

**AP Physics 1 Syllabus**

**UNIT 1. KINEMATICS**

- Kinematics in one-dimension: constant velocity and uniform accelerated motion
- Vectors: vector components and resultant
- Kinematics in two-dimensions: projectile motion

**UNIT 2. DYNAMICS**

- Forces, types, and representation (FBD)
- Newton's First Law
- Newton's Third Law
- Newton's Second Law
- Applications of Newton's Second Law
- Friction
- Interacting objects: ropes and pulleys

**UNIT 3. CIRCULAR MOTION AND GRAVITATION**

- Uniform circular motion
- Dynamics of uniform circular motion
- Universal Law of Gravitation

**UNIT 4. ENERGY**

- Work
- Power
- Kinetic energy
- Potential energy: gravitational and elastic
- Conservation of energy

**UNIT 5. MOMENTUM**

- Impulse
- Momentum
- Conservation of momentum
- Elastic and inelastic collisions

## **UNIT 6. SIMPLE HARMONIC MOTION**

- Linear restoring forces and simple harmonic motion
- Simple harmonic motion graphs
- Simple pendulum
- Mass-spring systems

## **UNIT 7. ROTATIONAL MOTION**

- Torque
- Center of mass
- Rotational kinematics
- Rotational dynamics and rotational inertia
- Rotational energy
- Angular momentum
- Conservation of angular momentum

## **UNIT 8. MECHANICAL WAVES**

- Traveling waves
- Wave characteristics
- Sound
- Superposition
- Standing waves on a string
- Standing sound waves

## **UNIT 9. ELECTROSTATICS**

- Electric charge and conservation of charge
- Electric force: Coulomb's Law

## **UNIT 10. DC CIRCUITS**

- Electric resistance
- Ohm's Law
- DC circuits
- Series and parallel connections
- Kirchhoff's Laws