

SYLLABUS :-

Brief survey of the Newtonian Mechanics: conservation theorems and symmetry properties, inertial and non-inertial frames of reference, pseudo forces, Coriolis force. Lagrangian and Hamiltonian Mechanics: generalized coordinates, constraints, principle of least action, Lagrangian equations of motion, Lagrange multipliers and applications, Hamiltons canonical equations of motion, Rouths procedure, canonical transformations, Poisson brackets and equations of motion. The central force problem: Keplers laws, Laplace-Runge-Lenz vector, scattering in a central force field. Rigid body dynamics: infinitesimal and finite rotations, angular momentum, moment of inertia tensor, torque-free motion of a rigid body, Eulers angles, Eulers equations of motion, heavy symmetrical top. Small oscillations: normal coordinates and normal modes.