

SYLLABUS :-

Kinematics of particles: representation of motion of particles in various coordinate systems, relative motion in translating frames, constrained motion. Kinetics of particles: Concept of an inertial frame and Newtons second law, equations of motion for unconstrained and constrained motion, work-energy relation, conservation of energy, conservative and non-conservative forces, potential energy, impulse-momentum relation, angular momentum, conservation of momentum, d'Alemberts principle. Applications: central force motion, impact. Kinetics of a system of particles: Newtons second law, work-energy relation, impulse-momentum relations, conservation laws, steady and variable mass flow systems. Plane kinematics of rigid bodies: Kinematics of rigid bodies, instantaneous center of rotation, kinematics in rotating frames and relative motion. Plane kinetics of rigid bodies: Linear and angular momentum, equations of motion, work-energy relation, impulse-momentum relation, conservation laws. Introduction to spatial dynamics of rigid bodies: Kinematics in rotating frames and relative motion, angular momentum, kinetic energy, equations of motion, special cases of parallel-plane motion, and gyroscopic motion.