

ME 566 ADVANCED MECHANICS OF MATERIALS

Spring 2014

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1:00 ~ 1:50 MWF, ENGR A208

Office Hours: 11-12 & 2-3 MW & 10-12 T

OBJECTIVES: The primary objective of this course is to provide graduate students in Mechanical Engineering with a sound analytical basis for studying in solid mechanics. This course will develop many of the concepts used in structural mechanics and in mechanical systems design.

COURSE DESCRIPTION: Advanced topics in Mechanics of Materials including: elasticity equations, generalized bending such as curved beams and elastic foundations, shear center, failure criteria, thick and thin walled bodies, contact stresses, and stress concentrations. Numerical method such as FEA may be used to investigate some problems.

OUTLINE:

- Introduction and Overview of Mechanics of Materials
- Theories of Stress and Strain
- Failure Criteria
- Torsion and Elastic Film Analogy
- Nonsymmetrical Bending
- *Curved Beams*
- Shear Center
- *Beams on Elastic Foundation*
- Thick-walled Cylinder
- *Elastic and Inelastic Stability of Columns*
- *Stress Concentration and Contact Stress*
- *Fatigue*
- *Fracture Mechanics*

PREREQUISITES: ME/CEE/ENGR 350A & ENGR 222.

TEXT: *Advanced Mechanics of Materials*, 6th ed./Boresi, Schmidt & Sidebottom

REFERENCE: *Advanced Mechanics of Materials*/Cook & Young
Mechanics of Materials/Gere & Timosheko
Foundation of Solid Mechanics/Fung

ASSIGNMENTS & TESTS:

tests (3):60%
final exam:40%

GRADE DISTRIBUTION: 90 & above: A, 80~89.9: B, 70~79.9: C, 60~69.9: D, Below 60: F

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