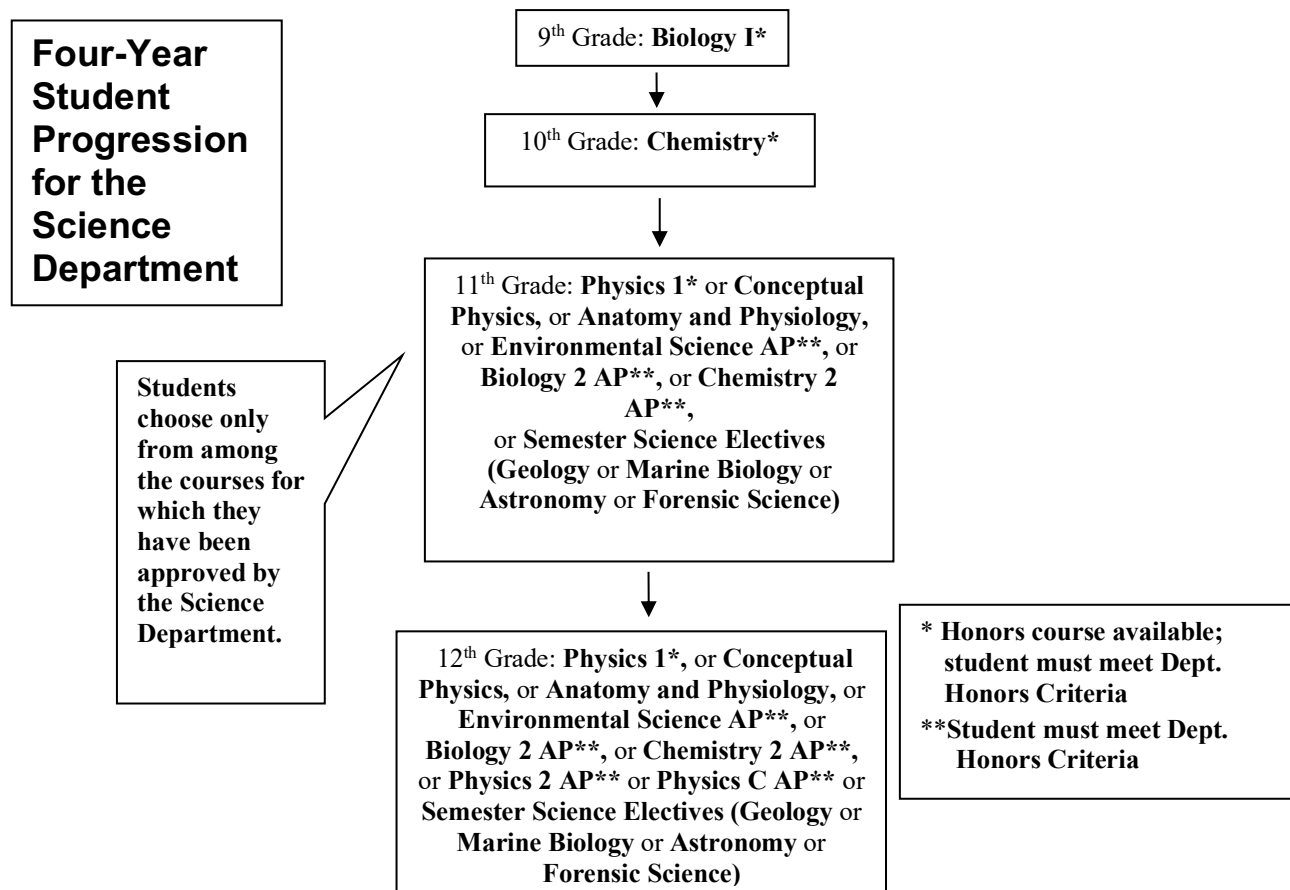


## Science Requirement

The **Science** requirement is fulfilled when a student takes **Biology 1**, **Chemistry 1**, and one physics-based science course from among the following: **Conceptual Physics**, **Physics 1**, or **Physics 1 Honors**.

The many choices available in the sciences are intended to fulfill the diverse needs of EHS's varied student body. The options available to students are governed by student choices, as well as placement by the Science Department. The Department strives to give students options for courses in which they can succeed, based upon their aptitude. For example, **Conceptual Physics**, rather than the more mathematically intensive **Physics 1** course, is offered to those students who think more conceptually and are not planning on an engineering career.

Any course taken beyond the third year of science will count toward the graduation requirements in the "**Other Electives**" category.



## Science Department

<b>Title</b>	<b>Credit</b>	<b>Who May Take</b>	<b>Description</b>	<b>Prerequisites</b>
<b>Biology 1</b>	Full Year	Freshmen	Investigation of traditional first-year topics: comparative phylogenetic study of invertebrates, vertebrates, and plants, with emphasis on biochemistry, cellular structure, and genetics.	None
<b>Biology 1 Honors</b>	Full Year	Freshmen	Expansion of Biology 1, including a stronger emphasis on photosynthesis/respiration and an overview of human anatomy, with enhanced laboratory and analytical assignments.	Dept. Honors Criteria; concurrent enrollment in Geometry Honors
<b>Chemistry 1</b>	Full Year	Sophomores	Investigation of traditional first-year topics from a modeling approach through the use of mathematics, analysis, and laboratory experiences. Topics include properties of matter, atomic structure, quantum mechanics, chemical reactions, stoichiometry, gas laws, solutions.	Biology 1 and Algebra 1
<b>Chemistry 1 Honors</b>	Full Year	Sophomores	Expansion of Chemistry 1, using greater depth of analysis, applying more extensive and complex calculations, and exploring a wider breadth of topics, including oxidation and reduction, kinetics, equilibrium, and bonding. Application and expansion of Algebra 2 Honors concepts.	<b>A</b> in Biology 1 or <b>B</b> in Biology Honors; <b>A</b> in Geometry or <b>B</b> in Geometry Honors; Dept. Honors Criteria; concurrent enrollment in Algebra 2 Honors
<b>Conceptual Physics</b>	Full Year	Juniors, Seniors	Investigation of traditional first-year topics with an emphasis on concepts, rather than mathematical analysis. Topics include mechanics, electrostatics, electricity, magnetism, heat, waves, sound, and light.	Must have completed Biology 1 and Chemistry 1
<b>Physics 1</b>	Full Year	Juniors, Seniors	Investigation of all traditional first-year topics through the use of mathematics, analysis, and laboratory experiences. Topics include mechanics, heat, electrostatics, electricity, magnetism, waves, sound, and light.	<b>B</b> or better in Chemistry and Algebra 2; teacher recommendation; concurrent enrollment in Precalculus
<b>Physics 1 Honors</b>	Full Year	Juniors, Seniors	Expansion of Physics 1 topics using more intense mathematics, analysis, and laboratory experiences with an emphasis on problem-solving and critical-thinking skills. Topics include mechanics, rotational motion and universal gravitation, heat, electrostatics, electricity, magnetism, waves, sound, light, and optics.	<b>A</b> in Chemistry 1 or <b>B</b> in Chemistry 1 Honors, and <b>A</b> in Algebra 2 or <b>B</b> in Algebra 2 Honors; Dept. Honors Criteria; concurrent enrollment in Precalculus Honors
<b>Anatomy and Physiology</b>	Full Year	Juniors, Seniors	Study of the form and functions of the human body, including the muscular, skeletal, nervous, endocrine, circulatory, respiratory, digestive, and reproductive systems, and topics in histology.	Must have completed Biology 1 and Chemistry 1

## Science Department (continued)

Title	Credit	Who May Take	Description	Prerequisites
<b>Introduction to Engineering</b>	Full Year	Juniors, Seniors	As a science elective course developed by a team of University of Texas faculty in collaboration with NASA engineers and secondary education specialists, this course engages students in authentic engineering practices in a project-based environment. Students will work in a team setting collaborating on projects including design, data-based standards and safety regulations, redesign based on requirements, prototype construction and testing, team coordination and delegation, production processes and cost analysis. (Does not qualify as a NCAA approved course.)	Must have completed Biology 1 and Chemistry 1
<b>Environmental Science AP</b>	Full Year	Juniors, Seniors	College-level course that investigates principles, concepts, and methods needed to understand the interrelationships of the natural world. Topics include earth systems and resources, ecology, population, land and water use, energy resources and consumption, pollution, and global change.	<b>B</b> or better in both Chemistry and Geometry courses; Dept. Honors Criteria
<b>Biology 2 AP</b>	Full Year	Juniors, Seniors	College-level course involving detailed investigations of all the major areas of modern biology, with a special focus on the molecular and chemical basis of life, including biochemistry, cellular biology, enzymes, energy transformation, genetics and molecular biology, adaptation, botany, zoology and ecology.	<b>B</b> or better in both Chemistry and Geometry courses; Dept. Honors Criteria
<b>Chemistry 2 AP</b>	Full Year	Juniors, Seniors	College-level course involving detailed investigations of all the major areas of modern chemistry with a special focus on the theoretical aspects of chemistry in addition to the content of general chemistry courses. Topics such as the structure of matter, kinetic theory of gases, chemical equilibria, chemical kinetics and the basic concepts of thermodynamics are presented in considerable depth.	<b>B</b> or better in Chemistry 1 Honors with concurrent enrollment in Precalculus or higher math class; Dept. Honors Criteria
<b>Physics 2 AP</b>	Full Year	Seniors	College-level course that explores extended topics in physics and uses extensive mathematical and theoretical modeling. Topics include interference, wave/particle duality, mass/energy, atomic physics, fluid dynamics, thermodynamics, and electromagnetic induction.	<b>B</b> or better in both Physics 1 Honors and Precalculus Honors; or <b>A</b> in Physics 1 with instructor's approval; Dept. Honors Criteria
<b>Physics C AP</b>	Full Year	Seniors	College-level course intended to provide exposure to the equivalent material to the first year of calculus-based college physics. The broad topics areas are Mechanics, and Electricity and Magnetism. Besides reviewing all appropriate content from Physics I Honors, extended topics will include circular motion, rotational dynamics, RC circuits, electromagnetic induction, Faraday's Law, Lenz's Law and Maxwell's equations.	<b>B</b> or better in both Physics 1 Honors and Precalculus Hon; Dept. Honors Criteria; concurrent enrollment in Calculus

## Science Department (continued)

Title	Credit	Who May Take	Description	Prerequisites
<b>Geology</b>	Semester	Juniors, Seniors	Study of minerals, igneous, sedimentary, and metamorphic rocks; geological formations; the changes affecting the earth's crust; and plate tectonics. Lab activities include specimen identification, correlation, contour lines, and general mapping skills.	Must have completed Biology 1 and Chemistry 1
<b>Marine Biology</b>	Semester	Juniors, Seniors	Study of the marine environment, oceanography, marine diversity (survey of marine plants and animals), and marine ecology. Lab exercises will be conducted to emphasize laboratory skills, proper technique, safety, report writing, and analysis.	Must have completed Biology 1 and Chemistry 1
<b>Astronomy</b>	Semester	Juniors, Seniors	Study of stellar and planetary motions, the development of stellar objects, and evolutionary models of the Universe. Students who take astronomy should be aware of the history, the key information, and the current developments in astronomy at such a level that they are able to comprehend current articles in the popular press.	Must have completed Biology 1 and Chemistry 1
<b>Forensic Science</b>	Semester	Juniors, Seniors	An inquiry-rich hands-on course that focuses on the practices and analysis of physical evidence found at a crime scene, Forensic Science is the application of chemistry, physics and biology. This course is a practical way for students to apply the scientific process introduced in previous science courses.	Must have completed Biology 1 and Chemistry 1

## Honors Criteria for the Science Department

Common considerations for placement in an honors or AP science course are standardized test scores—including reading comprehension scores—and Department recommendations, based upon performance in previous science and math courses. The EHS placement exams in both math and science are considered when placing freshmen in Biology I Honors.

To succeed in the science honors program, a student should be self-motivated and capable of self-directed study. In addition, he/she should be able to independently integrate and organize concepts previously addressed in mathematics and science into new applications and problems; to work independently or in small groups to solve complex problems through analysis, calculations, and experimentation; and to use inductive reasoning in analyzing data and evaluating the validity of results.