



MENG 3306 – Mechanics of Materials

Course Syllabus

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| Semester / Year | Fall 2023 |
| 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 | 030 |
| Instructor Name | Ola Al-Shalash |
| Contact Information | Office: Houston Engineering Center: HEC A212 E-mail: osalshalash@uttyler.edu |
| Class Type / Location | Face-to-face Location: HEC C204 |
| Class Time | Tuesday and Thursday 3:30 PM – 4:50 PM |
| Office Hours | Mondays: 12:20 PM – 1:50 PM Fridays: 10:45 PM – 12:15 PM or by appointment |
| No. of Credits | 3 credits |
| Required Textbook | Mechanics of Materials, 10th edition , by R. C. Hibbeler |
| Optional References | N/A |
| Additional Rules and Requirements | Handouts and manuals posted on Canvas |
| Evaluation Method | Grading: Midterm Exam 20 % Project 25 % Final Exam 25 % Homework 15 % Quizzes 10 % Course Participation & Attendance 5 % |
| Grading Policy / Scale | Letter grades, <i>scale</i> : A: 90 – 100; B: 80 – 89; C: 70 – 79; D: 60 – 69; F: < 60 Grade appeal 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. |



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| <p>Important Events / Dates</p> | <p>Census date: September 1 Last day to withdraw: October 30 Midterm Exam: Week of October 9 Project due: Week of November 27 Final Exam: During finals week</p> |
| <p>Attendance / Makeup policy/ other rules</p> | <ul style="list-style-type: none"> • Attendance is expected per university policy. Regular attendance is highly recommended. It is imperative if you want to do well in this course. • Attendance will be taken and regularly checked using Canvas. Students who come to class after attendance is taken will be considered absent. • In case you have to miss a class, it is your responsibility to keep up with the class work and be informed of all announcements made in the class. • Students will not be permitted to leave the classroom during lectures except for extreme emergencies. • No email submission of assignments, HomeWorks, etc. All assignments MUST be submitted to Canvas for grading. • No makeups unless students provide a university accepted excused absence with proper documentation justifying the absence. • Student with SAR status should contact the UT Tyler Office of Student Accessibility and Resources for exam arrangements. • 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 the class is prohibited. • 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. • The syllabus is subject to change during the semester as deemed necessary. Students will be notified for any major changes. |
| <p>Course Learning Outcomes / ABET & PEOs relation</p> | <p>By the end of this course, students will be able to:</p> <ol style="list-style-type: none"> 1. Use various external loads to determine internal forces and related stress and deformation for a variety of structures. 2. Determine the state of stress at a point and calculate principal stresses and directions. 3. Relate stress to strain using material properties and calculate deformations. 4. Design and analyze beams and shafts based on strength and deformation requirements. 5. Use Failure Theories to predict ductile or brittle material failure. Use elastic instability and column buckling analysis to design columns. |
| <p>Tentative Topics</p> | <ul style="list-style-type: none"> • Normal and shear stress • Normal and shear strain • Mechanical properties of materials • Axial load |



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| | <ul style="list-style-type: none"> • Torsion • Bending • Stress and strain transformation • Beam and shaft design • Deflections of beams and shafts |
| University Policies | https://www.uttyler.edu/academic-affairs/files/syllabus_information_2021.pdf |

Tentative Course Schedule

| # | Week of | Lecture Activity |
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| 1 | Aug. 21 | Syllabus + Static Review Chapter 1: Stress |
| 2 | Aug. 28 | Chapter 1: Stress Chapter 2: Strain |
| 3 | Sep. 4 | Monday, Sep. 4: Labor Day holiday - No Classes Chapter 3: Mechanical Properties of Materials |
| 4 | Sep. 11 | Chapter 3: Mechanical Properties of Materials (Project introduction) |
| 5 | Sep. 18 | Chapter 4: Axial Load |
| 6 | Sep. 25 | Chapter 5: Torsion (Project Proposal due) |
| 7 | Oct. 2 | Chapter 6: Bending |
| 8 | Oct. 9 | Midterm Exam |
| 9 | Oct. 16 | Chapter 7: Transverse Shear |
| 10 | Oct. 23 | Chapter 8: Combined Loadings |
| 11 | Oct. 30 | Chapter 9: Stress Transformation |
| 12 | Nov. 6 | Chapter 10: Strain Transformation |
| 13 | Nov. 13 | Chapter 11: Design of Beams and Shafts Chapter 12: Deflection of Beams and Shafts |
| 14 | Nov. 20 | Thanksgiving holidays – No Classes |
| 15 | Nov. 27 | Project due |
| 16 | Dec. 4 | Final Exam Week |