

# CE 224 Mechanics of Materials

2024-25 Spring Semester

## **Instructor:**

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## **Teaching Assistant:**

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## **Time and Location:**

<b>Tuesday</b>	13.30 - 15.15	B211
<b>Thursday</b>	10.45 - 12.30	B211

## **Course description:**

Tension, compression, and shear; axially loaded members; Torsion of circular shafts; Equilibrium, compatibility, and constitutive relations; Stresses in beams; Analysis of stress and strain; Deflection of beams; Buckling of columns.

## **Prerequisite(s): CE 221**

## **Text Book:**

**Mechanics of Materials**, Hibbeler, R.C. 9<sup>th</sup> (SI) ed., Pearson Inc., 2014.

## **References:**

*Mechanics of Materials*, Beer, F.P., Johnston, J.T., DeWolf, D.F, and D.F. Mazurek, 6<sup>th</sup> ed., McGraw-Hill, Inc., 2012.

*Introductory Mechanics of Deformable Bodies*, Ersoy, U., Wasti, S. T. and E. Canbay, METU Press, Ankara, 2009.

*Introduction of Mechanics of Solids*, Popov, E.P., Prentice Hall of India, 1978.

## **Course Website:**

Students are required to enrolled to **CE224** on **TEAMS**. All announcements and course material will be posted on TEAMS.

## **Important:**

Attendance and problem solving experience are essential for success in this fundamental course.

Entire course will follow the textbook. Content of the course and the reading assignments given in the tentative course outline given below; refer to Chapters and Sections in the Textbook. Teaching approach, order and sign conventions used will be those of the Textbook.

- All solved examples in the Textbook, related to the sections included in the course, are to be considered as also solved on the board in the classroom.
- Students are expected to master all problems given at the end of each chapter of the textbook.

**Grading:**

The final grades will be computed according to the following scheme:

<b>Assessment</b>	<b>Weight</b>	<b>Date</b>
<b>Midterm I</b>	25%	<b>14.11.2024</b> (Tentatively)
<b>Midterm II</b>	25%	<b>24.12.2024</b> (Tentatively)
<b>Homework</b>	10%	weekly
<b>Final Exam</b>	40%	<b>07.01.2025</b> (Tentatively)

**Tentative Course Outline**

<b>Week</b>	<b>TOPICS</b>	<b>Reading Assignments from textbook</b>
1	Stress	1.1, 1.2, 1.3, 1.4, 1.5, 1.6, 1.7
	Strain	2.1, 2.2
2	Mechanical Properties of Materials	3.1, 3.2, 3.3, 3.4, 3.5, 3.6, 3.7
3	Axial Load	4.1, 4.2, 4.3, 4.4, 4.5, 4.6, 4.7
4	Torsion	5.1, 5.2, 5.4, 5.5, 5.6
5	Bending	6.1, 6.2, 6.3, 6.4
6	Bending	6.5, 6.6
7	Transverse Shear	7.1, 7.2, 7.3
	<b>Midterm I</b>	
8	Transverse Shear	7.4, 7.5
9	Combined Loadings	8.1, 8.2
	Transformation of stress	9.1, 9.2
10	Transformation of stress	9.3, 9.4
11	Deflection of Beams and Shafts	12.1,12.2, 12.4, 12.5, 12.6
12	Deflection of Beams and Shafts	12.7,12.8
13	<b>Midterm II</b>	
	Buckling of Columns	13.1
14	Buckling of Columns	13.2, 13.3
	<b>Review</b>	
15	<b>FINALS</b>	
16		