ADVANCED PLACEMENT PHYSICS

Why Advanced Placement Courses? And Why AP Physics?

High school Advanced Placement courses are designed to replace introductory courses in American colleges and universities. Further, AP courses allow you to experience the rigors of a true college class and even earn credit for doing so, which can save you time and money.

Regardless of the outcome of the AP exam, you will have developed skills and earned valuable experience that will be advantageous in your future academic careers. In addition, college admission boards and scholarship committees throughout the world look for such endeavors on your transcripts.

Advanced Placement courses are also an excellent choice for students in an AICE program, students who are considering out-of-state schools, and for military students. The AP program is recognized globally for college credit, is more likely to transfer to schools outside of Florida, and is designed to replace introductory courses in American colleges.

Students enrolled in AP Physics courses work hard, but this work is rewarded with better problem-solving skills, improved analytical thinking, a deeper understanding of science, and the possibility of graduating high school with college credit in physics.

What is Physics?

You can't play a game if you don't know the rules, and the more you know the rules the more you enjoy the game! Physics is the study of nature's "rules" – the rules and laws governing the universe in which you are a part. So, to learn physics is to learn about ourselves and the arena of physical and natural laws that govern all aspects of our lives, from the atoms within our cells to the motions of galaxies and the energies in distant quasars!

AP Physics and You

There are two academic tracks for AP Physics:

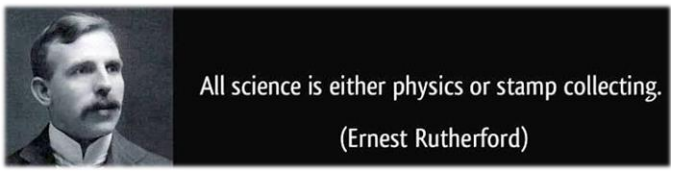
1. If you are considering a major or career in biology, medicine, chemistry, geology, and so on, the two-year sequence of AP Physics 1 and 2 may be for you! This sequence generally satisfies the requirement for non-physics majors but for those majoring in other sciences. AP Physics 1 and 2 are the equivalent of one year of college of algebra-based physics. Unlike many other AP courses, a semester of a college physics course is taught in one year of high school. So, AP Physics 1, a two-semester high school course, is the equivalent of the first semester of a college algebra-based physics sequence. Many also simply take AP Physics 1 to get the experience, earn the recognition, and enter college with a physics semester behind them.

2. Perhaps you are thinking about physics, astronomy, engineering, or mathematics as a major. Then the AP Physics C sequence may the option to consider. This sequence is calculus-based and typically satisfies the 200-level introductory physics sequence required for the majors mentioned above. A calculus course is required as a co-requisite at the minimum; indeed, the calculus and AP Physics instructor work closely together to ensure that the students are getting the maximum learning experience! Like the AP Physics 1 and 2 sequence, the two-year high school AP Physics C sequence covers one year of college physics. These two courses are:
    a. AP Physics C: Mechanics. A one-year high school course that covers the first half of college calculus-based introductory physics course.
    b. AP Physics C: Electricity and Magnetism. A one-year high school course that covers the second half of college calculus-based introductory physics course.

The course descriptions may be found at the end of this document. Be sure to pay attention to the math requirements and co-requisites.

Note that each AP Physics sequence is designed to be self-contained and is independent of the other, each beginning with first principles. So, neither Physics 1 nor Honors Physics is required to start either AP Physics sequence, and AP Physics 1 and 2 are not are not prerequisites for AP Physics C. And, as always, consult with the colleges and universities you are considering to discuss your academic goals and how any Advanced Placement course would fit into that plan.

I hope you consider taking accepting the challenge of AP Physics. While we will be preparing for a very challenging exam, we will also journey into fantastic ideas that are the foundation for all other sciences. Please feel free to stop by my classroom (Room 248) if you have questions or issues, and I look forward to seeing your name on my roster in the fall!



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THE BENFITS OF ADVANCED PLACEMENT CLASSES

Thinking about taking an AP class? Here is some information about the program.

Students develop college level academic skills.

Enrolling in AP courses enable students to develop more rigorous study habits and take on more responsibility that parallels what they will see in college level academics. Advanced Placement courses challenge students and allow them to build critical thinking skills while working on their ability to collaborate in groups.

Colleges are more interested in students with AP experience.

Taking an AP course can also help students boost their grade point average (GPA) and provides an additional factor for colleges or universities to consider when examining applications for admission and scholarships. Approximately 85 percent of selective colleges and universities reported that they looked at whether or not a student had taken an AP course to make their admissions decisions (See: www.collegeboard.org). College admissions counselors view students that take AP course work as being hard-working, self-motivated, and able to take on the challenges necessary to further their education and having a greater success rate in college.

Advanced Placement courses increase student eligibility for some scholarships.

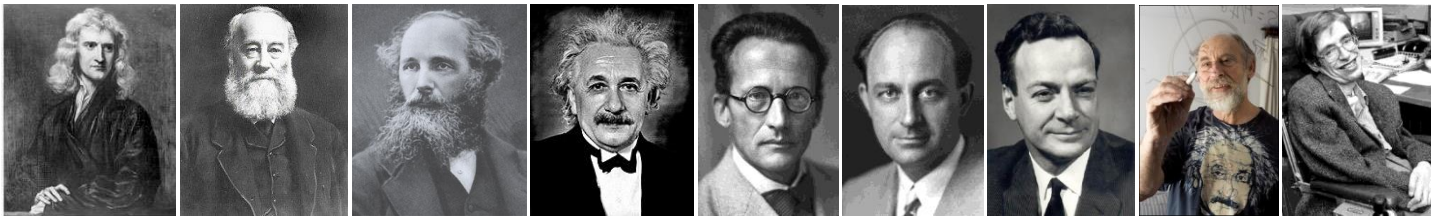
Approximately 31 percent of colleges and universities will consider a student's AP course work when making decisions about which students will receive scholarships. Students can check www.collegeboard.org, www.fastweb.com, or www.scholarships.com for more information.

Taking AP classes might allow students to fulfill some of their general education course requirements.

By successful completing an AP program, students begin their freshman year in college with some requirements already met. With those classes out of the way students might have more time to take up a double major, pursue a minor, or take elective courses. Advanced Placements courses are designed to be recognized and transferable in American universities. Further, the Department of Defense recommends the Advanced Placement program for military students, transfer students, and for those students who are interested in out-of-state institutions. Students should check with the college or university that they are interested in attending to learn more about that institution's AP requirements.

Students may be able to save time and money.

If students take AP classes throughout their high school careers they could potentially save money because they would not be paying college tuition for the AP courses they successfully passed in high school. Students may also find that they would have the possibility of graduating from college a semester or even a year earlier, giving them a head start on a career or graduate school. These are very important considerations that need to be discussed with your AP teachers and representatives from individual colleges and universities.



AP PHYSICS COURSE DESCRIPTIONS

Upon completion of the courses, students may take the AP Physics 1, 2, or C exam for college credit. College-level study skills are needed for the academic rigor, pace, and inquiry-based investigations of these courses.

AP Physics 1

Prerequisites: B or higher in Algebra I, completion or co-enrollment of Algebra II, and teacher recommendation. The completion of a chemistry sequence is recommended but not required. No prerequisite physics course is necessary. Students who have completed the AICE Physics sequence would also benefit from this course.

This algebra-based college-level physics course includes the use of the scientific method and its practices to solve problems; use of metric measurements, SI units, and laboratory instruments; the principles of kinematics in one- and two-dimensions; identification and use Newton's Laws of Motion (dynamics, including vector analysis, gravitation, and circular motion and orbits) and the application of conservation laws in classical mechanics; work, energy, and conservation of energy in conservative and nonconservative systems; linear and angular momentum and the conservation of momentum; torque and rotational analysis; and oscillations and simple harmonic motions, including simple and physical pendulums. The relationships among science, society, and technology are also examined, as well as current events. This course is the equivalent of the first semester of a college algebra-based physics sequence.

AP Physics 2

Prerequisites: Successful completion of the AP Physics 1 course (passing the AP Physics 1 exam is not required – students who did not pass the AP Physics 1 exam will have an opportunity to retake the exam); B or higher in Algebra II; completion or co-enrollment in Pre-Calculus is recommended.

This algebra-based college-level physics course is a continuation of AP Physics 1 and includes investigations in fluid dynamics; thermodynamics, including kinetic theory and an introduction to statistics; electromagnetic waves and physical and geometric optics; magnetic fields and magnetic inductance; electrostatics; ; mechanical waves and sound; DC circuits and Ohm's Law: RC circuits and capacitance; and modern physics, including quantum, atomic, and nuclear physics. The relationships among science, society, and technology are also examined, as well as current events. This course is the equivalent of the second semester of a college algebra-based physics sequence.

AP Physics C: Mechanics

Prerequisites: Completion or co-enrollment of calculus and teacher recommendation. Note: AP Physics 1 and/or AP Physics 2 is not a required prerequisite for this course. Students who have completed the AICE Physics sequence would also benefit from this course. However, no prerequisite physics course is necessary.

AP Physics C: Mechanics is an intensive, calculus-based college-level course that is intended for students interested in majors/careers in physics, mathematics, or engineering. Although fewer topics are covered in the AP Physics C sequence than in AP Physics 1 and 2, they are covered in greater depth and with greater analytical and mathematical sophistication, including the application of differential and integral calculus, to develop a deeper and more intuitive understanding of physics. AP Physics C: Mechanics explores the following topics: Kinematics, Newton's Laws of Motion; work, energy, and power; systems of particles and linear momentum; circular motion and rotation; and oscillations and gravitation. Inquiry-based instruction is employed throughout the course to cultivate analytical reasoning skills. The relationships among science, society, and technology are also examined, as well as current events. Upon completion of the course, students may take the AP Physics C: Mechanics exam for college credit equivalent to the first semester of calculus-based physics (required for physics and engineering majors). Due to the rigor and pace of the content, this course is designed to challenge extremely motivated students who have a strong interest in science.

AP Physics C: Electricity and Magnetism

Prerequisites: Successful completion of the AP Physics C: Mechanics course (passing the AP Physics C: Mechanics exam is not required – students who did not pass the AP Physics C: Mechanics exam will have an opportunity to retake the exam).

AP Physics C: Electricity and Magnetism is an intensive, calculus-based college-level course that is intended for students interested in majors/careers in physics, mathematics, or engineering. Although fewer topics are covered in the AP Physics C sequence than in AP Physics 1 and 2, they are covered in greater depth and with greater analytical and mathematical sophistication, including the application of differential and integral calculus, to develop a deeper and more intuitive understanding of physics. AP Physics C: Electricity and Magnetism explores the following topics: Electrostatics; conductors, capacitors, and dielectrics; electric circuits; magnetic fields; and electromagnetism. Inquiry-based instruction is employed throughout the course to cultivate analytical reasoning skills. The relationships among science, society, and technology are also examined, as well as current events. Upon completion of the course, students may take the AP Physics C: Electricity and Magnetism exam for college credit equivalent to the second semester of calculus-based physics (required for physics and engineering majors). Due to the rigor and pace of the content, this course is designed to challenge extremely motivated students who have a strong interest in science.

LINKS

College Board AP Program Main Page

AP Capstone Diploma Program Main Page

AP Physics 1 College Board Main Page

AP Physics 2 College Board Main Page

AP Physics C: Mechanics College Board Main Page

AP Physics C: Electricity and Magnetism College Board Page

Oakleaf High School Advanced Placement/Capstone Diploma

Oakleaf High School Science National Honor Society