

Syllabus for the entrance test: M. Sc. Physics

•**Vector calculus:** Coordinate systems in two and three dimensions, Dot product, Cross product, Gradient, Divergence, Curl, Line integral, Surface integral, Volume integral.

•**Classical Mechanics:** Kinematics, Force, Momentum, Work and Energy, Collisions in Center-of-mass frame, Angular momentum, Torque, Rigid body motion, Central force motion, Harmonic oscillator, and Non-inertial Frame Of Reference.

•**Electrodynamics:** Basic concepts of electrostatics, Gauss's law and its application, basic concepts of magnetostatics, electromotive force, Faraday's law, Maxwell's equations, Electromagnetic waves.

•**Quantum Mechanics:** Wave particle duality, Photoelectric effect, Black body radiation, Compton effect, Concepts of wave packets, Heisenberg uncertainty principle and its application, wave function, Time dependent and independent Schrödinger equation and its application in one dimension.

•**Heat and Thermodynamics:** Thermodynamic properties, Energy, work, heat, laws of thermodynamics and their applications.

•**Special Theory of Relativity:** Michelson Morley Experiment, Lorentz Transformations, Time Dilation and Length contraction.

•**Solid State Physics:** Crystal binding, Crystal structure, Electrical, thermal and optical properties of solid.

•**Optics:** Wave equation, Plane waves, Electromagnetic waves, Standing waves, Interference, Diffraction, Lasers