

ENGINEERING MECHANICS – II

Lectures/Tutorials : 4/1 Periods / week

Sessional marks : 40

Semester End Exam. : 3 hours

Semester End Exam. marks : 60

Credits : 4

Course Objectives:

- To study rectilinear translation
- To study curvilinear translation
- To understand rotation of rotation of a rigid body
- To determine moments of inertia of material bodies and plane figures

Course Outcomes:

- Solve problems involving rectilinear translation
- Solve problems involving curvilinear translation
- Understands rotation of a rigid body
- Calculates moments of inertia of material bodies and plane figures

Unit-I

Rectilinear Translation

Kinematics of rectilinear motion ; Principles of dynamics ; Differential equation of rectilinear motion ; Motion of a particle acted upon by a constant force ; D'Alemberts principle ; Momentum and impulse ; Work and energy ; Ideal systems – conservation of energy ; direct central impact

Unit-II

Curvilinear Translation

Kinematics of curvilinear motion ; Differential equations of curvilinear motion ; D'Alembert's principle in curvilinear motion ; Work and Energy.

Unit-III

Moments of Inertia of Material Bodies

Moment of inertia of a rigid body; Moment of inertia of a lamina; Moments of inertia of three-dimensional bodies.

Rotation of a Rigid Body about a Fixed Axis

Kinematics of rotation ; Equation of motion for a rigid body rotating about a fixed axis; Rotation under the action of constant moment, D'Alembert's principle, Work and energy

Unit-IV

Moments of Inertia of Plane Figures

Moment of inertia of a plane figure with respect to an axis in its plane ; Moment of Inertia with respect to an axis perpendicular to the plane of the figure ; Parallel axis theorem.

TEXT BOOK:

- 1 Engineering mechanics by S. Timoshenko , D. H. Young and J. Rao , Tata McGraw Hill Publishing Company Ltd., 2007.

REFERENCE BOOK:

1. Engineering mechanics by J. L. Meriam and L. Kraige ,6th Edition, John Wiley & Sons,2010.

