ME 305
Mechanics of Materials
Section A1, Spring 2011
Course Information

Instructors:

Allan D. Pierce; Lecture: TTh 8–10 am, Pho 211
Office: ENG 401. Phone: (508) 833-0193, 3-4841. adp@bu.edu
Office Hours: ordinarily T 10–12, Th 10–12, F 8-10, or as announced

Elizabeth Peruski, GTF; Recitation section: to be arranged
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Monika Mathur , Grader
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Text:

- Crandall, Dahl, and Lardner, *Introduction to the Mechanics of Solids, second edition with SI units*

- Various handouts posted on the Blackboard site, reached via

  http://blackboard.bu.edu/

  After logging in, this should give you access to all the courses you are taking which are on Blackboard. Ours is ME 305 A1.

Supplementary text:

- Nash, *Strength of Materials, Fourth Edition* (Schaum's Outline Series)

  This is not a required purchase, but it is a good source of solved problems, and is relatively inexpensive.

Mechanics of Materials Laboratory:

- 15 St. Mary street, room 308. There will be 3 laboratory exercises, each of roughly three hours duration, occurring at intervals of one to two weeks during the term. Students will participate in groups of between 6 to 10 students, and possible times will be posted by the laboratory teaching staff.

Hardware and Software Requirements:

Access to a scientific calculator
Access to a computer with either *MatLab* or *Octave* installed

Syllabus:

See attached; some topics are not included in the text.

Grading:

Class attendance	15%	Promptness	10%
Homework	30%	Class attentiveness	10%
Labs	10%	Exams	25%

- The Laboratory Exercises, with written reports, are *mandatory*. No passing grade will be given unless these are completed. Any projects assigned will be regarded as part of the homework, and may be weighted as equal to more than one homework set.

Course prerequisites:

- high school plane geometry, algebra I and II, trigonometry
- MA 123 (Calculus I), MA 124 (Calculus II), MA 225 (Multivariate Calculus), Py 211 (Physics I), EK 301 (Engineering Mechanics I). Completion of MA 226 (Differential equations) is recommended, but it is sufficient that one be taking it at the same time as the present course.
- It is also recommended that one has completed EK 126 (Engineering Computation), CH 131 (General Chemistry).
- ME 306 (Materials Science) is a highly recommended as something either to take prior to ME 305 or simultaneously with ME 305.

Week	Date	Lecture Topic	Comments	Reading
1	Tues 1/18	Stress	First class	4.2, 4.3
	Thurs 1/20	Uniaxial loading, elastic modulus		2.2, 2.3, 5.2
2	Tues 1/25	Trusses, elastic energy		2.4, 2.6, 4.4
	Thurs 1/27	Castigliano, stress components		4.5
3	Mon 1/31		Enrollment deadline	
	Tues 2/1	Shear force, bending moment		3.2, 3.3
	Thurs 2/3	Mohr's circle for stress		4.6, 4.7
4	Tues 2/8	Slender members		3.4, 3.5
	Thurs 2/10	Strain tensor		4.8, 4.9
5	Tues 2/15	Stress-strain relations		5.4
	Thurs 2/17	Beams		7.2–7.4
6	Mon 2/21	BU Holiday		
	Tues 2/22	No class	Drop without a W	
	Thurs 2/24	Quiz		
7	Tues 3/1	Stresses in beams		7.6, 7.7
	Thurs 3/3	Unsymmetrical beams		7.11, 7.12
8	Tues 3/8	Beam differential equations		8.1–8.3
	Thurs 3/10	Energy in beams		8.6
9	Tues 3/15	No class	Spring recess	
	Thurs 3/17	No class	Spring recess	
10	Tues 3/22	Superposition		8.4
	Thurs 3/24	Buckling		9.4
11	Tues 3/29	Radial stresses		5.7
	Thurs 3/31	Quiz		
	Fri 4/1		Last drop date	
12	Tues 4/5	Torsion, circular cylinders		6.2–6.5
	Thurs 4/7	Torsion, thin walls		6.14
13	Tues 4/12	Stress concentrations		5.9
	Thurs 4/14	Plasticity		5.11, 5.12
14	Mon 4/18	BU Holiday		
	Tues 4/19	Combined loadings		7.6–7.12
	Thurs 4/21	No class	Monday Classes	
15	Tues 5/3	Failure criteria		5.9
	Thurs 5/5	Review	Last Class	
16	Wed 5/11	Final Exam	12:30–2:30	