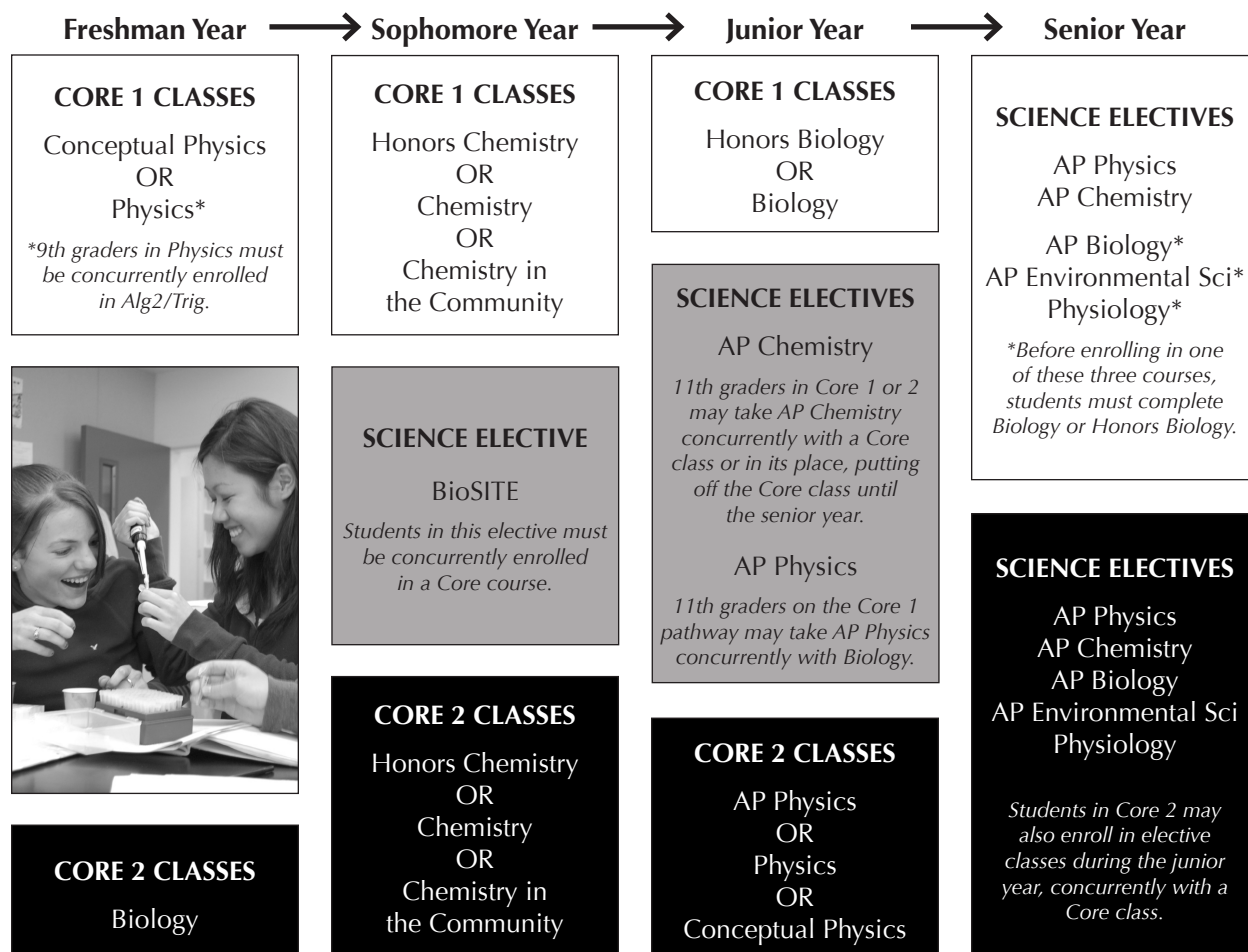


SCIENCE

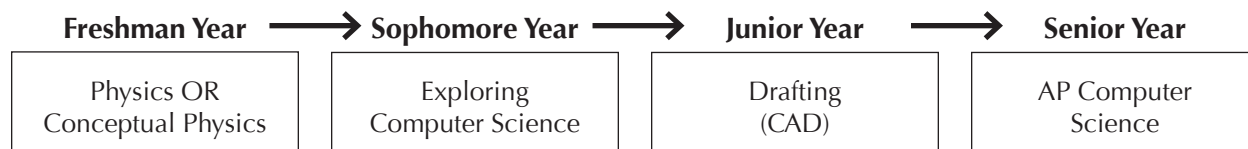
P I O N E E R
H I G H
S C H O O L

OUR SCIENCE PROGRAM is currently transitioning to a new “Physics First” curricular pathway. We strongly feel this new pathway will help students build a solid foundation in scientific knowledge and understanding that will prepare them for the 21st century. Taking physics first will allow students to master basic concepts of forces and energy that are crucial to many chemistry topics. Taking physics first will also help students to build a knowledge base that translates to today’s modern biology focus on molecular biology and biochemical processes. Finally, a “physics first” curriculum will allow a connection to the Algebra concepts students learn during the freshman year and a better integration of engineering and technology skills throughout the pathway. Our transition to a physics first curriculum is in its early stages. Due to credential and staffing limitations, it will take a few years to move to a full physics first curriculum for all students. As such, our offerings of ninth grade Conceptual Physics and regular Physics will be limited, and we will continue to offer a traditional pathway of Biology at 9th grade, followed by Chemistry at 10th grade, and Physics at 11th grade. This pathway has been successful in the past in helping students learn the main concepts of each individual course. The Physics First pathway is illustrated in the white boxes below. The Biology First pathway is illustrated in the black boxes below. The grey boxes apply to both pathways.



CTE / ENGINEERING PATHWAY

The Career Technical Education / Engineering pathway is an interdisciplinary curricular strand that has been under development for several years. This pathway is a series of courses offered by multiple departments designed to prepare students for a college degree or career in computers and/or engineering. This strand aims to prepare students with 21st century technical skills, specifically in computer programming and engineering concepts. (Note: Classes in this series may be taken individually if a student's schedule does not have room for each course, and the courses do not have to be taken in the suggested order.)



CORE COURSE DESCRIPTIONS

Physics explores the fundamental concepts behind motion, force, and energy, with a quantitative emphasis. (*Prerequisite: concurrent enrollment in Alg2*)

Conceptual Physics covers all of the same concepts as regular Physics but with less emphasis on quantitative computation. (*Prerequisite: none*)

Chemistry covers the fundamental atomic and molecular structures of matter, chemical bonding, and analysis of chemical reactions. (*Prerequisite: Alg1*)

Honors Chemistry covers greater breadth and depth than regular Chemistry, including organic chemistry. (*Prerequisite: concurrent enrollment in Alg2*)

Chemistry in the Community covers environmental chemistry and is for college-bound students who will be non-science majors. (*Prerequisite: Alg1*)

Biology covers structures and processes common to all living systems, with an emphasis on biochemical and cellular concepts. (*Prerequisite: none*)

Honors Biology covers greater breadth and depth than regular Biology, with an emphasis on analysis and critical thinking. (*Prerequisite: Chem*)

ELECTIVE COURSE DESCRIPTIONS

BioSITE students teach field ecology in three local elementary schools and lead teams of 4th graders in weekly field expeditions through a local watershed preserve. (*Prerequisite: sophomore standing*)

Physiology studies the structure, function, and relationships of the major systems of the human body and the comparative anatomy of other animals. (*Prerequisite: Biology or Honors Biology*)

AP Courses cover material that would normally be included in a first-year college course of the same discipline. Each course prepares students to take a College Board Advanced Placement exam, through which students may earn college credit. Pioneer currently offers four AP science electives: AP Biology, AP Chemistry, AP Physics, and AP Environmental Science. (*Prerequisites: varies by course*)

DEPARTMENT FACULTY 2011-2012

Mr. Rick Austin, Cal Poly Pomona
Conceptual Physics

Mr. Steve Boyd, San Jose State
Biology, Physiology

Mr. Matt Holm, Cal Poly San Luis Obispo
Physics, AP Physics, AP Computer Science

Ms. Jennifer McCurley, San Jose State
Earth Science

Dr. Colleen McDonough, UC Berkeley, UCLA (PhD)
Physics

Mr. Kyle Murdock, Armstrong Atlantic State
Biology, AP Environmental Science

Ms. Kelly O'Hara, Santa Clara
Biology, Chemistry in the Community

Mr. Micheal Pearl, UC Berkeley
Chemistry, AP Chemistry

Dr. David Schull, Furman Univ, Penn State (PhD)
Chemistry, Honors Chemistry

Mr. Sean Ward, Carnegie Mellon
Conceptual Physics, Exploring Computer Science

Mr. Rob Zaccheo (dept chair), UC Santa Barbara
Biology, Honors Cell Biology, AP Biology, BioSITE