

WASHINGTON UNIVERSITY SPRING 2010
JME 2410
Mechanics of Deformable Bodies
SYLLABUS (Updated 03/11/2010)

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Textbook: Mechanics of Materials, F. P. Beer, E. R. Russell Johnston & J. T. DeWolf. Fifth Edition, McGraw Hill, Inc. 2006 (ISBN 0-07-298090-7)

Web site: <http://classes.engineering.wustl.edu/jme2140/>

Lectures: Monday & Wednesday 5:30pm to 7:00pm (room Cupples II 202)

Instructor Help Sessions: Monday & Wednesday 7:00pm to 8:00pm (room Cupples II 200)

Regular attendance is strongly recommended.

Tests- Quizzes: (Mondays, room Cupples II 202) closed notes and closed book.

Midterm: (3/3/10) one 8.5 x 11 cheat sheet is allowed with formulas only.

Final exam: (5/12/10) open book plus one 8.5 x 11 cheat sheet.

Grading: Homework & quizzes (40%), midterm (30%), final exam (30%).

60-69 (D); 70-79 (C); 80-89 (B); 90-100 (A).

Homework: 13 problem sets as shown below.

For those homework problems for which a quiz is indicated, one of the assigned problems will be used for the quiz. Only homework 1 will be collected for grading.

HW #	Due/Test date	Problems	Quiz #
1	1/27	Review problems: statics	N/A (*)
2	2/01	1.4, 1.16, 1.27, 1.29, 1.39, 1.51	Quiz 1
3	2/08	2.12, 2.16, 2.22, 2.39, 2.46, 2.60	Quiz 2
4	2/15	2.63, 2.67, 2.70, 2.77, 2.93, 2.96	Quiz 3
5	2/22	3.9, 3.17, 3.23, 3.33, 3.47, 3.56	Quiz 4
6	3/15	3.66, 3.76, 3.83, 3.84, 3.126, 3.136	Quiz 5
7	3/22	4.13, 4.16, 4.21, 4.39, 4.50, 4.66	Quiz 6
8	3/29	4.101, 4.116, 4.120, 4.123, 4.133, 4.144	Quiz 7
9	4/05	5.8, 5.20, 5.43, 5.59, 5.80, 5.148	Quiz 8
10	4/12	6.3, 6.12, 6.24, 6.32, 6.36, 6.44	Quiz 9
11	4/19	6.62, 6.78, 7.4, 7.9, 7.22, 7.23	Quiz 10
12	4/26	7.34, 7.46, 7.54, 7.69, 7.87, 7.91	Quiz 11
13	5/03	7.105, 7.118, 8.3, 8.33, 8.39, 8.51	Quiz 12
(*) Homework 1 should be turned in at the end of class on 1/27.			

Week	Lecture	Date	Reading	Description
1	1	1/20	1.1-1.10	Introduction. The concept of stress
2	2	1/25	1.11-1.13	Oblique plane; Components of stress; FS
	3	1/27	2.1-2.8	Stress-strain diagram for axial loading
3	4	2/01	2.9-2.10	Statically indeterminacy, temperature
	5	2/03	2.11-2.13	Generalized Hooke's law
4	6	2/08	2.14-2.18	Elastic constants, stress concentration
	7	2/10	3.1-3.4	Torsion: strain/stress. Solid/hollow shafts
5	8	2/15	3.5-3.6	Angle of twist; Redundant constraints
	9	2/17	3.7-3.8	Transmission shafts; SCF
6	10	2/22	3.12-3.13	Torsion of non-circular members
	11	2/24	4.1-4.4	Pure bending: Stress and strain
7	-	3/3	Sections 1.1 to 4.4 (lectures 1-11)	Midterm exam (85 min.)
		3/8-3/12	Spring break	
8	12	3/15	4.5-4.7	Beam of multiple materials; SCF
	13	3/17	4.12-4.14	Eccentric loading; Unsymmetrical bending
9	14	3/22	5.1-5.3	Design of prismatic beams
	15	3/24	5.4 & 5.6	Non-prismatic beams
11	16	3/29	6.1-6.4	Transverse loading: Shear stresses
	17	3/31	6.6-6.7 & 6.9	Thin-walled members; Shear center
12	18	4/05	7.1-7.3	Stress transformation - plane stress
	19	4/07	7.4-7.6	Mohr's circle of stresses
13	20	4/12	7.7-7.8	Yield criteria; Fracture criteria
	21	4/14	7.9	Thin-walled pressure vessels
14	22	4/19	8.1, 8.2, 8.4	Combined loading
	23	4/21	9.1-9.3	Deflection of beams
15	24	4/26	9.5, 9.7, 9.8	Statically indeterminate beams; Superposition
	25	4/28	10.1-10.4	Columns: Euler formula
16	26	5/3	3.10-3.11, 4.9-4.11	Plasticity in shafts/beams
-	5/12		ALL	Final Exam (5:30pm - 7:30pm)