

ENGR 2143 Strength of Materials // CRN = 22945

Spring 2007

Department of Engineering and Physics

University of Central Oklahoma

Location	Howell Hall 100
Time	MWF 9:00 - 9:50 a.m.
Instructor	Evan Lemley, Ph.D.; Assoc. Prof. of Engineering and Physics
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Phone	(405)974-5473
Office Hours	MWF 10:00 - 10:50 a.m. or by appointment.
Final	W May 2, 2007 from 9:00 - 10:50 a.m.

Course Description

This course provides an introduction to solid mechanics: concepts of stress and strain; mechanical behavior of engineering materials; analysis of bodies under axial, torsional, and flexural loading; and stress, strain and deflections in beams.

Prerequisites

ENGR 2033 Statics

Textbook (Required)

Mechanics of Materials, 4th Edition, Ferdinand P. Beer, E. Russell Johnston, Jr., and John T. DeWolf, McGraw-Hill, 2006.

ISBN: 0-07-298090-7

Objectives

The student shall be able to

1. Calculate the stress and strain in loaded two-force members.
2. Demonstrate understanding of stress and strain diagrams for engineering materials and of the application of Hooke's and Poisson's laws to loaded members.
3. Calculate stresses in axially loaded members.
4. Calculate stresses in torsionally loaded members.
5. Calculate stresses in flexurally loaded members.
6. Calculate shear stresses in loaded members.
7. Use stress and strain transformation theory and Mohr's circle to calculate principle stresses in loaded members.
8. Analyze and design beams and shafts.
9. Calculate deflections of beams and shafts.
10. Demonstrate understanding of the application of energy methods to the analysis of beams and trusses.

Topics

1. Stress Concepts
2. Axial Loading
3. Torsion
4. Pure Bending – Flexure
5. Beam Design
6. Shear Stress in Thin-Walled Members

7. Stress and Strain Transformation
8. Beam Deflections
9. Columns
10. Energy Methods (time permitting)

Calculator

You must own a scientific calculator – see *the list of allowed calculators for exams in the Department of Engineering and Physics*. **Please bring your calculator to class for each meeting.**

Engineering Paper

Engineering Paper -- available from the UCO bookstore, Thompson's Bookstore, and Triangle A&E at Broadway Ext. and 63rd. Please use engineering paper for all homework assignments.

Internet & E-mail

Access to the Internet and ability to send and receive E-mail. If you do not have a computer at home you can use machines on the UCO campus: Look at <http://technology.ucok.edu/support/microcomplab.htm> for a full list of available general use computers on campus.

Note: E-mails directed to the entire class such as class announcements will go to your official UCO e-mail address (the address that ends in *ucok.edu*).

Portable Electronic Devices (including cell phones)

Please turn off any portable electronic devices (esp. cell phones) during class. You may not access any portable electronic device during exams except calculators that are on the approved list for Engineering and Physics courses.

Instruction Techniques

Lecture will be used predominantly although sometimes recitation periods will be employed. Lectures often involve examples and are encouraged to be as interactive as possible.

Class Polices

Attendance is not required, but you will responsible for any announcements or notes from class (and quizzes).

Attendance is mandatory for all exams or other graded activities (e.g. project competitions or presentations).

Cheating or academic dishonesty of any kind will not be tolerated.

Homework

Working HW problems in a timely manner is the best way to do well on exams and in the class as a whole. Homework is due at the beginning of the class period on the due-date or due-day. Homework should be neatly written on only one side of your paper, folded length-wise with your name written on the outside of the folded pages before turning it in. Each problem should fit all of the following criteria: clearly labeled, **one problem per sheet of paper**, legible and organized. HW papers that do not fit these criteria will be penalized accordingly. See the following web-page:

http://evan.lemley.org/courses/hwk_format.php
for details on the presentation of HW problems.

Each HW problem you turn in is worth ten points. Some problems will be graded on detailed solutions and others will be graded on effort. I will **not** tell you ahead of time which or how many problems will be graded relative to a detailed solution, but on the returned and graded HW paper a check mark next to the problem number will indicate full effort (or ten points) and a numerical score (e.g. 8/10) next to the problem number will be used on those problems under more scrutiny.

Project

There will be Team Design Projects in this course. Projects will constitute a significant portion of your grade. More information will be given to you as project assignments are made.

Grading Policies

The following table shows the breakdown of credit for the course.

HW and Misc.	15%
Exams (x3)	10%
Project	25%
Final Exam	30%
Total	100%

Tentative Grading Scale

90-100% -- A, 80-90% -- B, 70-80% -- C, 60-70% -- D, <60% -- F

STUDENT INFORMATION SHEET / SYLLABUS ATTACHMENT

See separate handout or go to:

<http://www.busn.ucok.edu/academicaffairs/FORMS/Student%20Information%20SheetSPR07.pdf>

ENGR 2143 Tentative Schedule for Spring 2007			
Week	Date	Day	Sections Covered
1	08Jan2007	Mon	Intro + 1.1 – 1.4
	10Jan2007	Wed	1.5 – 1.7
	12Jan2007	Fri	1.8 – 1.10
2	15Jan2007	Mon	NO CLASS – MLK Day
	17Jan2007	Wed	1.11 – 1.13
	19Jan2007	Fri	2.1 – 2.6
3	22Jan2007	Mon	2.7 – 2.9
	24Jan2007	Wed	2.10 – 2.11
	26Jan2007	Fri	2.12 – 2.15
4	29Jan2007	Mon	2.17 – 2.19
	31Jan2007	Wed	3.1 – 3.3
	02Feb2007	Fri	3.4 – 3.6
5	05Feb2007	Mon	Exam 1
	07Feb2007	Wed	3.7 – 3.8
	09Feb2007	Fri	3.12 – 3.13
6	12Feb2007	Mon	4.1 – 4.3
	14Feb2007	Wed	4.4 – 4.5
	16Feb2007	Fri	4.6 – 4.7
7	19Feb2007	Mon	4.12 – 4.14
	21Feb2007	Wed	5.1 – 5.3
	23Feb2007	Fri	5.4 – 5.6
8	26Feb2007	Mon	6.1 – 6.3
	28Feb2007	Wed	6.4 – 6.5
	02Mar2007	Fri	Exam 2
9	05Mar2007	Mon	6.6 – 6.7
	07Mar2007	Wed	6.9
	09Mar2007	Fri	7.1 – 7.2
10	12Mar2007	Mon	7.2 – 7.4
	14Mar2007	Wed	7.5 – 7.6
	16Mar2007	Fri	7.9
11	19Mar2007	Mon	NO CLASS – SPRING BREAK
	21Mar2007	Wed	NO CLASS – SPRING BREAK
	23Mar2007	Fri	NO CLASS – SPRING BREAK
12	26Mar2007	Mon	7.10 – 7.13
	28Mar2007	Wed	9.1 – 9.3
	30Mar2007	Fri	9.4 – 9.5 (Last Day to Drop)
13	02Apr2007	Mon	9.7 – 9.8
	04Apr2007	Wed	9.9 – 9.11
	06Apr2007	Fri	9.12 – 9.13
14	09Apr2007	Mon	Exam 3
	11Apr2007	Wed	10.1 – 10.3
	13Apr2007	Fri	10.3
15	16Apr2007	Mon	10.4 – 10.5
	18Apr2007	Wed	10.6 – 10.7
	20Apr2007	Fri	11.1 – 11.3
16	23Apr2007	Mon	11.4 – 11.5
	25Apr2007	Wed	11.7 – 11.9
	27Apr2007	Fri	11.10
17	02May2007	Wed	FINAL – 9:00 – 10:50 a.m. HOH 100