

ME 222
MECHANICS OF DEFORMABLE SOLIDS
Fall 2005 SEMESTER

COURSE DESCRIPTION:

Tension, compression and shear stresses. Axially loaded bars. Torsion of circular shafts. Beam theory. Combined stresses. Mohr's circles. Columns.

LEARNING OBJECTIVES:

1. Calculate stress (normal and shear) in a structure or machine component loaded in various ways
2. Use stress concentration factors to find stresses in, or allowable loads on, axially loaded members
3. Calculate normal and shearing strains/deformations for bodies subjected to loads and/or temperature changes
4. Design members using criteria based on strength and/or deformation
5. Solve statically indeterminate problems subjected to one or a combination of axial, torsion and bending loads
6. Apply Hooke's Law in one, two and three dimensions
7. Determine stresses and/or deformations in a circular member subjected to torsional loading
8. Solve problems using stress transformation equations and Mohr's circle
9. Calculate stresses in thin-walled pressure vessels
10. Solve problems using plane strain transformation equations and Mohr's circle for plane strain
11. Measurements of strain, strain rosette
12. Draw shear and moment diagrams for beams subjected to some combination of concentrated loads, distributed loads and concentrated moments
13. Calculate normal and shearing stresses in beams
14. Determine the deflections of statically determinate and indeterminate beams using double integration and superposition
15. Apply Euler's equation to solve buckling problems for various end conditions