CEN 202
Mechanics of Materials
Summer 2019 – Session II

Course Description: The behavior of materials and members under axial load, torsion, flexure, shear and combined loads, including the deflection of beams and buckling of columns. The relationship between stress and strain, principal stresses and strains and yield and fracture criteria are discussed.

Student Learning Outcomes:
• Find average stresses in connections: net tension, compression, shear and bearing.
• Compute stresses on oblique planes.
• Use the concept of Factor of Safety in design problems.
• Compute strain and volume changes due to deformation.
• Understand stress-strain relationship and determine material properties under tensile loading.
• Understand stress and deformation of statically indeterminate members.
• Use generalized Hooke's Law including temperature to calculate deformation and stress.
• Calculate the shear stress, deformation of statically determinant and indeterminate torsion of shafts.
• Select appropriate sized shafts based upon torque, power and elastic deformation requirements.
• Calculate stresses for symmetrical bending of the beams.
• Compute Principal Stresses for plane stress conditions.
• Compute stresses of axisymmetric thin vessels.
• Use Mohr's Circle for stress in arbitrary directions
• Draw accurately scaled shear and bending moment diagrams.
• Calculate beam deflections for statically determinate and indeterminate beams.
• Basic concepts and analysis techniques of structural stability emphasizing the buckling of columns

Instructor: Sheikh Fahad Ferdous
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Office Hours: TWH from 12 – 1 pm, or by appointment
Class Meeting: TWH, from 9 am – 12 pm at SENG 117


Prerequisites
EGR 241 – Eng. Mechanics I

Chapters covered from the above textbook
Chapter-1, Chapter-2, Chapter-3, Chapter-4, Chapter-5, Chapter-7, Chapter-9, Chapte-10.
**Course Grading Policy:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>HW assignments</td>
<td>30%</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>30%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>40%</td>
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</tbody>
</table>

**Semester Total** 100%

**Note**
If due to a medical emergency or any other legitimate reason, a student is not able to hand in a homework assignment by the due date or take an exam, the course instructor should be informed as soon as possible to make up the missed work.

**Course Policy:**

1. No make-up of regular exams or the final exam will be allowed unless a valid, documented excuse is presented within 2 days of missing the exam. The course instructor will be the sole person determining the validity of excuses. It is the responsibility of the student to approach the instructor for a make-up examination.

2. Please turn in all assignments on time. What constitutes “on time”? Assignments should reach me, in person, within the first 5 minutes of the class meeting on the assignment’s due date.

3. Any form of academic dishonesty in exams and/or homework will result in the issuance of an F grade for the course and possibly other departmental action. See Student Handbook and/or UMD General Catalogue for definition of academic dishonesty. The UMD policy on academic integrity can be found at [http://www.umassd.edu/policies/activepolicylist/academicaffairs/academicintegritypolicyandreportingform/](http://www.umassd.edu/policies/activepolicylist/academicaffairs/academicintegritypolicyandreportingform/).

4. Class attendance will be taken. Attendance will not count toward your final grade; however, students who skip lectures seldom do well on their examinations.

5. Please check MyCourses regularly for updated postings. Homework assignments, solutions, handouts, grades, and other course materials will be added to the course’s site throughout the semester.

6. The Center for Access and Success provides many services for students with disabilities. See [http://www.umassd.edu/dss/services.cfm](http://www.umassd.edu/dss/services.cfm)
   Center for Access and Success
   Pine Dale Hall, Room 130
   Phone: 508-999-8711
7. According to the university catalogue, an incomplete grade may be given only in exceptional circumstances. The complete policy can be found at

http://catalog.umassd.edu/content.php?catoid=1&navoid=37#Grades_and_Grading_System

8. For electronic communication, I will send emails to your university email address. University policy specifies that students are responsible for all official correspondence sent to their standard UMD email address (@umassd.edu).

9. **NOT CHECKING UMD EMAIL OR MYCOURSES NOTICES IS NOT AN EXCUSE FOR “I WAS NOT INFORMED”**.

**Classroom Policies**
Every student is expected to respect the following rules.

- No cell phones should be used during lectures. They must be put on silence.
- No laptops or any other electronic device should be used during lectures unless otherwise instructed.
- Every student should be seated within 5 minutes after class starts.
- If a student has a question during lecture, it should be asked from the instructor and not be discussed with a classmate while the instructor is teaching.

**Email Requests**
When sending an email, please specify the course name in the subject area.
As the instructor for this course, I reserve the right to adjust this schedule in any way that serves the educational needs of the students enrolled in this course. –Sheikh F Ferdous

<table>
<thead>
<tr>
<th>Day</th>
<th>Date</th>
<th>Chapter from textbook</th>
<th>HW / Quiz</th>
</tr>
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</table>
| Tu  | Jul 16 | ✓ Introduction and Syllabus Discussion  
✓ 1.1-1.2 (concept of stress) | HW 1 Assigned |
| We | Jul 17 | ✓ 1.3-1.5 (concept of stress) | |
| Th | Jul 18 | ✓ 2.1-2.5 (stress and strain: axial loading) | |
| Tu | Jul 23 | ✓ 2.7-2.11 (stress and strain: axial loading) | HW 1 Due, HW 2 Assigned |
| We | Jul 24 | ✓ 3.1-3.3 (Torsion) | |
| Th | Jul 25 | ✓ 3.4-3.5 (Torsion)  
✓ **Review for Midterm Exam** | |
| Tu | Jul 30 | ✓ **Midterm Exam**  
✓ 7.1-7.3 (Stress transformations- plane stress) | HW 2 Due, HW 3 Assigned |
| We | Jul 31 | ✓ 7.4 (Mohr’s Circle)  
✓ 7.6 (Pressure Vessel) | |
| Th | Aug 01 | ✓ 4.1-4.5 (Pure Bending) | |
| Tu | Aug 06 | ✓ 4.7-4.9 (Pure Bending)  
✓ 5.1-5.3 (SF & BM diagrams) | HW 3 Due, HW 4 Assigned |
| We | Aug 07 | ✓ 5.1-5.3 (cont’d)  
✓ 9.1-9.4 (Deflection of beams) | |
| Th | Aug 08 | ✓ 9.1-9.4 (cont’d)  
✓ 10.1-10.3 (Column) | |
| Tu | Aug 13 | ✓ 10.1-10.3 (cont’d)  
✓ **Review of the course** | HW 4 Due |
| We | Aug 14 | **FINAL EXAM** | |