PH-128: APPLIED PHYSICS

Introduction: Types of Errors and Error Calculation, Graphical Techniques.

Vectors: Coordinate System, Review of vectors, vector differentiation (ordinary and partial differentiation), Vector integrations: Line integral.

Mechanics: Motion under constant acceleration, Newton laws and their application, frictional forces, Work and Energy Theorem, Law of conservation of energy, Angular momentum.

Electrostatics and Magnetism: Essential Laws, Electric field around conductor, Magnetic field, Magnetic force on Current, Hall effect, Fields of ring and coil, Magnetic dipole, Diamagnetism, Para magnetism and Ferromagnetism.

Semiconductor Physics: Energy levels in a semiconductor, Hole concept, Intrinsic and Extrinsic regions, Law of Mass Action, P-N junction, Transistor.

Waves and Oscillations: Simple Harmonic Oscillator, Damped Harmonic Oscillation, Forced Oscillation and Resonance, Type of Waves and Superposition Principle, Wave Speed on a stretched string.

Optics and Laser: Huygen's Principle, Two-slit interference, Single-Slit Diffraction, Resolving power of Optical instrument, Principles for laser action, Types of lasers, Applications of laser.

Modern Physics: Planck's explanations of Black Body Radiation, Bohr atomic model, Photoelectric Effect, Compton Effect, Atomic Spectra, Reduced mass, De-Broglie hypothesis, Electron microscope, Atomic Nucleus and Properties of Nucleus, Radioactive Decay and Dating, Nuclear Reactions and Nuclear Reactor

Recommended Books:

Text book(s)

1. D. Halliday, R. Resnick and Krane, "Physics", John Wiley & Sons, volume 1 and 2, 11th ed. 2020.

Reference Book(s)

1. R. A. Serway and J. W. Jewett, "Physics for Scientists and Engineers", Golden Sunburst Series, 10th ed. 2019.