Course Syllabus for ENGR 3311
Fall 2009

Course Title: ENGR 3311.251 Mechanics of Materials
Prerequisites: MATH 3375, PHYS 1430

Instructor: Dr. Jitendra S. Tate
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Office Hours: Tuesday; Wednesday; and Thursday (noon-2pm). Friday by appointment.

Required Text:
Mott, R.L. (2002) Applied Strength of Materials. Prentice Hall, Inc., New Jersey. 5th Edition.

Reference Books:
- Beer, F.P. and Johnston E.R. Mechanics of Materials. McGraw Hill Book Company. 4th Edition.
- Hibbeler R. C. Mechanics of Materials. Prentice Hall. 6th Edition.

Course Description:

This course deals with material that is the background for engineering design. Engineered products are subject to various kinds of stress in service such as normal stress, shear stress, and bending stress. Under the influence of the stresses the engineered product could break (or rupture) of deflect excessively. Under some circumstances the engineered product may buckle down and fail. It is important that the engineer design machine members and structures that do not fail in any conceivable way. In order to do this, the engineer needs to evaluate the stresses that may be present in engineered products due to various loads (forces and moments). Once this stress is evaluated, suitable material and/or dimensions could be chosen so as to render the product failure proof. Essential background information for this course is drawn from Materials Science and Engineering Mechanics.

Course Objectives:
- Understand the concepts of linear elasticity, including Hooke's Law and Poisson's Ratio.
- Be able to define normal and shear stresses and calculate their values for members with known external axial and lateral forces, torques, and bending moments.
- Be able to define normal and shear strains and to calculate their values for members with known stresses.
- Understand the basic geometries of beams and be able to perform analysis of internal stresses, including the determination of maximum values for shapes common to engineered structures.

Evaluation:

Performance in classwork, homework, and class exams will determine the student's numerical score out of a possible 100. Specifically, the following determine the numerical score:

Grading *(Scale: 90-100 (A), 80-89.9 (B), 70-79.9 (C), 60-69.9 (D), 59.9 or less (F))*

Homework/Lab Reports/Unannounced Quizzes	15
Class Test #1	30
Class Test #2	25
Final Exam	30
	100
Attendance (unexcused)	**Reduction of 2% per day absence**

Additionally, the student's overall performance in the course as subjectively evaluated by instructor will be used as an input in determining grades.

General Policies and Procedures:

1) No food or drinks are permitted in the classroom.
2) No smoking or tobacco use of any kind in the lab or classrooms per state law.
3) All departmental and University policies on academic integrity and absences apply and should be taken very seriously.
4) No cell phone use during appointed class times.
5) Coming late and leaving early is completely unacceptable. You will be marked absent if you do so.
6) You must check your emails regularly and also need to visit 'TRACS' for important announcements, due dates, course documents, and assignments.

Absences:

It is urged that the students not miss any class. Attendance policies as mandated by the department will also be strictly adhered. **Scheduled exam absences or overdue homework and projects will not be accepted** unless there exists legitimate excuses (illness, death in family, etc.). However, it is the student's responsibility to obtain class notes, handout materials, if any, etc., when a scheduled lecture is missed.

Special Needs:

Students with special needs (as documented by the Office for Disability Services) should identify themselves to the instructor at the beginning of the semester so that provisions for accommodation can be made.

Course Outline:

Topic #	Topic	Chapter #
1	Review of Statics And Introduction to SOM	Class Notes
2	Basic Concepts in SOM	1
3	Stress, Strain, and Modulus of Elasticity	1
4	Properties of Materials	2
5	Design of Members Under Direct Stress	3
6	Axial Deformation and Thermal Stress	3
7	Centroid and Moment of Inertia	6
8	Torsion	4
9	Shear Forces and Bending Moments	5
10	Stresses due to Bending	7
11	Deflection of Beams	9
12	Columns	11
13	Shear Stresses in Beams	8
14	Combined Stresses	10