

13-ES106 ENGINEERING MECHANICS

SYLLABUS:

Force systems: Introduction, Forces acting at a point, Moment of a force about a point and about an axis, Couple moment, General case of forces in a plane.

Equilibrium of force system: Free body diagram, Equilibrium of a two-force and three force body in a plane, Analysis of trusses by method of joints and sections.

Force systems in space (Vector approach), forces in space-Resultant

Friction: Laws of Coulomb friction, problems involving dry friction, wedge friction.

Properties of areas: Centroid and Centre of gravity, Moments of inertia of an area, polar moment of inertia, Mass moment of inertia.

Virtual work: Principle, Potential energy and equilibrium, stability.

General principles of Dynamics: Kinematics of Rectilinear, Curvilinear and Rotary motion of a particle.

Kinetics of Rectilinear, Curvilinear and Rotary motion of a rigid body in a plane.

D'Alembert's principle- Motion of the mass center, Momentum and Impulse,

Work and energy methods, plane motion.

TEXT BOOKS:

1. "Vector Mechanics for Engineers (in SI units) Statics & Dynamics" by F.P. Beer and E.R. Johnston – Mc Graw Hill Publications.

2. "Engineering Mechanics Statics & Dynamics" by Singer – B S Publications.

3. "Engineering Mechanics" by S.Timoshenko, D.H.Young, J.V.Rao McGraw hill companies. Fourth edition.

REFERENCE BOOK:

1. "Engineering Mechanics Statics & Dynamics" by R.C.Hibbeler – Pearson Publications