University of Utah - Department of Mechanical Engineering

COURSE OUTLINE

ME 3300 Mechanics of Materials Spring 2009

Texts: Mechanics of Materials, Gere and Goodno 7rd ed. or Riley et al 5th Ed.

Prerequisites: **ME 1300 & a MATH COURSE with some ODE**

Class Time: T-H 09:10 AM-10:30 AM in WEB 2250

Instructor: Professor K. Larry DeVries

Office: 2220 MEB or lab-2151 MEB, Tele. 581-7101 <kldevries@mech.utah.edu> Office Hours: Daily 7 to 7:25 AM - M,W,F -8:30 to 9:15 AM - T,H 8:30 to 9:00 AM as well as most Saturdays 7 to 9 AM (on Sat call before making trip to U) or by appointment.

Lab TA's and their office hours will be listed in the manual provide in the first lab.

Grading will be based on:

Lab reports	125 points
Homework and projects	100 "
2-Midterms*	200 "
Team Quizzes	25 "
Final*	200 "

*May include topics you should learn in the lab exercises, that are associated with this class.

In addition: There will be "team quizzes" given, on average, every week or two, the lowest 2 scores on these will not be counted. There is one way to learn Mechanics, i.e. by doing it. Accordingly extensive homework is assigned and must be worked to pass this course. You are encouraged to work "synergistically" with others on the homework. The **homework is "due" on the date it is assigned** and it may be discussed in class at the start of that class period. **It will be handed in** for grading **at the *start* of the first class in the next week** (i.e, problem set 2a is to be worked before class on Jan. 17 and may be discussed as well as the subject of a quiz on that date but not handed in until Jan. 24) **To pass the course, at least 60 % of homework must be worked and handed in**. Problems marked with an *** are problems that must be worked with the aid of a computer and handed in to pass the course!** **Late homework cannot be accepted for credit** (there are at least 5 days between the date when problems should be worked and when they are to be hand-in hence this should not pose a problem)

This schedule is somewhat tentative and may change depending on progress and interest of class.

For the Week starting Monday	Topic	Reading and problems are to be done before class on the assigned date! **GERE**	Reading & problems are to be done before class on the assigned date! **Riley**	Problem Set No. & Turn-In Date (put problem set #. on problems handed-in)
Jan.12	Introduction, Units	1.1-2 (Chpt. in Bold then sect.)	2.4, 3.4 (Chpt in Bold then sect.)	#1
	N-stress/strain & Mech. Prop.	1.2-9	2.1-4	Jan. 20
Jan. 19	"	"	4. 1-3	#2
	Shear stress/strain	"	4.1-3	Jan. 27
Jan. 26	Axially loaded members	2.1-5, 10	5.1-5, 5.7	#3
	Torsion & Power Transmission	3.1-4	6.1-4, 6.6	Feb3
Feb, 2	"	3.4-8, 10-11	6.9, 6.11-12	#4
	Shear & Bend. M diag. (review).	4.1-5	7.5-6	Feb. 10

Feb. 9	Exam # 1	--------	-------	#5
	Flexure stresses (normal)	5.1-6	7.1-4	Feb. 17
Feb.16	Vertical shear stresses in beams	5.8-11, 13	7.7, 7.10	#6
	Composite Beams	6.1-3	7.13-14	Feb. 24
Feb. 23	Shear centers	6.6-9	7.12	#7
	Stress resolution (review)	7.1-3	2.5-9	Mar. 3
Mar. 2	Mohr's circle (review)	7.4-5, 6	2.10-11	#8
	Strain resolution & Strain gages	7.7	3.3-7	Mar10
Mar. 9	Pressure vessels	8.1-3, HO (thick-wall cyl.)	5.9-10	#9
	Combined loadings	8.4-5	7.16	Mar.17
Mar. 16-20	Spring Break			
Mar. 23	Failure Criteria	1.7 & HO	10.6-8	#10
	EXAM #2	----------	----------	Mar. 31
Mar. 30	Deflection of beams (DE)	9.1-3	8.1-3	#11
	Deflection of beams (sup-post.)	9.5	8.6	Apr.7
Apr. 6	Energy Methods	2.7, 3.9, 9.8-9	8.8, 10.2-5	#12
	"	9.9-10	"	Apr.14
Apr. 13	"and Statically indeterminate pr.	10.1-4, HO	54, 6.7, 8.7	#13
	"	"	"	Apr.21
Apr. 20	Columns (review & new)	11.1-4	9.1-3	#14
	Columns	11.5-6, 9	9.4-7	Apr. 28
Apr. 27	Discussion of design considerations such as fatigue, fracture, Creep, etc.			#15

Final: Monday. May 4th 8:00 to 10:00 AM

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This course involves the study of the behavior of engineering materials under loads and is commonly called Strength of Materials or Mechanics of Materials (often referred to as "***STRENGTHS"*** by students). "Strengths" is the study of the deformation of materials (bending, twisting, stretching, buckling, etc.) to which forces or moments are applied. Mechanics is an applied science, its purpose is to explain and predict physical phenomena and thus lay the foundations for engineering applications. Those who complete the course should be able to calculate stresses and strains in various types of machine elements under various loadings, resolve stresses and strains on to various planes and determine their principle values, determine deformation and deflections, determine failure loads (using various failure criteria), as well as have an understanding of failure mechanisms including yielding, brittle failure, creep, fatigue, and buckling, etc.

Note: You may (are even encouraged to) work with others on your homework. Brainstorming with others can be a very effective learning tool. However, the problems you hand in should reflect your own efforts. No Xerox or other copies are acceptable. Engineering is a profession where safety, life and well being of individuals depend on engineers being not only competent but entirely honest. Hence, anyone found copying from others, from solution manuals, etc. may be severely disciplined.

The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in this class, reasonable prior notice needs to be given to the instructor and to the Center for Disability Services, 162 Olpin Union Building, 581-5020 (V/TDD) to make arrangements for accommodations.----All written information in this course can be made available in alternative format with prior notification.

THE COLLEGE OF ENGINEERING GUIDELINES ON: (1) APPEAL PROCEDURES, (2) WITHDRAWAL PROCEDURES, (3) THE REPEATING COURSES POLICY (I.E. ONLY THE 2ND ATTEMPT COUNTS), AND (4) ADDING CLASSES ARE POSTED THROUGHOUT MEB AND WEB, [e.g. THE BULLETIN BOARD NEXT TO MY OFFICE (2224 MEB)]. [ALSO AT: http://www.coe.utah.edu]