Oakwood City School District
AP Physics Science Standards

One goal of science education is to help students become scientifically literate citizens able to use science as a way of knowing about the natural and material world. All students should have sufficient understanding of scientific knowledge and scientific processes to enable them to distinguish what is science from what is not science and to make informed decisions about career choices, health maintenance, quality of life, community and other decisions that impact both themselves and others.

Oakwood High School teaches two separate College Board AP Physics classes (specifically, AP Physics C: Mechanics and AP Physics C: Electricity & Magnetism) as a single 1-year-long AP Physics class. The fall semester covers the content for AP Physics C: Mechanics, and the spring semester covers the content for AP Physics C Electricity & Magnetism. At the end of the year, students take two separate AP exams–one for Mechanics and one for Electricity & Magnetism.

AP Physics C: Mechanics is a calculus-based, college-level physics course. It covers kinematics; Newton's laws of motion; work, energy, and power; systems of particles and linear momentum; circular motion and rotation; oscillations; and gravitation.

AP Physics C: Electricity and Magnetism is a calculus-based, college-level physics course, especially appropriate for students planning to specialize or major in physical science or engineering. The course explores topics such as electrostatics; conductors, capacitors, and dielectrics; electric circuits; magnetic fields; and electromagnetism. Introductory differential and integral calculus is used throughout the course.

Standards for AP Physics C: Mechanics

Kinematics

A. Motion in One Dimension
B. Motion in Two Dimensions

Newton's Laws of Motion

A. First and Second Law
B. Circular Motion
C. Third Law

Work, Energy, Power

A. Work-Energy Theorem
B. Force and Potential Energy
C. Conservation of Energy
D. Power

Systems of Particles and Linear Momentum

A. Center of Mass
B. Impulse and Momentum
C. Conservation of Linear Momentum, Collisions

Rotation

A. Torque and Rotational Statics
B. Rotational Kinematics
C. Rotational Dynamics and Energy
D. Angular Momentum and Its Conservation

Oscillations

A. Simple Harmonic Motion
B. Springs and Pendulums

Gravitation

A. Gravitational Forces
B. Orbits of Planets and Satellites

Standards for AP Physics C: Electricity and Magnetism

Electrostatics

A. Charge and Coulomb's Law
B. Electric Field and Electric Potential
C. Electric Potential Due to Point Charges and Uniform Fields
D. Gauss's Law
E. Fields and Potentials of Other Charge Distributions

Conductors, Capacitors, Dielectrics

A. Electrostatics with Conductors
B. Capacitors
C. Dielectrics

Electric Circuits

A. Current and Resistance
B. Current, Resistance, and Power
C. Steady-State Direct-Current Circuits with Batteries and Resistors Only
D. Gauss's Law

Magnetic Fields

A. Forces on Moving Charges in Magnetic Fields
B. Forces on Current-Carrying Wires in Magnetic Fields
C. Fields of Long Current-Carrying Wires
D. Biot-Savart Law and Ampere’s Law

Electromagnetism

A. Electromagnetic Induction (Including Faraday’s Law and Lenz’s Law)
B. Inductance (Including LR Circuits)
C. Maxwell’s Equations