

First year of Five Years integrated M.Sc. (Physics / Chemistry / Mathematics)**M.Sc. - I, Semester – I****MP 101 : Physics – I**

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- **VECTORS FUNDAMENTALS AND DIFFERENT CO-ORDINATE SYSTEM** (08 Hours)
Unit Vectors, Vector Operations, Tripple Products, Vector Algebra in component form, Differential Calculus, Cartesian Coordinate System, Spherical Coordinate System, Cylindrical Coordinate System.
 - **NEWTON'S LAWS OF MOTION, CONSERVATION LAWS, MOMENTS OF INERTIA.** (10 Hours)
Mechanics of the particle, Equation of motion, Different conservation laws, Moments of inertia, Motion in central force field.
 - **RIGID BODY MOTION** (06 Hours)
Euler's theorem, Angular momentum and kinetic energy, Euler's equation of motion, Euler's angles.
 - **ELASTICITY & HYDRODYNAMICS** (08 Hours)
Stress and Strain, Young's modulus, Shear modulus and Bulk Modulus, Buoyancy, Types of fluid flow, Bernoulli's equations.
Viscosity, Terminal Velocity,
 - **SIMPLE HARMONIC MOTION** (04 Hours)
Restoring force, Elastic potential energy, Period and frequency, Energy, Pendulums, Applications of SHM.
 - **OSCILLATIONS** (08 Hours)
Damped oscillations, forced oscillations, coupled oscillations & resonance.

(Total Contact Time (Theory) : 44 Hours)

BOOKS RECOMMENDED :

1. **Mathur D. S.**, *Mechanics* , S. Chand & Company, 2000.
2. **Takwale R. G. & Puranik P.S.** *Introduction to Classical Mechanics*, TMH., 1997.
3. **Feymann R. P., Lighton R. B. and Sands M.**: *The Feymann Lectures in Physics Vol. 1* Narosa Publishers, 2008.
4. **Verma H. C.**, *Concepts of Physics, Vol. 1 & 2*, Bharati Bhavan, 2007.
5. **Landau L. D. & Lifshitz E M**, *Course on Theoretical Physics, Vol. 1: Mechanics*, Addison-Wesley, 2002