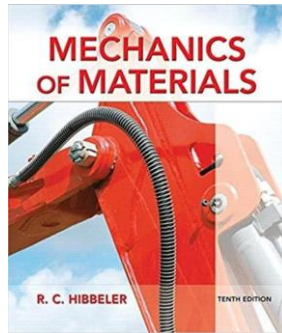


CE 2334: Mechanics of Materials

Fall 2020 (Revised August 23, 2020)

Class Reference Number: 12513
Class Meeting: 9:00-10:20 am, TR
Class Room: Online (via Blackboard)
Textbook: **Mechanics of Materials, 10th ed. (Required)**
by R.C. Hibbeler



You can find this book on many internet web sites or UTEP book store. You will also need to have access to the online homework problems.

Prerequisite: MATH 1411: Calculus
CE 2315: Statics

Instructor: Wen-Whai Li, Ph.D., P.E.
Professor
Department of Civil Engineering
Office: A211
Phone: 747-8755 (office)
E-mail: wli@utep.edu
Office Hours: 11:00 a.m. - 12:00 p.m., TR (via Blackboard)

Course Description

Mechanics of Materials is the second course of classic engineering mechanics. It addresses stress and strain theories, axial loading, torsion, combined stresses, and beam and column design. It is a capstone course for all advanced courses in engineering design and analysis. CE 2334 is a required course for students with major in civil engineering. Students must pass this course with a “C” or above grade before advancing to any civil engineering upper division course.

Course Objectives

At the end of the course, students will learn the following:

- 1) Solve basic axial, torsion and beam bending stress analysis and deflection problems.
- 2) Solve simple combined loading stress analysis and deflection problems.
- 3) Have a good understanding of stress and strain components, stress transformation in 2D and 3D.
- 4) Solve statically indeterminate problems.
- 5) Ability to resolve internal tractions (stresses) with properly chosen F.B.Ds.

Topics covered

1. Stress (Chapter 1)
2. Strain and basic elasticity (Chapter 2)
3. Mechanical properties of materials (Chapter 3)
4. Axial Load (Chapter 4)
5. Torsion (Chapter 5)
6. Bending (Chapter 6)
7. Transverse Shear (Chapter 7)
8. Combined loading (Chapter 8)
9. Stress and strain transformations (Chapter 9)
10. Design of beams and shafts (Chapter 11)

Approved Calculators (Scientific Calculators)

- **Casio:** All **fx-115** models. Any Casio calculator must contain fx-115 in its model name.
- **Hewlett-Packard:** The **HP33s** 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.

Grades

Your grade for this course will be assessed based on your performance in the attendance and discussion (10%), quizzes (15 %), mid-term exams (35 %), teamwork and homework (15 %), and final exam (25 %). Several online 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. Quizzes may be synchronous or asynchronous. There will be no make-up quizzes. Your worst quiz will not be counted for your grade. Three synchronous exams will be given during the semester. Make-up exams will be given only for extremely credible reasons. Every student is required to take the final exam at the end of the semester.

Your final grade will be calculated based on the points you have accumulated as follows:

A	≥85
B	≥75 but <85
C	≥65 but <75
D	≥50 but <65
F	<50

The instructor reserves the right to revise this grading plan. However, students will be informed of any changes during the semester.

Homework

Students are encouraged to solve all problems contained in the book. All homework will be assigned online using Hibbeler's online assignment available through Pearson's Mastering Engineering. You do not need to turn in some of the homework problems assigned in this syllabus but not appear in the Mastering Engineering assignment. These problems are listed as preliminary (P) or fundamental problems (F) in the book. Deadline for completing the homework will be shown in the Mastering Engineering and the rules for grading each of the homework problems will be provided in the Mastering Engineering webpage for this course. Late homework problems will receive less credits. **Mastering Engineering Course ID: li47089**

Start a problem with one new sheet. Use only one side of a sheet. Discuss the problems with your classmates, the teaching assistant, or the instructor, but do not copy homework from each other. You will do well in the class if you understand thoroughly all the problems you solved. All problems should contain a free body diagram. Neatness is essential. Give necessary details in the solution so that you can easily follow your own calculations.

Course Portfolio

Students are strongly advised to prepare a course portfolio documenting all materials relevant to the course. The portfolio shall contain the class notes, quizzes, exams, homework, study notes, and any relevant materials accumulated during the semester. The instructor believes the students will benefit from the portfolio years later when they need to review the learned subjects for advanced courses or professional engineer licensure exam.

Attendance and Discussion

Because this is an online course, attendance is determined by online participation of class. Participation is determined by completion of the following activities:

- Reading/Viewing all course materials to ensure understanding of assignment requirements
- Participating in engaging discussion with your peers on the Discussion Boards (grading rubric provided in the “grading information” area of each forum)
- Completing all team assignments

Attendance in the synchronous class is mandatory. Absence can be checked by the instructor through exams, Blackboard 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. Part of being a professional is being on time and being prepared to do your job. This applies to your career as a student as much as it does to your future career as an engineer. If you are late to class, you are to join in quietly. There will be no penalty for being late. However, all exams, and many quizzes will be given at the beginning of the classes. No additional time will be allowed for late attendees.

Technology Requirements

Course content is delivered via the Internet through the Blackboard learning management system (LMS). Ensure your UTEP e-mail account is working and that you have access to the Web and a stable web browser. Mozilla Firefox and Google Chrome are the most supported browsers for Blackboard; other browsers may cause complications with the LMS. When having technical difficulties, update your browser, clear your cache, or try switching to another browser.

You will need to have or have access to a computer/laptop, scanner, a webcam, and a microphone. You will need to download or update the following software: Microsoft Office, Adobe, Flashplayer, Windows Media Player, QuickTime, and Java. Check that your computer hardware and software are up-to-date and able to access all parts of the course.

If you encounter technical difficulties beyond your scope of troubleshooting, please contact the [Help Desk](#) as they are trained specifically in assisting with technological needs of students.

Netiquette

- Always consider audience. Remember that members of the class and the instructor will be reading any postings.
- Respect and courtesy must be provided to classmates and to instructor at all times. No harassment or inappropriate postings will be tolerated.
- When reacting to someone else’s message, address the ideas, not the person. Post only what anyone would comfortably state in a F2F situation.
- Blackboard is not a public internet venue; all postings to it should be considered private and confidential. Whatever is posted on in these online spaces is intended for classmates and professor only. Please do not copy documents and paste them to a publicly accessible website, blog, or other space. If students wish to do so, they have the ethical obligation to first request the permission of the writer(s).

Drop Policy

To drop this class, please contact the [Registrar’s Office](#) to initiate the drop process. If you cannot complete this course for whatever reason, please contact me. If you do not, you are at risk of receiving an “F” for the course.

Accommodations Policy

The University is committed to providing reasonable accommodations and auxiliary services to students, staff, faculty, job applicants, applicants for admissions, and other beneficiaries of University programs, services and activities with documented disabilities in order to provide them with equal opportunities to participate in programs, services, and activities in compliance with sections 503 and 504 of the Rehabilitation Act of 1973, as amended, and the Americans with Disabilities Act (ADA) of 1990 and the Americans with Disabilities Act Amendments Act (ADAAA) of 2008. Reasonable accommodations will be made unless it is determined that doing so would cause undue hardship on the University.

If you have a disability and need classroom accommodations, please contact The Center for Accommodations and Support Services (CASS) at 747-5148, or by email to cass@utep.edu, or visit their office located in UTEP Union East, Room 106. For additional information, please visit the CASS website at www.sa.utep.edu/cass.

Scholastic Integrity

Academic dishonesty is prohibited and is considered a violation of the UTEP Handbook of Operating Procedures. It includes, but is not limited to, cheating, plagiarism, and collusion. Cheating may involve copying from or providing information to another student, possessing unauthorized materials during a test, or falsifying research data on laboratory reports. Plagiarism occurs when someone intentionally or knowingly represents the words or ideas of another as ones' own. Collusion involves collaborating with another person to commit any academically dishonest act. Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. Academic dishonesty harms the individual, all students, and the integrity of the university; policies on scholastic dishonesty will be strictly enforced. All suspected violations of academic integrity at The University of Texas at El Paso will be reported to the [Office of Student Conduct and Conflict Resolution \(OSCCR\)](#) for possible disciplinary action. To learn more [HOOP: Student Conduct and Discipline](#).

Study Aids

- **Instructor's Office Hour**

You are always welcomed to visit the instructors at the posted hours or by making an appointment.

- **Teaching Assistant**

There will be a teaching assistant (TA) assigned to the course. The TA will assist the instructor in grading quizzes, proctoring exams, and answering questions. In addition to the instructor's office hour, there will be TA's online office hours to answer your questions. The TA's schedule will be announced in the second week of the class.

- **ACES and the Tutoring Center**

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.

- **Internet Learning**

One of the web sites the students may want to visit is <https://www.masteringengineering.com/site?login=1>. There are many exercise (multiple-choice and true-or-false) problems designed to help the students.

Study Guide

Read the text to be discussed prior to the scheduled class and review the subject thoroughly after the class. Read the textbook carefully. Work on all examples given in the text and solve as many unassigned problems as you can. Expect to spend 8 to 10 hours each week on the subject. Establish a good studying habit and you will do very well in the class.

References

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 of the books that you can find in the library are:

Jensen and Chenoweth, *Statics and Strength of Materials*. TA351.J4

Spiegel and Limbrunner, *Applied Statics and Strength of Materials*. TA351.S64

Hibbeler, *Engineering Mechanics: Statics*. 12th Edition.

D. Rylance, *Mechanics of Materials*. TA405.R794, 1996

R. Craig, *Mechanics of Materials*. TA405.C89, 1996

W. Riley, L.D. Sturges, and D.H. Morris, *Mechanics of Materials*. TA450.R55, 1999