

ME 212 Solid Mechanics - I (2-1-0-6)

Prerequisite: ME 101 Engineering Mechanics or equivalent

Analysis of stresses in solids: 3D state of stress at a point, principal stresses, Mohr's circle representation, analysis of deformation of solids: 3D state of strains, principal strains; constitutive relations for isotropic materials, theories of failure for isotropic materials, axially loaded members, shear force and bending moment diagrams, stresses due to bending of beam elements, torsion of circular shafts, combined stresses in beam elements due to bending, torsion and axial loads, deflection of beam elements, stresses in thin cylinders and pressure vessels, buckling of columns.

Texts:

- [1] E. P. Popov, Engineering Mechanics of Solids, Prentice Hall, 1998.
- [2] F. P. Beer, E. R. Johnston (Jr.) and J.T. DeWolf, Mechanics of Materials, Tata McGraw Hill, 2005.

References:

- [1] S. H. Crandall, N. C. Dahl, and T. J. Lardner, An Introduction to The Mechanics Of Solids, 2nd Ed., Tata McGraw Hill, 2008.
- [2] S. P. Timoshenko, Strength of Materials, Vols. 1 & 2, CBS Publishers, 1986.
- [3] H. Shames and J. M. Pitarresi, Introduction to Solid Mechanics, Prentice Hall of India, 2003.
- [4] J. M. Gere, Mechanics of Materials, Thomson Brooks/Cole, 2006.