Sabanci University  
Faculty of Engineering and Natural Sciences  

ME 301- Mechanical Systems I  

Instructor: Güllü Kızıltas Şendur gkiziltas@sabanciuniv.edu  
Teaching Assistants: Ata Alipoor, Ahmet Can Suyun, Mehmet Serhat Aydin, Ece Naz Erülker  

Lecture Hours and Place: T:11:40-13:30 , Th:9:40-10:30 ZOOM ONLINE  
https://sabanciuniv.zoom.us/j/95542800402?pwd=bmFCczAwY1BGeTVSaDIhbU5MV2dadz09  
Meeting ID: 955 4280 0402 Passcode: 639883  
Recitations: F: 11:40-12:30 ZOOM ONLINE TBA  
Office Hours: TBA  
References:  

Course Objectives:  
This course introduces fundamental principles and methods of structural mechanics. Topics covered include: stresses and strains in structural elements, states of stress (shear, bending, torsion), statically indeterminate systems, displacements and deformations, deflections with simple loadings, superposition techniques, thermal stresses, combined stresses, Mohr’s circle, combined loadings, buckling, energy methods, elastic stability, and approximate methods. The course objective can be listed as to:  
1. Introduce students to mechanics of materials and fundamentals of strength of materials,  
2. Understand the sources and relationship between strain and stress and learn how to calculate them given various loading conditions  
3. Apply computational techniques, such as Mohr’s circle, to solve mechanics problems  
4. Learn how to conduct mechanical component design based on stress and deflection analysis  
5. Calculate deflections of structural elements under basic loading.  
6. Introduce students to the principles of design for static failure  
7. Learn how to analyze a given solid mechanics problem in a simple and logical manner and using fundamental concepts to find its solution  

Prerequisites:  
A passing grade in ENS 204 is required  

Course Work:  
Each student’s grade in the course will be based on the following distribution:
• Homework (4x) 10% and Online Participation 5%
• Mid-Term 1 25% Tentative Date: Week of Nov. 1, during lecture
• Mid-Term 2 25% Tentative Date: Week of Dec. 6, during lecture
• Final Exam 35%

There will be two closed book MT exams, and a comprehensive final exam given during the official scheduled time as well as homework assignments. Please follow all announcements via SUCOURSE.

**Homework Policy:**

Homework will be assigned every three weeks. Homeworks will be assigned and submitted online. The solution to each problem should start at top of a new page with all solution steps shown in an easy to follow format. All units of measurement must be shown throughout the solution. The solution to each problem should be free of scratch marks with the final answer(s) boxed or clearly marked. Sloppy assignment reports will suffer a significant grade deduction even if the solution is correct.

**Syllabus Overview:**

Tentative allocation of topics throughout the semester is as follows.

<table>
<thead>
<tr>
<th>Week 1: Review and Introduction</th>
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<tbody>
<tr>
<td>Week 2: Introduction, Stress-strain, Mechanical properties of materials</td>
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<tr>
<td>Week 3: Stress-strain, Mechanical properties of materials</td>
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<td>Week 4: Axial Loading</td>
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<td>Week 5: Axial Loading</td>
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<td>Week 6: Torsion, Pure Bending</td>
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<td>Week 7: Torsion, Pure Bending</td>
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<td>Week 8: Transverse Shear</td>
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<td>Week 9: Transverse Shear</td>
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<td>Week 10: Combined Loading</td>
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<td>Week 11: Transformation of Stress, Strain</td>
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<td>Week 12: Transformation of Stress, Strain, Failure Theories</td>
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<td>Week 13-14: Deflection of beams</td>
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**Student Conduct- Academic Honesty:**

It is the responsibility of each student to adhere to the principles of academic integrity. Academic integrity means that a student is honest with him/herself, fellow students, instructors, and the University in matters concerning his or her educational endeavors. Thus, a student should not falsely claim the work of another as his/her own, or misrepresent him/herself so that the measures of his/her academic performance do not reflect his/her own work or personal knowledge. All homework and projects must be an individual effort unless specifically noted.