

Course-II: CLASSICAL MECHANICS

Block-1

Mechanics of a system of particles, The energy equation and the total potential energy of a system of particles, The Lagrangian method, Applications of Lagrangian method

Block-2:

Motion of a particle in a central force field, Hamilton's equations, Canonical transformations, Poisson brackets

Block-3:

The Hamilton -Jacobi equation, Mechanics of rigid bodies, Moment of inertia tensor
Torque free motion of a rigid body

Block-4:

Relativistic mechanics of a material particle, Determination of the fourth component of the 4-force along the world-line of the particle, Einstein's equations, Gravitation as space time curvature, gravitational field equations of Einstein and its Newtonian limits

References:

1. Goldstein H, Poole C and Safko J, - Classical Mechanics; 3rd edition, Pearson Education, New Delhi, 2002.
2. Upadhaya J.C, - Classical Mechanics; 5th edition, Himalaya Publishing House, Mumbai, 2013.
3. Srinivasa Rao K. N, - Classical Mechanics; 1st edition, Universities Press, Hyderabad, 2003.
4. Takwale R.G. and Puranik S, - Introduction to Classical Mechanics; 1st edition, Tata McGraw, New Delhi, 1980.
5. Landau L.D. and Lifshitz E.M., -Mechanics, 4th edition, Butterworth –Heinemann Publications, Oxford, 1985.