ME 322 Mechanics of Solids II 3(3-0-6)

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Course description: This course contains the advanced topics about mechanics of solids as shown in the followings:

- Deflection of composite beams, variable cross sectional beams and curved beams
- Mohr's circle (application)
- Analysis of beam deflection by energy method
- Asymmetric bending
- Torsion of non-circular cross sectional members
- Torsion of thin-walled cylinder of opened and closed sections
- Stress in thick walled cylinders and rotating disc
- Analysis of statically indeterminate beams and structures by superposition and energy methods
- Theories of failure for static and repeated loads
- Introduction to theories of elasticity

Teaching schedule

Week	Date	Topic
1	14/06	Introductions
2	19/06	Symmetry of stress, Plane stress, Mohr's circle
3	21/06	Strain theory, Small-displacement theory
4	26/06	Hooke's law
5	28/06	Thermoelasticity for isotropic material
6	3/07	Uniaxial Stress-Strain data, Yield criteria
7	5/07	Yielding of ductile metals, General yielding
8	12/07	Principle of stationary potential energy, Castigliano's theorem on deflections
9	17/07	Castigliano's theorem on deflections
10	19/07	Deflections of statically determinate structures
11	24/07	Torsion of a prismatic bar of circular cross section
12	26/07	Linear elastic solution
13	31/07	Narrow rectangular cross section
14	2/08	Hollow thin-wall torsion members
15	7/08	Questions
16	Midterm-Exam	Midterm-Exam
17	21/08	Fundamental of beam bending
18	23/08	Nonsymmetrical bending in beams
19	28/08	Shear center for thin-wall beam cross sections
20	30/08	Circumferential / Radial stresses in curved beams
21	4/09	Deflections of curved beams
22	6/09	Concentrated / Plastic loads for curved beams
23	11/09	Thick-wall cylinder: basic relation and stress components
24	13/09	Stress components and radial displacement (const. temp.)

25	18/09	Rotating disks of constant thickness
26	20/09	Introduction / Kinematics / Strain energy for a plate
27	25/09	Boundary conditions for plates and rectangular plate prob.
28	27/09	Circular plate problems
29	2/10	Questions

Assessment

Assignments	**15% (2 persons for one group)**
Attendance	**10% (after 20 mins: -1%)**
Midterm	**35%**
Final	**40%**

Reference

A. P. Boresi and R. J. Schmidt. Advanced Mechanics of Materials, sixth edition, John Wiley & Sons, Inc. (ISBN 0-471-43881-2)