exchange, and the laws that unite these phenomena into a comprehensive system. Chemistry is not an isolated discipline, for it merges into physics and biology. Chemistry evolved from the medieval practice of alchemy. Its bases were laid by such men as Boyle, Lavoisier, Priestly, Berzelius, Avogadro, Dalton and Pasteur.

Prerequisite: Algebra II (can be taken concurrently)

Credit: 1.0 unit

AP Chemistry

A college level course which includes an in-depth analysis of the basic topics covered in introductory chemistry with advanced problem solving techniques in stoichiometry, kinetics, equilibrium, qualitative and quantitative analysis, acid/base and buffer chemistry, electro chemistry, thermodynamics, gas laws, nuclear chemistry, quantum mechanics, VSEPR theory, molecular orbital and bonding theories, and oxidation/reduction reactions. Advanced laboratory experiments are a required component of AP Chemistry. Each student will take the AP exam in the spring.

Prerequisite: AP Pre-Calc (can be taken concurrently) and teacher recommendation

Out of Class Expectation: 2.5 hours/week

Credit: 1.0 unit

Physics I

The physics curriculum includes more abstract concepts such as interactions of matter and energy, velocity, acceleration, force, energy, momentum, and charge. Students investigate physics concepts through experience in laboratories and field work using the processes of inquiry. Students will learn about basic topics such as motion, forces, energy, momentum, circular motion, and universal gravitation. Students will be engaged in scientific inquiry, investigations, and labs so that they develop a conceptual understanding and basic scientific skills. The mathematics prerequisite skills are based on basic high school mathematics topics such as data analysis, measurement, scientific notation, ratio and proportion, and algebraic expressions.

Prerequisite: Algebra II

Credit: 1.0 unit

Honors Physics I

Physics seeks to describe and predict natural events by seeking the relationships between motion, force, energy, and time. Physics is at the root of all types of engineering -mechanical, electrical, nuclear, chemical engineering. This course will discuss the basics in fields of physics such as 1-D kinematics, 2-D kinematics, forces, dynamics, energy, electricity, waves, and sound. The number one priority is to learn how to think critically, in a scientific manner, about the physical environment. There will be many labs to explore the concepts of physics. The mathematics prerequisite skills are based on higher level high school mathematics topics such as data analysis, measurement, scientific notation, trigonometry, ratio and proportion, and algebraic expressions.

Prerequisite: AP Pre-Calc or Pre-Calc with grade above 93 and teacher recommendation

Credit: 1.0 unit

AP Physics C: Mechanics

This course provides advanced students with the second year of classical physics in preparation for the AP Physics C exam. Through the use of integral and differential calculus students develop a deeper understanding of fundamental concepts of the mechanics of physics. Topics studied include: kinematic equations, Newtons Laws of Motion, work and energy, linear momentum, rotation of objects around a fixed object and universal gravitation.

Students do not need to have completed calculus before taking the course. However, students must be taking Calculus AB/BC while taking AP Physics-Mechanics.

Students are required to take the AP exam in the spring.

Prerequisite: currently taking or have passed AP Calculus BC and teacher recommendation

Out of Class Expectation: 4 - 5 hours/week

Credit: 1.0 unit