Second year of Five Years integrated M.Sc. (Mathematics)
M.Sc.-II, Semester-III   **L   T   P   C**

MS 201: BASIC SCIENCE ELECTIVE(BSE)   **3   0   0   3**
      FUNDAMENTALS OF CLASSICAL MECHANICS

- **MECHANICS OF A PARTICLE AND SYSTEM OF PARTICLES**   **(10 Hours)**
  Equation of motion, Different conservation laws, Constrained motion,
  Constraints, Degree of freedom, Generalized coordinates.
- **VARIATIONAL PRINCIPLE AND LAGRANGIAN FORMULATIONS**   **(10 Hours)**
  Calculus of variations, Variational technique for many independent variables,
  Euler Lgrangian differential equation

- **HAMILTONIAN FORMULATION OF MECHANICS**   **(10 Hours)**
  Phase space and motion of the system, Hamilton's canonical equation of motion, Physical
  significance of H, Advantage of Hamilton approach.

- **SPECIAL THEORY OF RELATIVITY**   **(06 Hours)**
  Frames of Reference, Postulates, Time dilation, Length contraction,
  Mass-Energy Relation, Lorentz' transformation.

- **GENERAL THEORY OF RELATIVITY**   (**08 Hours)**
  Space-time Fabric, Pinciple of equivalence, Euclidean and non−Euclidean Continuum

(Total Contact Hours (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