Department of Civil Engineering xCE101 Engineering Mechanics

L-T-P-Cr: 3-1-0-4

Module -I 1. Statics: Force systems: Moment of a force about a point and about an axis; Equivalent forces and moment, Wrench. [6 Lectures]

2. Equilibrium: Free body diagram; equations of equilibrium; problems in two and three dimensions; Supports and reactions [3 Lectures]

3. Method of sections for evaluating internal forces in bodies; axial force, shear and bending moment diagrams: [3 Lectures]

4. Trusses and frames [3 Lectures]

Module –II 5. Friction: Laws of Coulomb friction, impending motion problems involving large and small contact surfaces [3 Lectures]

6. Principle of virtual work [3 Lectures]

Module - III 7. Dynamics: Kinematics and Kinetics of particles: Particle dynamics in rectangular coordinates cylindrical coordinates and in terms of path variables. [4 Lectures]

8. Kinematics and Kinetics of rigid bodies: Chasle‘s Theorem; General Plane motion; D’ Alembert’s Principal, Work & Energy and Impulse Momentum methods, Impact. [6 Lectures]

Module - IV 9. Simple Stress and Strain, Hook’s Law [2 Lectures]

10. Analysis of stresses, Equilibrium Equations, Generalized Hook’s Law, Elastic constants [3 Lectures]

11. Analysis of strains, Normal and Shear Strains, Volumetric Strain [3 Lectures]

12. Axially loaded members [3 Lectures]

Suggested Readings: 1. Shames, Engineering Mechanics Pearson‘s Education. 2. Beer, F.P. and Johnston, Mechanics for Engineers, Tata McGraw Hill, New Delhi 3. Meriam, Engineering Mechanics, Wiley Pub. 2. R .C. Hibbler, Engineering Mechanics, 3. Timoshenko and Gere, Mechanics of Solids, McGraw Hill Inc 4. E.P. Popov, Mechanics of Solids, Pearson Education pub. 5. Engineering Mechanics, Timoshenko, McGraw Hill Inc.