

MECH 2322: MECHANICS OF MATERIALS

Fall 2023

Instructor:	Armanj D. Hasanyan	Time:	TR 3:00 pm to 4:20 pm
Email:	adhasanyan@utep.edu	Classroom:	Undergraduate Learning Center 342

Office Hours: Regular office hours will be held on **Fridays, 12:00 pm to 1:00 pm at A106, or by appointment**. If you want to meet Dr. Hasanyan outside of the office hours, please send an email at least 24 hours in advance for arrangements. Unexpected visits without an appointment or on short notice cannot be guaranteed. Additional office hours will be available depending on homework and exam due dates.

There will be a teaching assistant (TA) assigned (to be announced). The TA will assist the instructor in quizzes and exams, proctoring exams, and answering questions. In addition to the instructor's office hour, there will be TA's office hours to answer your questions. The TA's schedule will be announced on the second week of the class. **Please refer to the TA office hours for all daily/weekly homework and material needs.**

Students are reminded of the tutoring services available in the ACES and the library. These services are provided to you by the University. Check the schedules and make use of the services.

Course Overview: Mechanics of Materials is a fundamental engineering course that introduces students to the behavior of materials under different loading conditions. The course covers the analysis of stresses, strains, deformations, and failures of structural components subjected to axial, torsional, and bending loads. Concepts learned in this course are essential for designing and analyzing various engineering structures, from bridges, aircraft structures, space structures, biological structures, MEMS, and other mechanical components.

Prerequisites: MECH 1321 - Mechanics I-Statics or BE 2434 - Mechanics I, and CE 2315 - Statics

Required Textbook: The following textbook is required for the course:

- R. C. Hibbeler, *Mechanics of Materials*, Pearson Prentice Hall, 2014 (**9th EDITION!!**).

Students are encouraged to study materials related to the subjects discussed in the class. There are many books that can help students to improve their understanding of the subjects and their problem solving skills. Some additional reference books that you can find include the following:

- F. P. Beer, E. R. Johnston, J. T. DeWolf, *Mechanics of Materials*, McGraw-Hill Education, 2020.
- A. C. Jenson and H. Chenoweth, *Statics and Strength of Materials*, Career Education, 1982.
- G. F. Limbrunner and L. Spiegel, *Applied Statics and Strength of Materials*, Pearson Prentice Hall, 2009.
- R. R. Craig, *Mechanics of Materials*, Wiley, 2011.

Course Grade: Homework (20%), Quizzes (10%), Midterm 1 (20%), Midterm 2 (20%), Final (30%). The grade scale is as follows:

100 - 90 %	A
90 - 80 %	B
80 - 70 %	C
70 - 60 %	D
less than 60 %	F

Several quizzes will be given throughout the semester. The content of a quiz could be the materials covered in previous sessions or to be covered that day. Lowest score quiz will be eliminated. There will be no make-up quizzes. Two exams will be given during the semester during class hours. Every student is required to take the departmental final exam at the end of the semester. Do not make travel plans that conflict with the final exam date.

Important Dates: Tentative dates for midterms:

Midterm #1	October 5
Midterm #2	November 16
Final Exam	To Be Announced

Homework: Homework is due at the beginning of class. Homework sets are given every 1 to 2 weeks (approximately), and you will get 1 to 2 weeks to complete them. **Late submissions will not be accepted.** Collaborations are allowed, but copying homework will be strictly prohibited and enforced. In your homework, make sure to show your complete work and box the final answer to each problem, so that grader can easily grade your homework. Illegible solutions will be deducted. Make sure handwriting and plots are clearly explained and legible. Homework solution will be posted after the submission.

Allowed Calculators: The following will be the only calculators allowed in exams:

- Casio: All fx-115 models. Any Casio calculator must contain fx-115 in its model name.
- Hewlett Packard: The HP 33s and HP 35s models, but no others.
- Texas Instruments: All TI-30X and TI-36X models. Any Texas Instruments calculator must contain either TI-30X or TI-36X in its model name.

These are the same calculators that are currently being allowed in the Fundamental of Engineering (FE) and Professional Engineering (PE) exams (<http://www.ncees.org/exams/calculators/>). It is your responsibility to get acquainted with the features of the calculator you decide to use. I recommend that you use this calculator for all your work (including other courses) since this will help you learn how to use all the features of your calculator.

Attendance and Tardiness: Attendance is mandatory. Absence can be checked by the instructor through quizzes, exams, roll calling, randomly picked names for problem solving in class, or other mechanisms. **You could receive an F grade if you miss more than three classes without the instructor's consent.** The instructor appreciates all efforts to attend the class. There will be no penalty for being late. **However, exams and quizzes may be given at the beginning of the classes. No additional time will be allowed for late attendees.**

Policy on Cheating: Students are expected to be above reproach in all scholastic activities. Students who engage in scholastic dishonesty are subject to disciplinary penalties, including the possibility of failure in the course and dismissal from the university. Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student, or the attempt to commit such acts@ (Regents= Rules and Regulations, Part One, Chapter VI, Section 3, Subsection 3.2, Subdivision 3.22). Scholastic dishonesty harms the individual, all students, and the integrity of the university, policies on scholastic dishonesty will be strictly enforced.

Misconduct: Lack of knowledge of the academic honesty policy is not a reasonable explanation for a violation. Please refer to the UTEP academic misconduct policy.

Topics Covered:

1. Stress (Chapter 1)
2. Strain and basic elasticity (Chapter 2)
3. Mechanical Properties of Materials (Chapter 3)
4. Axial Loading (Chapter 4)
5. Torsion (Chapter 5)
6. Pure Bending (Chapter 6)
7. Shear/transverse loading (Chapter 7)
8. Combined loading. (Chapter 8)
9. Stress and strain transformations (Chapter 9)
10. Design of shafts and beams (Chapter 11)
11. Beam deflections (Chapter 12)
12. Column buckling (Chapter 13)