

CEE/ME 2340 Mechanics of Deformable Bodies

(Required Course)

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Catalog Course Description

Introduction to analysis of deformable bodies including stress, strain, stress-strain relations, torsion, beam bending and shearing stresses, stress transformations, beam deflections, statically indeterminate problems, energy methods, and column buckling.

Prerequisites

CEE/ME 2310 Statics

Textbook and Other Related Material

Required Text:

Beer, F. P., E. R. Johnston, J. T. DeWolf, and D.F. Mazurek. Mechanics of Materials. Sixth Edition, 2012. McGraw-Hill, New York, N. Y. ISBN 978-0-07-338028-5.

Course Objectives

To develop and present the relationships and equations for determining stresses and strains in a deformable body subjected to various types of loading. To provide students with the analytical background to analyze and design mechanical and structural systems.

Course Requirements

Homework and participation	20% of grade
2 Exams	50% of grade
Final Exam	30% of grade

Class/Laboratory Schedule

Sixteen 180 minutes class sessions over the semester – Everyday 9:00 am to 12:00 pm and 1:00 pm to 4:00 pm.

Office Hours

Every day 4:00 PM-6:00 PM

Curriculum Professional Component Allocation

Engineering Science and Design: 3 Term Credit Hours or 100 percent of the course content

Relevant Program Outcomes

This course includes, but is not limited to, content that supports the educational objectives and outcomes of the environmental and civil engineering programs. Specific emphasis is placed on students attaining and demonstrating:

- An ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, social, political, ethical, health and safety, manufacturability, and sustainability (Outcome C).
- An ability to identify, formulate, and solve engineering problems (Outcome E).
- An ability to use the techniques, skills, and modern engineering tools necessary for engineering practice (Outcome K).

Topics Covered

Date	Topic	Reference
01/07 Morning	Introduction	Chapter 1
01/07 Afternoon	Stress and Strain - Axial loading	Chapter 2 (Sec. 2.1-2.10)
01/08 Morning	Stress and Strain - Axial loading (cont'd)	Chapter 2 (Sec. 2.11-2.15 & 2.17-2.18)
01/08 Afternoon	Torsion	Chapter 3 (Sec. 3.1-3.8)
01/09 Morning	EXAM 1 (90 min) / Pure Bending	Chapter 4 (Sec. 4.1-4.3)
01/09 Afternoon	Pure Bending (cont'd)	Chapter 4 (Sec. 4.4, 4.7)
01/10 Morning	Pure Bending (cont'd)	Chapter 4 (Sec. 4.12-4.14)
01/10 Afternoon	Analysis and Design of Beams	Chapter 5 (Sec. 5.1-5.3)
01/11 Morning	Analysis and Design of Beams (cont'd)	Chapter 5 (Sec. 5.4)
01/11 Afternoon	Shearing Stresses in Beams & Thin-walled Members	Chapter 6 (Sec. 6.1-6.5)
01/14 Morning	EXAM 2 (90 min) / Shearing Stresses in Beams & Thin-walled Members (cont'd)	Chapter 6 (Sec. 6.6-6.7)
01/14 Afternoon	Transformation of Stress and Strain	Chapter 7 (Sec. 7.1-7.4 & 7.9)
01/15 Morning	Deflection of Beams	Chapter 9 (Sec. 9.1-9.5)
01/15 Afternoon	Deflection of Beams (cont'd)	Chapter 9 (Sec. 9.9-9.11)
01/16 Morning	Columns	Chapter 10 (Sec. 10.1-10.4)
01/16 Afternoon	FINAL EXAM	

Prepared by: Usama El Shamy

Date: 10/17/12

Disability Accommodations: Students needing academic accommodations for a disability must first contact Ms. Rebecca Marin, Coordinator, Services for Students with Disabilities (214-768-4557) to verify the disability and establish eligibility for accommodations. They should then schedule an appointment with the professor to make appropriate arrangements. (See University Policy No. 2.4.)

Religious Observance: Religiously observant students wishing to be absent on holidays that require missing class should notify their professors in writing at the beginning of the semester, and should discuss with them, in advance, acceptable ways of making up any work missed because of the absence. (See University Policy No. 1.9.)

Excused Absences for University Extracurricular Activities: Students participating in an officially sanctioned, scheduled University extracurricular activity will be given the opportunity to make up class assignments or other graded assignments missed as a result of their participation. It is the responsibility of the student to make arrangements with the instructor prior to any missed scheduled examination or other missed assignment for making up the work. (University Undergraduate Catalogue)