

I. COURSE CONTENT – This course will consist of the following units of study:

- Introduction to AP Physics
 - *Measurement and Problem Solving*: Introduction; Standard units of Measurements; Angular Measure; Dimensional Analysis; Significant Figures; Unit Conversions; Problem Solving Techniques.
- Mechanics
 - *Kinematics: Description of Motion*: Scalar Quantities-Distance and Speed; Vector Quantities-Displacement, Velocity and Acceleration; Free Fall; Kinematic Equations.
 - *Motion in Two Dimensions*: Components of Motion; Vector Addition and Subtraction; Projectile Motion; Relative Velocity.
 - *Force and Motion*: Dynamics; Concept of Force and Net Force; Inertia and Newton's First Law of Motion; Newton's Second Law of Motion; Newton's Third Law of Motion; Free body Diagrams; Friction.
 - *Work and Energy*: Work Done by a Constant and Variable Force: Kinetic Energy; Potential Energy; Work-Energy Theorem; Conservation of Energy; Power.
 - *Linear Momentum and Collisions*: Linear momentum; Impulse; Conservation of Linear Motion; Elastic and Inelastic Collisions; Center of Mass.
 - *Circular Motion and Gravitation*: Angular Speed and Velocity; Uniform Circular Motion; Centripetal Acceleration; Angular Acceleration; Newton's Law of Gravitation; Kepler's Laws of Planetary Motion.
 - *Rotational Motion and Equilibrium*: Rigid Bodies; Translations and Rotations; Torque, Equilibrium and Stability; Rotational Dynamics; Rotational Work and Kinetic Energy; Angular Momentum.
- Oscillations and Waves
 - *Vibrations and Waves*: Simple Harmonic Motion; Wave Motion; Wave Properties; Standing Waves and Resonance.
 - *Sound*: Sound Waves; The Speed of Sound; Sound Intensity and Level; Sound Phenomena; The Doppler Effect.
 - *Reflection and Refraction*: Wave Fronts and rays; Reflection; Refraction; Diffraction
- Electricity
 - *Electric Charge, Forces and Fields*: Electric Charge, Electrostatic Charging; Electric Force; Electric Field; Conductors and Electric Fields; Gauss's Law.
 - *Electric Potential, Energy and Capacitance*: Electric Potential Energy and Electric Potential Difference; Equipotential Surfaces and the Electric Field; Capacitance; Dielectrics.
 - *Electric Current and Resistance*: Batteries and Direct Current; Resistance and Ohm's Law; Electric Power.
 - *Basic Electric Circuits*: Resistances in Series, Parallel and series-Parallel Combinations; Kirchoff's Law, RC Circuits, Ammeters and Voltmeters; Household Circuits.

II. COURSE REQUIREMENTS – To complete this course successfully, students will be required to demonstrate a satisfactory, or higher, level of proficiency in:

- Understand how measurement and problem solving are key components of physics.
- Understanding the kinematics and dynamics of objects in one dimension and two dimensional motion.
- Understand the concepts of force, work, energy and momentum as related to physics.
- Understand how objects move in oscillated and circular motion both accelerated and non-accelerated frames.
- Understand the properties of waves and that they are a transfer of energy in many forms.
- Understand the basics of electricity. Statics, electric fields and circuits.

III. EVALUATION PROCESS – Throughout the length of this course, students will be evaluated on the basis of:

- Tests
- Quizzes
- Lab Reports
- Quarterly