MECH 2320 Strength of Materials

Classes meet in JSOM 2.801, MWF 9:00-9:50 am

INSTRUCTOR	Dr. Hongbing Lu, Professor, Associate Department Head, and Louis A. Beecherl, Jr. Chair, Mechanical Engineering, hongbing.lu@utdallas.edu, 972-883-4647, ECSN 2.528.
TA	Alison S. Lee, shl090020@utdallas.edu
INSTRUCTOR OFFICE HOURS	ECSN 2.528, 11:00 AM – 12:00 PM, Wednesdays and Thursdays in Office, other times as available, or by appointment.
TA OFFICE HOURS	In ECSS 3.619, Tuesdays & Thursdays 4:00-5:00 PM.
REQUIRED TEXT	Mechanics of Materials, R.C. Hibbeler, 9th Edition, Prentice Hall
PREREQUISITES, COREQUISITES	Prerequisite: MECH 2310. Corequisite: MECH 2120.
WEBSITE	Up-to-date information about the course (syllabus, assignments, solutions, handouts, grades, etc.) is on eLearning.utdallas.edu.
COURSE DESCRIPTION	Lecture course. Introduction to stress and deformation analysis of basic structural elements subjected to axial, torsional, bending, and pressure loads.
COURSE OBJECTIVES	Introduce analysis of stress and strain in a beam under loads for purposes of the design analysis to determine the strength, deformation and stability of a deformable solid. Specifically, the course will

- apply knowledge in mathematics, science and engineering to formulate and solve engineering problems in strength of materials;
- solve stress and deformation in an elementary beam subjected to axial, torsional, bending, and pressure loads;
- introduce planar stress and strain transformation;
- introduce mechanical behavior of materials. Primary focus will be on the elastic behavior of materials, with an introduction to plastic behavior of materials;
- analyze buckling of columns under compression;
- solve for deformations in a beam using energy methods;
- introduce thermal stress and residual stress;
- clearly communicate results to others via written solutions.

COURSE CONTENT, COURSE SCHEDULE	Introduction and Concept of Stress	Week 1
	Concept of Strain	Week 1
	Mechanical Properties of Materials	Week 2
	Axial Load	Week 3
	Torsion	Week 4
	Mid-term I	Week 5
	Beam Bending	Week 6
	Transverse Shear	Week 7
	Pressure Vessels	Week 8
	Stress Transformation	Week 9
	Strain Transformation	Week 10
	Midterm II	Week 11
	Design of Beams and Trusses	Week 12
	Deflection of Beams and Shafts	Week 13
	Buckling of Columns under Compression	Week 14
	Energy Methods	Week 15
	Final Exam, Per UTD Schedule	Week 16

HOMEWORK ***Homework is due at the start of class, and will be collected at that time***. Late homework **will not be accepted** without the consent of the instructor and will not be accepted except for unusual circumstances, in which case a prior arrangement has to be made before the due day. Homework must be presented in an organized and professional manner. Penalties are given for messy and unorganized homework.

GRADE BASIS In calculating your final grade for the course, the following percentages will be used:

Homework	20%
Midterm Exam One	25%
Midterm Exam Two	25%
Final Exam	30%

Use of electronic devices (other than calculator) is not permitted during class. In the case where notebook computers are used to take notes, permission is required beforehand; in which case the students are required to show the notes taken by a notebook computer to the instructor at the request of the instructor.