Course Type	Course Code	Name of Course	L	T	P	Credit
IC	NPHP001	**Physics - I**	3	1	0	4

Course Objective
The students are expected to learn about the fundamentals of physics subject with a special focused on Mechanics, Waves, Thermodynamics and Optics
Learning Outcomes
1. To understand the fundamentals of mechanics and physical properties of matter.
2. To understand fundamentals of waves and oscillations
3. To learn the fundamental laws of thermodynamics
4. To learn about the fundamental on the laws of optics

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1.	**Mechanics and Properties of Matter:** Laws of motion; Collision; Conservation of linear momentum; Motion with variable mass. Circular motion; Brief qualitative idea of motion in a central field; Conservation of angular momentum; work, energy and power; work-energy theorem. Surface tension and surface energy; angle of contact; Pressure inside a bubble; Experimental determination of surface tension. Viscosity: Streamline and turbulent flow; Critical velocity and Reynold's number; Terminal velocity and Stokes' law, Poiseiulle's equation; Experimental determination of the co-efficient of viscosity, Hydrodynamics; Equation of continuity; Bernoulli's principle and its applications; Velocity of efflux.	13	To understand the fundamentals of mechanics and physical properties of matter.
2.	**Waves & Oscillations:** Simple harmonic motion; Simple pendulum; Vibration of springs; Damped vibration, forced vibration and resonance (qualitative discussions only). Transverse and longitudinal wave, phase velocity and group velocity, Superposition principle, Interference, beats and standing waves. Transverse vibration of strings; Formation of stationary waves. Propagation of sound through gaseous and solid media; speed of propagation: Newton formula; Laplace's correction; Effect of pressure, temperature and humidity. Vibrations of air columns; closed and open organ pipes. Doppler effect.	13	To understand fundamentals of waves and oscillations
3.	**Kinetic Theory of Gases and Thermodynamics:** Pressure of a perfect gas; Kinetic interpretation of temperature; Equation of state for an ideal gas; Mean-free path; Vander waal's equation. Thermal equilibrium; Thermodynamic systems; Zeroth law of Thermodynamics; Isothermal and adiabatic processes; Internal energy; Specific heats of gases.	08	To learn the fundamental laws of thermodynamics
4.	**Geometrical and Wave Optics:** Refraction of light through prism, Angle of minimum deviation; Dispersion; Dispersion without Deviation and deviation without Dispersion; Refraction through spherical surfaces; Lenses; Lens makers' formula; Conjugate foci relation; Magnification; Combination of lenses. Huygens' principle – reflection and refraction; Interference; Diffraction (Qualitative idea) Young's double- slit experiment; Fresnel's Biprism; Newton's rings.	08	To learn about the fundamental on the laws of optics
	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