



# SYLLABUS

Welcome to the FlinnPREP™ AP\* Physics 1 Online Prep Course! Your enrollment in this course is your first step toward a 5 on the AP\* Physics 1 exam. FlinnPREP™ covers fundamental concepts in physics using clear and concise text, vibrant images, practice problems with fully worked solutions, illustrative videos, engaging animations and end-of-unit summaries and assessments. All of the content can be viewed on a desktop, tablet or phone, so you can prepare for AP\* Physics 1 conveniently and on the go.

## Unit 1 – Kinematics

- Motion
- Motion Diagrams
- Using Graphs to Describe Motion
- The Kinematic Equations
- Vector Description of Motion
- Motion in Two Dimensions
- Two-Dimensional Kinematics
- Projectile Motion

## Unit 2 – Dynamics

- Overview of Forces
- Inertia
- Mass
- Types of Forces
- Newton's First Law of Motion
- Newton's Second Law of Motion
- Newton's Third Law of Motion
- Free Body Diagram
- Friction as a Force
- Problem-Solving Strategy
- Analyzing Forces

## Unit 3 – Circular Motion

- Angular Position, Velocity and Acceleration
- Rotational Motion with Constant Angular Acceleration
- Relationship Between Linear and Angular Quantities
- Uniform Circular Motion
- Centripetal Acceleration
- Universal Gravitation
- Calculating Free-Fall Acceleration
- Gravitational Force
- Orbital Motion

## Unit 4 – Energy

- Overview of Work and Energy
- Work
- Kinetic Energy and Work
- Potential Energy
- Conservative and Nonconservative Forces
- Conservative Forces and Potential Energy
- Energy Graphs
- Conservation of Mechanical Energy
- Power

## Unit 5 – Momentum

- Momentum and Impulse
- Momentum of a System of Particles: Momentum Conservation
- Collisions and Momentum
- Inelastic Collisions
- Elastic Collisions
- Collisions in Two Dimensions
- Problem-Solving Techniques with Momentum

## Unit 6 – Torque and Rotational Motion

- Rotational Motion
- Torque
- Center of Mass
- Rotation of Point Masses About a Fixed Axis
- Rotational Kinetic Energy
- Angular Momentum
- Work, Power and Energy
- Rolling Motion

## Unit 7 – Simple Harmonic Motion

- Overview of Simple Harmonic Motion
- Values Related to Simple Harmonic Motion
- Restoring Forces
- Energy in Simple Harmonic Motion
- Circular Motion and Simple Harmonic Motion
- Mass-Spring System
- Simple Pendulum
- Damped Harmonic Oscillator

## Unit 8 – Mechanical Waves and Sound

- Wave Motion and Propagation
- Wave Interference and Standing Waves
- Waves on Strings: Speed of a Wave
- Energy Transmitted by a Wave
- Sound Waves
- The Doppler Effect
- Resonance
- Beats

## Unit 9 – Electrostatics

- Properties of Electric Charge
- Charging Objects
- Conductors and Insulators
- Coulomb's Law
- Multiple Charge Configurations
- Electric Fields

## Unit 10 – DC Circuits

- Electric Current
- Resistance
- Ohm's Law
- Electric Power
- Resistors in Series
- Resistor in Parallel
- Kirchhoff's Laws

ISBN: 978-1-933709-75-8

FlinnPREP™ Online Student Prep Course for AP\* Physics 1

For more information on this course, please contact the FlinnPREP™ team:

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