

Course Title	Course Code	Credit Hours
Applied Physics	PHY-114	2-0

Textbooks:

- David Halliday, Robert Resnick, and Jearl Walker, “Fundamentals of Physics”, John Wiley & Sons
- Hugh D. Young, Roger A. Freedman, and Albert L. Ford, “Sears and Zemansky’s University Physics with Modern Physics”, Addison-Wesley

Reference Books/Materials:

- Ben G. Streetman, and Sanjay Kumar Banerjee, “Solid State Electronic Devices”, Pearson Education
- EASA Part-66 Category B1 Maintenance License Module 2, “Physics”
- EASA Part-66 Category B1 Maintenance License Module 3, “Electrical Fundamentals”
- EASA Part-66 Category B1 Maintenance License Module 5, “Digital Techniques / Electronic Instrument Systems”

Course Objectives:

This course aims at making the students:

- Develop basic understanding of fundamental concepts of physics.
- Read and interpret problems related to physical principles and to apply the correct physical principles
- Understand and apply various physics concepts in relation to engineering models, applications and processes.
- Engage in critical analysis of a problem individually and through team effort, effectively communicating your approach to others through assignments/ reports and in-class discussions.

Course Outline:

- Physical Quantities
- Significant Figures
- Dimensional Analysis
- Error Analysis
- Kinematics- Motion along a Straight Line

- Vectors
- Force and Motion
- Friction and its types
- Kinetic Energy and Work
- Work Done by a Constant and Variable Force
- Kinetic Energy and Work-Energy Theorem
- Conservation of Linear Momentum
- Elastic and Inelastic Collisions
- Angular Momentum and Conservation of Angular Momentum
- Motion in 2D-Projectile Motion, Escape Velocity
- The Motion of Planets and Satellites (Kepler's Laws)
- Stress, Strain, Elastic Modulus
- Fluid, Pressure, Pascal's Law and its Applications
- Continuity Equation, Bernoulli's Theorem
- Damped Harmonic Motion, Travelling Waves, Wave Speed on a Stretched String
- Sound Intensity, Sound Level, Sound Power, Audio Frequency, Reverberation, Doppler Effect
- Interference From Thin Films, Single Slit Diffraction
- Polarization of Light, Polarization by Reflection and Brewster's Law, Double Refraction
- Coulomb's Law, Electric and Magnetic Fields, Gauss's Law
- Semiconductor Materials, Energy Bands in Metal
- Semiconductors and Insulators, Direct and Indirect Semiconductors
- Fermi Level
- Hall Effect
- Diffusion Process
- Diffusion and Drift of Carriers (Built-In Fields)
- Zener and Avalanche Breakdown
- Schottky Barrier / Diode
- Fundamentals of Bipolar Junction Transistor
- Advantages and Disadvantages of Fiber Optics