AP PHYSICS 1 – COURSE OUTLINE

UNIT 1: Kinematics

a. One-dimensional motion

- Constant velocity
- Uniformly accelerated motion
- Free-fall motion
- Equation, graphical, and verbal models

b. Two-dimensional motion

- Introduction to vector components and resultants
- Projectile motion
- Uniform circular motion

UNIT 2: Dynamics

a. Different types of forces and Free-body diagrams

b. Newton's Laws of Motion

- Newton's First Law
- Newton's Second Law
- Newton's Third Law

c. Forces on Inclines

d. Atwood Machines

e. Apparent Weight

UNIT 3: Circular Motion and Universal Law of Gravitation

a. Uniform circular motion

- Centripetal acceleration and centripetal force
- Forces acting in uniform circular motion

b. Universal Law of Gravitation

- Kepler's Laws

UNIT 4: Momentum & Collisions

a. Linear Momentum

b. Impulse

c. Conservation of Linear Momentum in different types of collisions

UNIT 5: Work, Energy, & Power

a. Definition of Work

- Relating forces and energy

- Revisiting uniform circular motion
- Positive and negative work

b. Energy

- Mechanical Energy
- Discussing other types of energy
- Objects and systems
- Conservation of energy

c. Power

UNIT 6: Simple Harmonic Motion

a. Hooke's Law

b. Restoring Forces and Equilibrium

- Simple Pendulums
- Mass-spring systems

c. Graphical, conceptual, and algebraic studies of simple harmonic motion.

UNIT 7: Rotational Motion

a. Point-mass versus a physical object

b. Concept of center of mass

c. Torque and its effects on the rotation of an object.

d. Rotational Energy and Kinematics

e. Moments of Inertia

f. Angular Momentum and its conservation.

UNIT 8: Electricity

a. Coulomb's Law
b. DC Circuits
c. Ohm's Law
d. Kirchhoff's Rules
e. Conservation of Charge

UNIT 9: Wave Motion

a. Types of Waves
b. Interference and Superposition
c. Properties of Waves
d. Models of Waves
e. Sound Waves
f. Resonance & Doppler effect.