

**MENG 3306 – Mechanics of Materials**  
**Course Syllabus**

Semester / Year	Fall 2025
Catalog Description	Stress and strain; uniaxially loaded members; centroids and area moments of inertia; normal and shear stresses; beam deflections; buckling of columns; pressure vessels; combined stresses; failure criteria. Three hours of lecture per week.
Prerequisites	Grade C or better in ENGR 2301 Mechanics - Statics
Section Number	051 and 052
Instructor Name	Ola Al-Shalash
Contact Information	<b>Office:</b> Houston Engineering Center: HEC A212 <b>E-mail:</b> <a href="mailto:osalshalash@uttyler.edu">osalshalash@uttyler.edu</a>
Class Type / Location	Hybrid <b>Location:</b> <b>051:</b> Houston Engineering Ctr 0C204 <b>052:</b> Ratliff Building North 03038
Class Time	Tuesday & Thursday 9:30 am – 10:50 am
Office Hours	<b>Tuesdays and Thursdays</b> 11:00 am – 12:30 pm or by appointment
No. of Credits	3 credits
Required Textbook	<b>Mechanics of Materials</b> , 10 <sup>th</sup> edition, by R. C. Hibbeler
Optional References	N/A
Additional Rules and Requirements	<ul style="list-style-type: none"> <li>- Handouts and manuals posted on Canvas</li> <li>- Pre-requisite knowledge:</li> <li>- Calculus (integration and differentiation) and Linear Algebra (systems of equations)</li> <li>- Vector Analysis (understanding of vector representations and operations)</li> <li>- Statics (free body diagrams and equilibrium analysis)</li> <li>- AI is permitted only for specific assignments or situations, and appropriate acknowledgment is required.</li> <li>- It is NOT permitted to use AI for solving homework, quiz, or exam questions unless explicit written approval is given in the assignment instructions. However, it is permitted to ask AI chatbots general questions about how to solve certain types of problems if the chatbot is not providing the solution.</li> </ul>

Evaluation Method	<p>Grading:</p> <p>Exam I <b>25 %</b></p> <p>Exam II <b>25 %</b></p> <p>Final Exam <b>30 %</b></p> <p>Homework <b>20 %</b></p>
Grading Policy / Scale	<p>Letter grades, <i>scale</i>:  <b>A: 90 – 100; B: 80 – 89; C: 70 – 79; D: 60 – 69; F: &lt; 60</b></p> <p><b>Grade appeal</b>  Grades can be appealed by sending an email then meeting the instructor during office hours, but no later than three days after the grade has been posted. Moreover, students may appeal any grade reduction to the instructor if valid excuse with documentation is provided.</p>
Important Events / Dates	<p><b>Census date:</b> September 8</p> <p><b>Last day to withdraw:</b> November 3</p> <p><b>Exam I:</b> Thursday, <b>October 9</b> during class time</p> <p><b>Exam II:</b> Thursday, <b>November 20</b> during class time</p> <p><b>Final Exam:</b> Thursday, <b>December 11 @ 9:30 a.m.-11:30 a.m.</b>  <a href="https://www.uttlyer.edu/academics/academic-calendar-25-26/academic-calendar-15-week-and-summer.php">https://www.uttlyer.edu/academics/academic-calendar-25-26/academic-calendar-15-week-and-summer.php</a></p>
Attendance / Makeup policy/ other rules	<ul style="list-style-type: none"> <li>Attendance is expected per university policy. Regular attendance is highly recommended whenever we have an in-person or zoom meeting. It is imperative if you want to do well in this course.</li> <li>Attendance will be taken and regularly checked using Canvas. Students who come to class after attendance is taken will be considered absent.</li> <li>In case you have to miss a class, it is your responsibility to keep up with the class work and be informed of all the announcements made in the class.</li> <li>Students will not be permitted to leave the classroom during lectures except for extreme emergencies.</li> <li>Lectures and everything regarding the course are posted on Canvas, make sure to check your course canvas regularly. It is your responsibility to keep up with the class work and be informed of all the announcements made on canvas.</li> <li>No email submission of assignments, HomeWorks, etc. All assignments <b>MUST</b> be submitted to Canvas for grading.</li> <li>No makeup unless students provide a university accepted excused absence with proper documentation justifying the absence.</li> <li>Questions involving knowledge covered in class will be answered if the student proves that they have tried to come up with the answer. Solutions to homework will not be given. However, students can work on the right solution by checking their work with the instructor.</li> <li>Students with SAR status should contact the UT Tyler Office of Student Accessibility and Resources for exam arrangements.</li> </ul>



- Any minor violation of the Student Behavior (see below) by a student as deemed by the instructor will result in a full letter grade reduction for each incident while any major violation(s), such as cheating and plagiarism, by a student as deemed by the instructor will result in automatic failing grade in the course.
- The use of cellular phones during lectures is prohibited. If a student uses the cellular phone (call, text, internet), he/she will be asked to leave the classroom and penalties of missing the class will apply. It is highly recommended to keep your cellular phone off.
- No food is allowed in the classroom.
- Late submissions of assignments/ Homework (e.g. if due at 11:59:00 pm, then any time after such as 11:59:30 pm is late) will result in **20 % deduction** per day from the graded score.
- Given this is a professional, educational setting you are expected to dress and behave appropriately. A positive, mature attitude/behavior is expected from the students in all classes. Students disturbing directly or indirectly the class or other students will be asked to leave the classroom with the consequences associated to an absence.
- Since the mechanical engineering program is intended to train students to be engineering professionals, it is expected that all work products (e.g. homework, lab reports, projects, presentations, etc.) submitted for class to be of professional quality. Failure to submit professional quality work may result in grade reductions, regardless of whether any grading scheme or rubric for an assignment explicitly includes professionalism in the grade calculation.
- Students are encouraged to utilize any tutoring services available if needed and come prepared to each week's class. Each student is expected to work with the group in a professional manner in case of any group activities. It is important to communicate clearly and professionally of any concerns or issues to the instructor.
- Canvas should be the primary mode of contacting the instructor so check the Canvas announcements and discussion board to check for information about the course. In addition, university provided email should be the official communication method and you should check your email regularly. Use the above email address or Canvas messaging if you want to email the instructor. Please use **MENG 3306- your section, your question or concern title** in the email subject line. Please allow the instructor at least one to two business days to respond to your email. Emails with improper language will not be answered. Emails with same concerns or questions from multiple students will be answered/covered during class time.
- The syllabus is subject to change during the semester as deemed necessary. Students will be notified for any major changes.

Course Learning Outcomes / ABET & PEOs relation	<p>By the end of this course, students will be able to:</p> <ol style="list-style-type: none"> <li>1. Use external loads including axial force, moment, torque, shear force to determine internal forces and moments for a variety of structures and structural elements.</li> <li>2. Determine the state of stress at a point different stress configurations and combined loading and find principal stresses and directions both analytically and graphically using the Mohr's circle diagram.</li> <li>3. Relate stress to strain using material properties and analyze the state of strain at a point and use strains to calculate deformations.</li> <li>4. Design shafts and beams and use load-deformation equations and other methods to calculate beam deflections.</li> </ol>
Tentative Topics	<ul style="list-style-type: none"> <li>• Normal and shear stress</li> <li>• Normal and shear strain</li> <li>• Mechanical properties of materials</li> <li>• Axial load</li> <li>• Torsion</li> <li>• Bending</li> <li>• Stress and strain transformation</li> <li>• Beam and shaft design</li> <li>• Deflections of beams and shafts</li> </ul>
University Policies	<a href="https://www.utt Tyler.edu/offices/academic-affairs/files/syllabus-information.pdf">https://www.utt Tyler.edu/offices/academic-affairs/files/syllabus-information.pdf</a>
Evaluation activities	<p><b>Exams</b></p> <ul style="list-style-type: none"> <li>• There will be three exams for this course, two exams during the course and the final exam. The final exam will be comprehensive.</li> <li>• Absolutely no cell phones, graphing calculators, laptops, iPads, iPods, smart watches, or any other smart technology devices are allowed in exams and/or quizzes. In case of the Zoom class type, only the exam window is allowed on the laptop screen (more instructions will be provided before each exam if this is the case).</li> <li>• Students are not allowed to leave the examination room unless they submit their exam paper; scan and submit to Canvas in case of Zoom class type.</li> <li>• Makeup exams for documented emergencies only.</li> <li>• Late or no submission for the exam results in automatic grade of zero.</li> <li>• Solutions of tests (quizzes and/or exams) must be well organized and neatly presented.</li> <li>• Tests must be answered with a pencil or black ink pen. Unclear handwriting may result in a lower grade.</li> <li>• Answers reflecting the solutions manual are not considered correct and will be turned into the Dean of Students as copying.</li> </ul>



- In a Face-to-face lecture, exam grades will be returned, students will be allowed to view their exams, and the professor will keep original exams.

### Homework Policy

1. Homework will be assigned for each chapter and usually is due at the beginning of the class period unless other instructions are given. The homework problems will be posted on canvas. The hard-copy of the homework assignment has to be scanned and submitted to Canvas before class starts. It will be graded on the basis of format, grammar and spelling, technical content, and overall quality. Messy work will not be graded.
2. Students may discuss their homework solutions with one another, but each student must submit their own, **independent** solution (i.e., you may not just copy someone else's homework).
  - All homework should include a clear statement of the problem to be solved, indicating the known and unknown parameters.
  - Work should be handwritten or typed using software on a standard letter size paper.
  - Draw neat and organized **free-body diagrams**, use a straight edge if necessary.
  - Number all equations, indicate and describe variable substitutions and mathematical procedure, and **highlight** (enclose, or box) your answers.
  - Number all your solution pages and write your name on each page at the upper, left-hand corner.
  - Always indicate **appropriate units** in answer and study them to determine if it is reasonable.
  - Each problem needs to have the following: Given, Assumptions, Solutions, and a box around your final answer with the appropriate unit.
  - These instructions apply to the exams' solutions as well.

**Tentative Course Schedule**

#	Week of	Lecture Activity
1	Aug. 25	Syllabus + Static Review Chapter 1: Stress
2	Sep. 1	Chapter 1: Stress Chapter 2: Strain
3	Sep. 8	Chapter 3: Mechanical Properties of Materials
4	Sep. 15	Chapter 4: Axial Load
5	Sep. 22	Chapter 5: Torsion
6	Sep. 29	Chapter 6: Bending
7	Oct. 6	<b>Exam 1</b>
8	Oct. 13	Chapter 6: Bending
9	Oct. 20	Chapter 7: Transverse Shear
10	Oct. 27	Chapter 8: Combined Loadings
11	Nov. 3	Chapter 9: Stress Transformation
12	Nov. 10	Chapter 10: Strain Transformation
13	Nov. 17	<b>Exam 2</b>
14	Nov. 24	<b>Thanksgiving holidays – No Classes</b>
15	Dec. 1	Chapter 11: Design of Beams and Shafts Chapter 12: Deflection of Beams and Shafts
16	Dec. 8	<b>Final Exam</b> (Thursday, December 11 @ 9:30 a.m.-11:30 a.m.)