

Course Name: AP Physics C

Duration: 1 Semester Full Year

Grade Level: 9th 10th 11th 12th (check all that apply)

Are there any prerequisites for the course?

Science Prerequisite: None, but Honors 9 Physics is encouraged

Math Prerequisite: At least concurrent enrollment in Calculus A/B

WHAT this course is about:

AP Physics C is a college level introductory calculus-based Physics course in the supportive environment of the high school setting. The purpose of first semester (Mechanics) is to learn the first principles of physical science: motion, force, conservation laws. The purpose of second semester (Electricity and Magnetism) is to learn field theory and electrical circuits. Problem solving skills will be developed using foundational concepts. The willingness, first to be challenged and then to learn from both failure and success, is an essential attitude.

WHY take this course:

Physics is the second oldest science, after astronomy. All physical sciences use the concepts that are developed in this class, and all other quantitative sciences can be reduced to problems in physical quantities. In any physics course the student learns how to see the world in a new way, a way that allows the student to understand, explain and predict anything that has mass or energy. AP Physics C is unique because it prepares students for technical careers (engineering, physical sciences).

WHAT you'll learn:

- Determine strategies of what helps you learn and develop conceptual understanding.
- Conceptual understanding at the college level with various topics in physics.
- Analytical and critical thinking, with emphasis on problem solving skills appropriate for any higher level of academia.
- The proper role and limitations of mathematical models of behavior.
- Theoretical physics skills, including mathematical modeling and the use of equations to make predictions about the universe we live in.
- Experimental physics skills, including experimental design, data analysis and basic statistics.
- Hands-on approaches to learning, including science and engineering practices.

WHAT you'll do:

- Hands-on science and engineering investigations, from guided activities to open inquiry.

- Systems analysis for a variety of familiar situations, from arcade games to the Big Bang Theory.
- Engage in an I do, we do, you do approach to learning.
- Have options for deepening practice and understanding physics concepts
- Work collaboratively with others in a variety of thinking, processing, and hands-on activities

WHERE this could take you:

AP Physics C can bring about many opportunities for students. For students who opt to take the AP Physics C Exams in May, there is a possibility of credit and/or course advancement for students achieving a 3 or above. This is dependent on the university/college of attendance and major of study. Regardless of AP Physics C Exam outcomes, students have strong foundations in college physics that will help them in their future college requirements.

OPTIONAL Course Outline (“scope and sequence”, sequence chart, etc.)

Year at a Glance for AP Physics C

- Mech1 Kinematics, the study of motion (position, velocity, acceleration).
- Mech2 Newton’s Laws, the foundational material for most engineering fields.
- Mech3 Work and Energy, the study of open systems, a connection with Newton’s Laws.
- Mech4 Systems of Particles, an introduction to the Conservation Laws (Energy and Momentum).
- Mech5 Rotation, an extension of previous units into rotational motion.
- Mech6 Oscillations, an extension of previous units into vibrational motion.
- Mech7 Gravitation, the study of Kepler’s Laws and Newton’s Universal Law of Gravitation.
- E&M1 Electrostatics, a transition to field theory using Coulomb’s Law.
- E&M2 Conductors, Capacitors, Dielectrics, a brief explanation of how chemistry is really just simple physics.
- E&M3 Electrical Circuits, the mathematical models of circuit behavior, culminating in the behavior of oscillating circuits (eg. Radio transmitters and receivers).
- E&M4 Magnetic Fields, the mathematical description and development of Maxwell’s Equations.
- E&M5 Electromagnetism, the unification of the Electric and Magnetic fundamental forces into the single force of electromagnetism.
- AP PHYSICS C EXAMS
- Modern Physics Project