

Applied Matls Sci Eng Fall 2023

MASE 6401 CRN: 15711, MME 5390 CRN: 13616

INSTRUCTIONAL TEAM

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COURSE DESCRIPTION

MASE 6401 (Advanced Mechanics of Materials) is a required 4-credit course (3 hours of lecture and 3 lab hours). The course will begin with a short introduction to mathematical concepts used in statics and mechanics of materials. Three broad topics will be covered in this class: 1) statics, 2) stress and strain (and transformations) and 3) mechanics of materials.

In this course, you will be asked to solve analytical equations to understand the distributions of stresses in deformable bodies under mechanical loads and varying stress states. We will use computational tools including python analysis and (time permitting) elementary finite element analysis to provide additional insight into the stress and strain response of materials under applied loads. We will progress into an introduction to yield, deformation and fracture of materials during mechanical testing and how to use this information in materials-based design efforts for structural materials.

The laboratory will focus primarily on applications of experimental measurements of the response of materials under various loading conditions including tension, compression, bending and indentation. We will conduct a number of investigations into the mechanical properties of materials and extract quantitative information on individual and batch experiments using python and other data science tools.

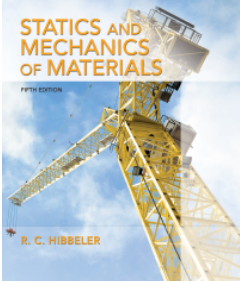
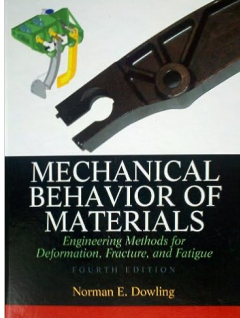
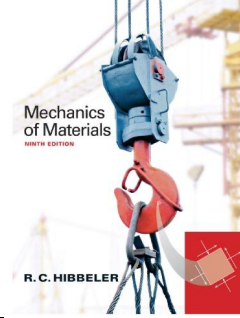
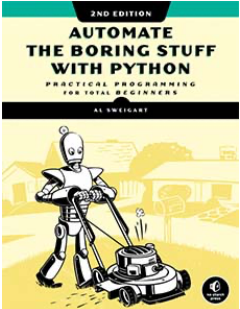
DAILY SCHEDULE

Day	Time	Description
Tuesday	10:30 pm	Lecture in HSSN 216
	12:30 pm	Office Hours in M302
	1:30 pm	Laboratory in M302
Thursday	10:30 am	Lecture in HSSN 216

Applied Matls Sci Eng Fall 2023

MASE 6401 CRN: 15711, MME 5390 CRN: 13616

MATERIALS

	<p>-TEXTBOOK - Required Statics and Mechanics of Materials (5th Edition) By: Russell C. Hibbeler</p> <p>Print ISBN: 9780134382593, 0134382595</p>
	<p>-TEXTBOOK – Required By Norman Dowling</p> <p>ISBN-13 : 978-0131395060</p>
	<p>-TEXTBOOK Optional By: Russell C. Hibbeler Ninth Edition (available used) ISBN-13: 9780133254426</p>
	<p>FREE TEXTBOOK! Automate the Boring Stuff with Python By Al Sweigart.</p> <p>https://automatetheboringstuff.com/</p>

ENGINEERING OR GRAPHING PAPER

<https://www.walmart.com/ip/Oxford-Filler-Paper-8-1-2-x-11-4-x-4-Graph-Rule-3-Hole-Punched-Loose-Leaf-Paper-for-3-Ring-Binders-400-Sheets-Per-Pack-62360/944735459>

Applied Matls Sci Eng Fall 2023

MASE 6401 CRN: 15711, MME 5390 CRN: 13616

This particular paper is not required but this is the most cost-effective solution that I have found.

CALCULATORS

TA-83 or equivalent graphing calculator

COURSE OUTLINE*

Topic	Chapters	Description
Mathematical Foundations in Statics and Mechanics	2,3,4,5 (Hibbeler)	Scalar and Vector Operations Dot Product Cross Product Force Vectors Force System Resultants (Principle of Moments) Shear and Moment Diagrams
Midterm 1		
Mechanics of Materials	7, 14, 6 (Hibbeler)	Stress and Strain Stress Transformations Center of Gravity and Moment of Inertia
Midterm 2		
Experimental Mechanics	9,10, 11, 12, 13,16	Axial Loading, Bending, Torsion Analysis of Normal and Shear Stresses in Cantilever Bending, Three and Four-point Bending
Deformation and Yield	Dowling	
Final Exam		

Applied Matls Sci Eng Fall 2023

MASE 6401 CRN: 15711, MME 5390 CRN: 13616

GRADING

Description	Percentage
Homework and Laboratory	40%
Quizzes	10%
Midterm 1	15%
Midterm 2	15%
Final	20%

Rule of 2!

I will drop the 2 lowest grades on your reading assignments, laboratory assignments, homework and quizzes.

You will lose 50% of the credit for late assignments. Don't ask if the deadline can be extended. If the grade on a particular assignment is the lowest, it will be dropped but no other exceptions will be made. Once a particular assignment has been graded, late submissions will receive a zero.

GRADED ASSIGNMENTS

The homework will be submitted to the instructor via email as a jupyter notebook (*.ipynb) or *.pdf file with the following name structure:

Lastname_Firstname_HW#X_DUE_DATE + (file extension)

The DATE should be in the following format:
YEAR MONTH DAY of the submission date

Example: Schuster_Brian_HW#1_20210201.pdf

Applied Matls Sci Eng Fall 2023

MASE 6401 CRN: 15711, MME 5390 CRN: 13616

TECHNOLOGY REQUIREMENTS

Homework, reading assessments and laboratory assignments will be submitted using the Blackboard learning management system. Ensure your UTEP e-mail account is working and that you have access to the Web and a stable web browser. Please test your preferred internet browser to ensure full compatibility with Blackboard and Blackboard Collaboration Ultra. Please reach out to the UTEP Helpdesk and Instructional Team early in first week of the semester if you have any technical difficulties.

You will need to have access to a computer/laptop, scanner, a webcam, and a microphone. IF YOU DO NOT HAVE A SCANNER, YOU CAN OPT FOR APPS LIKE CAMSCANNER TO SCAN YOUR WORK. You will require access to Adobe Acrobat Reader and Microsoft Office or [Microsoft Office 365](#). Check that your computer hardware and software are up-to-date and able to access all parts of the course.

IMPORTANT: If you encounter technical difficulties beyond your scope of troubleshooting, please contact the UTEP [Help Desk](#) as they are trained specifically in assisting with technological needs of students. Please do not contact me for this type of assistance. The Help Desk is much better equipped than your Instructional Team!

EXCUSED ABSENCES AND/OR COURSE DROP POLICY

According to UTEP Curriculum and Classroom Policies, "When, in the judgment of the instructor, a student has been absent to such a degree as to impair his or her status relative to credit for the course, the instructor may drop the student from the class with a grade of "W" before the course drop deadline and with a grade of "F" after the course drop deadline." See academic regulations in the UTEP Undergraduate Catalog for a list of excuse absences. Therefore, if I find that, due to non-performance in the course, you are at risk of failing, I will drop you from the course. I will provide 24 hours advance notice via email.

OR

I will not drop you from the course. However, if you feel that you are unable to complete the course successfully, please let me know and then contact the [Registrar's Office](#) to initiate the drop process. If you do not, you are at risk of receiving an "F" for the course.

DEADLINES, LATE WORK, AND ABSENCE POLICY

See the weekly announcements on Blackboard for the due date and time for your homework assignments, quizzes and other coursework.

Make-up work will be given *only* in the case of a *documented* emergency. Note that make-up work may be in a different format than the original work, may require more intensive preparation, and may be graded with penalty points. If you miss an assignment and the reason is not considered excusable, you will receive a zero. You will lose 50% off of late assignments. Once

Applied Matls Sci Eng Fall 2023

MASE 6401 CRN: 15711, MME 5390 CRN: 13616

these the assignments for the rest of the class have been graded, then you will be assigned a zero for that assignment. It is therefore important to reach out to me—in advance if at all possible—and explain with proper documentation why you missed a given course requirement. Once a deadline has been established for make-up work, no further extensions or exceptions will be granted.

Give yourself plenty of time to submit your coursework to avoid technical issues near deadlines.

INCOMPLETE GRADE POLICY

Incomplete grades may be requested only in exceptional circumstances after you have completed at least half of the course requirements. Talk to me immediately if you believe an incomplete is warranted. If granted, we will establish a contract of work to be completed with deadlines.

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. Students requesting an accommodation based on a disability must register with the [UTEP Center for Accommodations and Support Services](#) (CASS).

Contact the Center for Accommodations and Support Services at 915-747-5148, or email them at cass@utep.edu, or apply for accommodations online via the [CASS portal](#).

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. All suspected violations of academic integrity at The University of Texas at El Paso must be reported to the [Office of Student Conduct and Conflict Resolution \(OSCCR\)](#) for possible disciplinary action. To learn more, please visit [HOOP: Student Conduct and Discipline](#).

CLASS RECORDINGS

In the event that virtual courses are used in this class (not presently planned but could be exercised depending upon the course of the pandemic), the use of recordings will enable you to have access to class lectures, group discussions, and so on in the event you miss a synchronous

Applied Matls Sci Eng Fall 2023

MASE 6401 CRN: 15711, MME 5390 CRN: 13616

or in-person class meeting due to illness or other extenuating circumstance. Our use of such technology is governed by the Federal Educational Rights and Privacy Act (FERPA) and UTEP's acceptable-use policy. A recording of class sessions will be kept and stored by UTEP, in accordance with FERPA and UTEP policies. Your instructor will not share the recordings of your class activities outside of course participants, which include your fellow students, teaching assistants, or graduate assistants, and any guest faculty or community-based learning partners with whom we may engage during a class session. **You may not share recordings outside of this course.** Doing so may result in disciplinary action.

COPYRIGHT STATEMENT FOR COURSE MATERIALS

All materials used in this course are protected by copyright law. The course materials are only for the use of students currently enrolled in this course and only for the purpose of this course. They may not be further disseminated.

COVID-19 ACCOMMODATIONS

Students are not permitted on campus when they have a positive COVID-19 test, exposure or symptoms. If you are not permitted on campus, you should contact me as soon as possible so we can arrange necessary and appropriate accommodations.

(classes with on-campus meetings) Students who are considered high risk according to CDC guidelines and/or those who live with individuals who are considered high risk may contact [Center for Accommodations and Support Services](#) (CASS) to discuss temporary accommodations for on-campus courses and activities.

COVID-19 PRECAUTIONS

You must STAY AT HOME and REPORT if you (1) have been diagnosed with COVID-19, (2) are experiencing COVID-19 symptoms, or (3) have had recent contact with a person who has received a positive coronavirus test. Reports should be made at [screening.utep.edu](#). If you know of anyone who should report any of these three criteria, you should encourage them to report. If the individual cannot report, you can report on their behalf by sending an email to COVIDaction@utep.edu.

For each day that you attend campus—for any reason—you must complete the questions on the UTEP screening website ([screening.utep.edu](#)) prior to arriving on campus. The website will verify if you are permitted to come to campus. Under no circumstances should anyone come to class when feeling ill or exhibiting any of the known COVID-19 symptoms. If you are feeling unwell, please let me know as soon as possible, and alternative instruction will be provided. Students are advised to minimize the number of encounters with others to avoid infection.

Wear face coverings when in common areas of campus or when others are present. You must wear a face covering over your nose and mouth at all times in this class. If you choose not to wear a face covering, you may not enter the classroom. If you remove your face covering, you will be asked to put it on or leave the classroom. Students who refuse to wear a face covering and follow preventive COVID-19 guidelines will be dismissed from the class and will be subject to disciplinary action according to Section 1.2.3 *Health and Safety* and Section 1.2.2.5 *Disruptions* in the UTEP Handbook of Operating Procedures.