Engineering Science and Mechanics 2204 – Fall 2013
Mechanics of Deformable Bodies
CRN: 93235

Lecture:
Tu Th 3:30-4:45 PM, Surge 104D

Professor:
Dan Dudek
Office Hours: W and F, 11-12, 318 Norris Hall
If my door is open, feel free to stop and ask questions at other times (I might ask you to come back later if I am really busy)
e-mail: dmdudek@vt.edu; phone: 231-0687

Graduate Student Instructor
Mohammad Habibi
Office Hours: Tu Th, 1-5 pm, 306 Norris Hall
e-mail: mhabibi@vt.edu

A GSI will be in 306 Norris Hall for help every day from 1-6 pm (only until 5 pm Friday)

Text:

Prerequisites:
ESM 2104 STATICS, MATH 2224 MULTIVARIABLE CALCULUS. Students who do not have the prerequisite will be dropped from the class roll. No exceptions!

Learning Objectives:
a. Calculate stresses (normal, shearing, bearing) in a structure or machine component under various loading conditions
b. Use stress concentration factors to find stresses in, or allowable loads on, axially loaded members
c. Calculate normal and shearing strains/deformations for bodies subjected to loads and/or temperature changes
d. Design members using criteria based on strength and/or deformation
e. Solve statically indeterminate problems subjected to one or a combination of axial, torsion and bending loads
f. Apply Hooke's Law in one, two, and three dimensions
g. Determine stresses and/or deformations in a circular member subjected to torsional loading
h. Solve problems using stress transformation equations and Mohr’s circle
i. Calculate stresses in thin-walled pressure vessels
j. Draw shear and moment diagrams for beams subjected to some combination of concentrated loads, distributed loads, and concentrated moments.
k. Calculate normal and shearing stresses in beams
l. Determine the deflections of statically determinate and indeterminate beams using double integration and superposition
m. Apply Euler's equation to solve buckling problems for various end conditions
Grading:
Your grade will be determined by a combination of weekly homework assignments, three midterm exams, and a final exam. Exams will cover material from the lectures, homeworks, and assigned readings. Exams will be given on the dates shown below. Please manage your time to take these tests on these dates as no makeup tests or exams will be given. Course grades will be determined in the following way:

**Homework** (15%) – The homework exercises have problems to solve and questions to answer, so that you can make sure that you understand the material as we go along and can get help right away if you don’t. The homework for each week will be posted on Tuesday after lecture and will be due the following Tuesday before 4:45 PM either as a printed copy in the GSI mailbox or electronically in the Scholar dropbox. The answer key will be posted on Tuesday evening on the course Scholar site. No late homework will be accepted.

The lowest two homework grades will be dropped. This is to allow for circumstances where one did not have enough time (for one reason or another) to solve a particular homework. Again, it is important to solve the homework even if you could not submit it on time and its grade might be dropped.

**Midterm Exams** (60%) – Exams will be given on the dates shown on the attached course outline. Please manage your time to take these tests on these dates as no makeup tests or exam will be given. Unlike the number of homeworks, the number of tests is limited, so no tests or Exam grades will be dropped.

- **Midterm Exam #1**: Given on **September 26** will be 20% of total grade; covering lecture material from August 27 through (i.e. including) September 19.
- **Midterm Exam #2**: Given on **October 24** will be 20% of total grade; covering lecture material from September 24 through (i.e. including) October 17.
- **Midterm Exam #3**: Given on **November 21** will be 20% of total grade; covering lecture material from October 22 through (i.e. including) November 14.

**Final Exam** (25%) – The Mechanics of Deformable Bodies Final Exam is a common exam, given at a common time, for all students taking this course. The common-time final is scheduled for **7:45 a.m. – 9:45 a.m., Thursday, December 19, 2013.** (Classroom assignments for the common-time final will be posted at a later date.)

**Important Dates:**
- **August 30, 2013**  Last day for students to add classes and to add or drop audit option
- **October 4, 2013**  Last day for students to drop Fall 2013 classes without grade penalty
- **October 21, 2013**  Last day to resign without grade penalty

**Special Needs:** It is the responsibility of students with disabilities to provide the instructor with forms requesting accommodations at least 2 weeks in advance of the first exam (September 12).
Web Site: A scholar site will be used for the syllabus, homework, reading assignments, announcements and lecture material. You may access the site by going to: https://scholar.vt.edu/portal, login and then to ESM_2204_Deforms

Honor System: The Virginia Tech honor pledge is as follows: “I have neither given nor received unauthorized assistance on this assignment.” Violations of the honor pledge will not be tolerated in this course. For more information, see http://www.honorsystem.vt.edu/.

C- Rule:
A growing number of departments are requiring a C- in ESM 2204 before taking subsequent courses in their curriculum. Please note that this is NOT an ESM rule. Any questions or concerns about a C- rule should be directed to your home department.
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