**SYLLABUS FOR THE SUBJECT OF PHYSICS**

**Paper -1**

**Total Marks: 100**

**Mechanics**

Vectors -Dots, Cross and triple products, Gradient, divergence and applications. Curl of

a vector field; Gauss's Theorem; Stokes theorem

Newtonian laws of motion; motion of charged particles in electric and magnetic fields;

Motion in a circle, Law of conservation of energy; Conservation of linear and angular

momentum; Dynamics of rigid body; spin and precession; gyroscope; Gravitation;

planetary motion including satellite work energy theorem.

Special theory of relativity. Mischelson - Morley experiment, Einstein's postulates;

Lorentz transformation; time dilation, length contraction; equivalence of mass and

energy.

**Fluid Mechanics**

Surface tension; Viscosity; elasticity; fluid motion and Bernoulli's theorem.

**Waves and Oscillation**

Free oscillation with one and two degrees of freedom; free and forced oscillations,

Lissagous figure, Coupled oscillations, Travelling waves and transmission of energy;

Phase and Group velocity; Standing waves Longitudinal waves.

Reflection, Refraction, Interference, Diffraction and Polarization of waves; interferometer

and Newton's rings; Diffraction Gratings and their resolving power;

Spectrometers. Electromagnetic wave equation; Normal and anamolous dispersion;

Coherence, lasers and its application.

**Heat and Thermodynamics**

Perfect gas and Vander Waals equation; Three Laws of Thermodynamics; Entropy,

entropy of an ideal gas; Helmbroltz function, Gibbs function; Maxwell's equations;

Enthalpy, Thermal properties of Simple system; Production and measurement of low

temperatures; Kinetic theory of gases; Maxwellian distribution of molecular velocities;

Brownian motion; Transport phenomena. Classical Maxwell-Boltzmann Statistics and its

applications, Quantum Bose-Einstein and Fermi-Dirac Statistics.