

Course Type	Course Code	Name of Course	L	T	P	Credit
IC	PHP003	Physics - II	3	1	0	11

Course Objective

The students are expected to learn about the fundamentals of physics subject with a special focus on Electricity and Magnetism and Modern Physics, Waves, Thermodynamics and Optics

Learning Outcomes

1. To learn the fundamental laws in Electrostatics and magnetostatics.
2. To understand the origin of electrical current and magnetism
3. To learn about the electromagnetic induction and physics of alternating current
4. To learn about the atomic structure and nuclear physics.

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1.	Electrostatics & Current Electricity: Coulomb's law; Electric field and potential; Electric dipole and dipole moment; Potential and field due to a dipole in end-on and broadside-on positions; potential energy; Torque. Capacitors-Parallel plate, spherical and cylindrical, Potential energy of capacitors; Combination of capacitors. Kirchhoff's laws; Wheatstone's bridge and its sensitivity; E. M. F and internal resistance of a cell. P. O. box; Metre bridge; Carey – Foster's bridge; Potentiometer. Seebeck, Peltier and Thomson's effect; Thermoelectric equation; Thermocouple.	10	To learn the fundamental laws in Electrostatics and magnetostatics.
2.	Magnetostatics & Magnetism: Magnetic effect of current; Biot-savart's law and the tesla; Magnetic field due a straight conductor, circular coil and solenoid; Toroid – Helmholtz Coil; Line integral and Ampere's circuital law. Lorentz force; Force on current-carrying conductor in a magnetic field; Moving coil galvanometer. Current element concept; Magnetic dipole; Diamagnetism, Paramagnetism and Ferro-magnetism; Tangent Law; Magnetometers.	09	To understand the origin of electrical current and magnetism
3.	Electromagnetic Induction & Alternating current: Faraday's and Lenz's laws; Inductance; Mutual and self-inductions; Torque on a current carrying coil; Generator, Transformer, Electric motor. Alternating currents; peak and average values; AC across pure R, pure L and pure C; Phase lag and phase lead; Reactance; AC across L-R, C-R, and L-C-R Circuit; Impedance and impedance diagrams; Electrical resonance; Choke coil; Power and power factor.	09	To learn about the electromagnetic induction and physics of alternating current
4.	Atomic & Nuclear Physics: Bohr's quantization rule; Hydrogen spectrum; Sommerfield's modifications; Introduction to Vector Atom Model. Natural radioactivity; α , β and γ rays and their properties; Rutherford-Soddy formula; Half-life and mean-life; Successive disintegration: Radioactive Series, Mass defect, binding energy and packing fraction; Mass-energy equivalence. Introduction to Nuclear Reactions, Nuclear fission and fusion - Nuclear Reactor.	11	To learn about the atomic structure and nuclear physics.
	Total	42	Plus 14 Tutorials

Text Books:

1. Halliday & Resnick, Fundamentals of Physics (Extended), Wiley
2. H. C. Verma, Concepts of Physics Vol. 1 & 2, Bharati Bhawan Publishers