

**Course Title:** Mechanics of Solids

**Course Code:** CE-212

**Course Contents**

Different Stress States; Uniaxial state of stresses & strains; relationship between elastic constants; Responses of materials under different sets of monotonic loading; normal & shearing stress & strains; Gradually & suddenly applied loads; Distributions of direct stress on uniform & non-uniform members; thermal stresses & strain. Bending Theory; theory simple bending, position of neutral axis, moment of resistance and section modulus; bending & shearing stress distribution in beams; Relationship between load, shear force & bending moment; stresses in composite sections; curvature, slope & deflections of beams using integration methods. Biaxial State of Stress; biaxial state of stresses, resolution of stresses principal plane, principal stresses & strains; graphical representation of stresses & strain, Mohr's circle of stresses & strains. Theory of Torsion; theory of torsion of solid & hollow circular shafts, shearing stress distribution & angle of twist, strength & stiffness of shaft. Cylinders; analysis of thin & thick cylinders. Stability; struts & columns; euler, Rankin & other formula for bucking load of columns; stability analysis of columns under eccentric loading.

**TEXTBOOKS**

1. Mechanics of Materials 6th Edition (2004) By James M. Gere
2. Simplified Mechanics & Strength of Materials 6th Edition By James Ambrose
3. Mechanics of Materials 4th Edition (2011) By James M. Gere and Timoshenko