

MECE 3321: Mechanics of Solids – Fall 2022

Course Information

Class Schedule/Room:	TR 9:30 AM – 10:45 AM/EENGR 1.268 TR 11:00 AM – 12:15 AM/EENGR 1.272
Instructor:	Samantha Ramirez
Office:	EENGR 3.261
Office Hours:	https://utrgv.zoom.us/j/84082209952
Email:	samantha.ramirez@utrgv.edu
Website:	http://faculty.utrgv.edu/samantha.ramirez/
<u>Pre-requisites:</u>	“C” or better in Calculus II (MATH 2414) and Statics (MECE 2301) and Engineering Materials (MECE 2340)
<u>Catalog Description:</u>	This course covers internal forces and deformation of solids, concepts of stress and strain, formulas for stress and deflection for elastic bars, shafts, and beams, stress and strain transformation, and theories of failure.
<u>Required Materials:</u>	McGraw-Hill Connect (see Homework), non-programmable calculator, web cam, device for scanning
<u>Recommended Textbook:</u>	<i>Mechanics of Materials</i> , Beer, McGraw Hill Education, New York, New York. (8 th edition) <i>Mechanics of Materials</i> , Hibbeler, R.C., Prentice Hall Inc., Upper Saddle River, New Jersey. (10 th edition)
<u>Course Modality:</u>	Traditional face-to-face (TR) See Attendance and Classroom Etiquette for more information.

Course Outcomes and Assessment:

The student should be able to

1. Define the study of mechanics of materials and the concepts of internal loadings, normal and shear stress, and allowable stress (factor of safety); and design members subjected to an axial load or direct shear.
2. Define the concepts of normal and shear strain and be able to calculate the normal and shear strain in a structure under axial loading.
3. Define the concepts of the stress-strain diagram (including the difference of stress-strain diagrams between various materials) and Poisson's ratio.
4. Design statically determinate and indeterminate axially loaded members including the case of thermal stresses.
5. Design statically determinate and indeterminate torsional loaded members including noncircular shafts.
6. Draw shear and bending moment diagrams for beams and shafts using the analytical and graphical method and calculate normal and shear stresses for straight members with symmetric cross-sections subjected to bending loads.
7. Calculate the shear stress in a beam having a prismatic cross section and made from a homogeneous linear elastic material.
8. Derive the equation of the elastic curve for deformation of a member using superposition (including statically indeterminate beams) and use this equation to find the deflection and/or slope at any point along the length of the member.
9. Analyze members or structures where there are combinations of various different types of loadings (axial, torsion, bending, and shear) applied simultaneously to a member or structure and solve for circumferential (or hoop) stress and longitudinal (or axial direction) stress in "thin" walled vessels under pressure.

Grading Policy

3 Module Exams	45% (15% each)
Comprehensive Final Exam	20%
Quizzes	15%
Homework	15%
Supplemental Instruction	5%

EXAMS

You will have a total of 5 exams in this course.

- You will have a pre-test that covers prerequisite content (Calculus II, Statics, Engineering Materials). This will be an **online exam** in McGraw-Hill Connect that you must complete by Tuesday, 9/6/22 by 9:00 AM. It will count for 4 quiz grades.
- You will have 3 module exams that will be administered **in-person** outside of class on the dates and times shown in the Course Calendar. Please make appropriate accommodations for these 3 exams since you know about them on Day 1 of this semester.
- Your final exam will be comprehensive (Modules 1-4).

Students will only be allowed to use the provided exam booklet, a non-programmable calculator, and something to write with for the exam. Absolutely no bathroom breaks, programmable calculators, calculator covers, cell phones, laptops, iPads, iPods, or any other smart technology devices are allowed during exams.

Once an exam is graded and returned to you, you only have 24 hours to contest your exam grade. Please compare your graded exam to the exam solution provided to you in Blackboard. If, after doing so, you think a grading mistake was made, please email me to let me know. I will review my scan of your graded work and let you know my decision.

In the event that I, or another faculty member, am not able to administer an exam in person on the scheduled day, I will administer the exam via Zoom. Students will be required to attend a special Zoom session emailed to you for the duration of the exam where they will be required to have a camera on to be monitored. Students will only be allowed to use the provided exam booklet for the exam. All exam work will be scanned and uploaded in Blackboard for grading.

In the event that you are not allowed on campus to take the scheduled exam due to COVID, you will need to provide proof from the UTRGV COVID Response Team. Once approved, students will be required to attend a special Zoom session emailed to you for the duration of the exam where they will be required to have a camera on to be monitored. Students will only be allowed to use the provided exam booklet for the exam. All exam work will be scanned and uploaded in Blackboard for grading.

QUIZZES

- You will have a quiz every Tuesday using Quizizz (an app). The quiz will open after class and is due by 11:30 PM.
- SmartBook assignments in MH Connect will count as quiz grades. These assignments must be completed before class begins.

HOMEWORK

Required McGraw Hill Connect will be utilized for homework assignments.

- Registration link is found in BlackBoard Learn.
- **Homework will be due at 11:30 PM.** Absolutely no late assignments will be accepted
- It is suggested to work problems out using the following format on the MECE Homework Paper (Found on my website), engineering paper, or graph paper.
 - Problem statement & picture (hand drawn or copy/pasted)
 - Summarized knowns, unknowns to be found, and possible equations to use
 - Free body diagram(s)
 - Calculations in appropriate units
 - Final boxed answer in correct units
- Reading assignments in Connect will be used as extra credit on module exams. The amount of extra credit is to be determined by me at the end of the semester.
- You will be assigned 1-2 videos to watch outside of class as homework before class begins. You will be required to upload your notes from those videos by our scheduled class time.

Attendance & Classroom Etiquette

- This course is scheduled as a traditional face-to-face class and will be held as. I will not hold live Zoom sessions during our scheduled class time, but pre-recorded videos will be available to you sometime after the course content is covered.

- In the event that I am not able to attend f2f classes due to illness, I will hold online synchronous class via Zoom if I am able to. If I am also not able to hold online synchronous class, then I will assign pre-recorded lecture videos for the class day(s) until I can return to live.
- My office hours will be held via Zoom. I am typically available throughout the day when I am not holding class. If you join my office hours Zoom room, I should receive an email notification that someone is in the waiting room. Please wait for me. If I do not let you into the Zoom room after 5 minutes, then I am not available to meet. If that does happen, please email me to make an appointment.
- Attendance will be taken daily.
- If, during the semester, you fall ill and are not able to complete coursework, you will be allowed to make up any homework, quizzes, and/or exams that are missed as long as you email me letting me know about your situation and provide a doctor's excuse/test results (with your name and date of birth). Do not wait until after due dates/exam dates to let me know.

Course Calendar

There is a course calendar in Blackboard for you to use. It will show you the most up-to-date due dates and times for all assignments and exams in this course.

Module 0: Statics Review **Pre-Test: Due by 11:59 PM on Monday, 9/5/22**

Module 1: Internal Loads **Exam 1: Friday, 9/30/22 from 11 AM – 1 PM in ESCNE 2.108**

- A: Method of Sections
- B: Normal and Torsion Diagrams
- C: Shear & Bending Moment Diagrams 5.1 – 5.2

Module 2: Stress **Exam 2: Friday, 11/4/22 from 11 AM – 1 PM in ESCNE 2.108**

- A: Stress, Stress Concentrations 1.2, 1.4, 1.55, 2.10, 2.11
- B: Shear Stress Due to Torsion 3.1A, 3.1C, 3.4, 3.5
- C: Normal Stress Due to Bending 4.1A, 4.2
- D: Shear Stress Due to Shear Force 6.1
- E: Combined Loading 8.3

Module 3: Strain **Exam 3: Friday, 12/2/22 from 11 AM – 1 PM in ESCNE 2.108**

- A: Strain 2.1A, 2.7, 2.8
- B: Axial Deformation 2.1B-F, 2.12, 2.1G, 2.4
- C: Angle of Twist 3.1B, 3.2, 3.9
- D: Beam Deflection 9.4A

Module 4: Statically Indeterminate Situations

- A: Beam Deflection 9.4B
- B: Axial and Thermal 2.2, 2.3
- C: Torsion 3.3

11 AM Class: Tuesday, 12/13/22 from 10:15 AM – 12:00 PM in EENGR 1.272

Comprehensive Final Exam 9:30 AM Class: Thursday, 12/15/22 from 8 AM -9:45 AM in EENGR 1.268

Scholastic Integrity:

Members of the UTRGV community uphold the [Vaquero Honor Code](#)'s shared values of honesty, integrity and mutual respect in our interactions and relationships. In this regard, academic integrity is fundamental in our actions, as any act of dishonesty conflicts as much with academic achievement as with the values of honesty and integrity. Violations of

academic integrity include, but are not limited to: cheating, plagiarism (including self-plagiarism), and collusion; 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 (Board of Regents Rules and Regulations, STU 02-100, and UTRGV Academic Integrity Guidelines). **All violations of Academic Integrity will be reported to Student Rights and Responsibilities through [Vaqueros Report It](#).**

Course Drops:

According to UTRGV policy, students may drop any class without penalty earning a grade of DR (drop) until the official drop date. Following that date, students must be assigned a letter grade and can no longer drop the class. Students considering dropping the class should be aware of the “3-peat rule” and the “6-drop” rule so they can recognize how dropped classes may affect their academic success. The 6-drop rule refers to Texas law that dictates that undergraduate students may not drop more than six courses during their undergraduate career. Courses dropped at other Texas public higher education institutions will count toward the six-course drop limit. The 3-peat rule refers to additional fees charged to students who take the same class for the third time.

Students can withdraw from a course through the *Office of the Registrar* on or prior to:

- July 19, 2022: Last day to drop a class before it appears on the transcript and count toward the “6-drop” limit.
- August 10, 2022: Drop/Withdrawal Deadline; last day for students to drop the course and receive a “DR” grade. After this date, students will be assigned a letter grade for the course that will count on the GPA.

Students with Disabilities:

Students with a documented disability (physical, psychological, learning, or other disability which affects academic performance) who would like to receive reasonable academic accommodations should contact **Student Accessibility Services (SAS)** for additional information. In order for accommodation requests to be considered for approval, the student must apply using the [mySAS portal](#) and is responsible for providing sufficient documentation of the disability to SAS. Students are required to participate in an interactive discussion, or an intake appointment, with SAS staff. Accommodations may be requested at any time but are not retroactive, meaning they are valid once approved by SAS. Please contact SAS early in the semester/module for guidance. Students who experience a broken bone, severe injury, or undergo surgery may also be eligible for temporary accommodations.

Pregnancy, Pregnancy-related, and Parenting Accommodations

Title IX of the Education Amendments of 1972 prohibits sex discrimination, which includes discrimination based on pregnancy, marital status, or parental status. Students seeking accommodations related to pregnancy, pregnancy-related condition, or parenting (reasonably immediate postpartum period) should submit the request using the form found at [Pregnancy and Parenting | UTRGV](#).

Student Accessibility Services staff can be contacted at either campus:

Brownsville Campus:

Music and Learning Center building (BMSLC, 1.107), phone (956) 882-7374, email ability@utrgv.edu.

Edinburg Campus:

University Center (EUCTR, 108), phone (956) 665-7005, email ability@utrgv.edu.

Sexual Misconduct and Mandatory Reporting:

In accordance with UT System regulations, your instructor is a “Responsible Employee” for reporting purposes under Title IX regulations and so must report to the Office of Institutional Equity & Diversity (OIED@utrgv.edu) any instance, occurring during a student’s time in college, of sexual misconduct, which includes sexual assault, stalking, dating violence, domestic violence, and sexual harassment, about which she/he becomes aware during this course through writing, discussion, or personal disclosure. More information can be found at www.utrgv.edu/equity, including confidential resources available on campus. The faculty and staff of UTRGV actively strive to provide a learning, working,

and living environment that promotes personal integrity, civility, and mutual respect that is free from sexual misconduct, discrimination, and all forms of violence. If students, faculty, or staff would like confidential assistance, or have questions, they can contact OVAVP (Office for Victim Advocacy & Violence Prevention) at (956) 665-8287, (956) 882-8282, or OVAVP@utrgv.edu.

Course Evaluation:

Students are encouraged to complete an ONLINE evaluation of this course, accessed through your UTRGV account (<http://my.utrgv.edu>); you will be contacted through email with further instructions. Students who complete their evaluations will have priority access to their grades. Online evaluations will be available on or about:

Fall Module 1 (7 weeks)	October 12 – 18, 2022
Fall Regular Term 2022	November 18 – December 7, 2022
Fall Module 2 (7 weeks)	December 7 – 13, 2022

Student Services:

Students who demonstrate financial need have a variety of options when it comes to paying for college costs, such as scholarships, grants, loans and work-study. Students should visit the Student Services Center (U Central) for additional information. U Central is located in BMAIN 1.100 (Brownsville) or ESSBL 1.145 (Edinburg) or can be reached by email (ucentral@utrgv.edu) or telephone: (956) 882-4026. In addition to financial aid, U Central can assist students with registration and admissions.

Students seeking academic help in their studies can use university resources in addition to an instructor's office hours. University Resources include the Advising Center, Career Center, Counseling Center, Learning Center, and Writing Center. The centers provide services such as tutoring, writing help, counseling services, critical thinking, study skills, degree planning, and student employment. In addition, services such as the Food Pantry are also provided. Locations are listed below.

Center Name	Brownsville Campus	Edinburg Campus
Advising Center AcademicAdvising@utrgv.edu	BMAIN 1.400 (956) 665-7120	EITTB 1.000 (956) 665-7120
Career Center CareerCenter@utrgv.edu	BINAB 1.105 (956) 882-5627	ESTAC 2.101 (956) 665-2243
Counseling Center Counseling@utrgv.edu Mental Health Counseling and Related Services List	BSTUN 2.10 (956) 882-3897	EUCTR 109 (956) 665-2574
Food Pantry FoodPantry@utrgv.edu	BCAVL 101 & 102 (956) 882-7126	EUCTR 114 (956) 665-3663
Learning Center LearningCenter@utrgv.edu	BMSLC 2.118 (956) 882-8208	ELCTR 100 (956) 665-2585
University Library circulation@utrgv.edu www.utrgv.edu/library	BLIBR (956) 882-8221	ELIBR (956) 665-2005
Writing Center WC@utrgv.edu	BLIBR 3.206 (956) 882-7065	ESTAC 3.119 (956) 665-2538