

Advanced Placement Physics C Syllabus

Mechanics

Vectors and Kinematics

Topics:

Vectors
Motion in One Dimension
Derivatives
Motion in Two and Three Dimensions
Projectile Motion
Relative Motion

Textbook Reference:

Chapters 2 and 3 (pp. 19 to 74)

Dynamics

Topics:

Newton's Laws
Weight and the Normal Force
Free-Body Diagrams
Inclines
Friction
Drag Forces
Circular Motion

Textbook Reference:

Chapters 4 and 5 (pp. 83 to 139)

Work and Energy

Topics:

Work
Kinetic Energy
Power
Conservative Forces
Gravitational Potential Energy
Springs
Elastic Potential Energy
Conservation of Energy
Potential Energy Functions

Textbook Reference:

Chapters 6 and 7 (pp. 148 to 203)

Momentum, Collisions and Center of Mass

Topics:

Momentum
Impulse
Conservation of Momentum
Collisions (1-D and 2-D)
Center of Mass - Discrete
Center of Mass - Continuous
Center of Mass – Reference Frame
Rocket Propulsion

Textbook Reference:

Chapter 8 (pp. 212 to 246)

Rotation, Torque, Rolling and Angular Momentum

Topics:

Rotational Kinematics
Moment of Inertia
Rotational Kinetic Energy
Torque
Rotational Dynamics
Power
Rolling
Angular Momentum

Textbook Reference:

Chapter 9, sections 1-6 (pp. 257 to 281)
Chapter 10, sections 1-4 (pp. 295 to 309)

Gravitation, Orbits and Oscillations

Topics:

Gravitation and fields
Kepler's Laws
Gravitational Potential
Orbits
Simple Harmonic Motion
Oscillating Systems

Textbook Reference:

Chapter 11, sections 1-5 (pp. 321 to 342)
Chapter 14, sections 1-3 (pp. 403 to 420)

Electricity and Magnetism

Electrostatics

Topics:

Coulomb's Law and Charge
The Electric Field
Gauss' Law
Electric Potential
Capacitance

Textbook Reference:

Chapter 22, sections 1-7 (pp. 657 to 678)
Chapter 23, sections 1-5 (pp. 688 to 710)
Chapter 24, sections 1-5 (pp. 720 to 742)
Chapter 25, sections 1-5 (pp. 752 to 771)

Circuits

Topics:

Current and Resistance
Ohm's Law
Series and Parallel Circuits
Kirchhoff's Rules
Ammeters and Voltmeters
RC Circuits

Textbook Reference:

Chapter 26, sections 1-6 (pp. 787 to 815)

Magnetism and Induction

Topics:

Magnetic Fields
Magnetic Forces
The Biot-Savart Law
Ampere's Law
Magnetic Flux, Faraday's Law and Lenz's Law
Inductance and RL Circuits
Maxwell's Equations

Textbook Reference:

Chapter 28, sections 1-2 (pp. 856 to 867)
Chapter 29, sections 1-4 (pp. 884 to 900)
Chapter 30, sections 1-8 (pp. 928 to 947)
Chapter 32, sections 1-2 (pp. 1000 to 1003)