AME 204 Strength of Materials
Units: 3
Spring 2019—Tuesday/Thursday—9:30-10:50 am

Location: VKC 100

Instructor: Assad Oberai
Office: RRB 212
Office Hours: Wednesday 9-11 AM or by appointment
Contact Info: aoberai@usc.edu, Phone: 213-740-1882
Course Description
This course provides an understanding of the mechanics of deformable materials and structures. It introduces the concepts of stress and strain, and basic structural elements like rods, beams, and shearing and bending elements.

Learning Objectives
The learning objectives associated with this course are:
1. Understanding of stress and strain in a solid.
2. Analyzing the deflection of a rod under axial stress.
3. Analyzing the torsion of beams.
4. Analyzing the bending of beams.
5. Ability to transform stresses and strains.
6. Understanding of energy methods to analyze structures.

Prerequisite(s): AME 201 or CE 205
Co-Requisite(s): none.
Concurrent Enrollment: none.
Recommended Preparation: none.

Course Notes
The course will include lectures presented in the classroom. These lectures and other information pertaining to the course will be posted on Blackboard.

Required Readings and Supplementary Materials

Required text:
McGraw-Hill Publication

Supplementary reading material:
University Press, 2012

Description and Assessment of Assignments
Learning outcomes will be assessed by testing students on their performance in:

1. Homework that will be assigned every week or every other week.
2. Mid-term exam.
3. Final exam.
Grading Breakdown

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Points</th>
<th>% of Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 Homeworks</td>
<td>250</td>
<td>20</td>
</tr>
<tr>
<td>Mid-term exams (2)</td>
<td>100</td>
<td>50</td>
</tr>
<tr>
<td>Final exam</td>
<td>100</td>
<td>30</td>
</tr>
<tr>
<td>TOTAL</td>
<td>450</td>
<td>100</td>
</tr>
</tbody>
</table>

Grading Scale
Course final grades will be approximately determined using the following scale
A   90-100
A-  80-89
B+  70-79
B   60-69
B-  55-59
C+  50-54
C   45-49

Assignment Submission Policy
Homework assignments are to be submitted in class on the due date.

Grading Timeline
All graded assignments will be returned to the students within one week.

Additional Policies
Homework assignments that are less than a week late will receive half credit. Any assignments that are late by more than a week will receive no credit.
Course Schedule: A Weekly Breakdown

(Please refer to the Contact Hours Reference at [arr.usc.edu/services/curriculum/resources.html](http://arr.usc.edu/services/curriculum/resources.html).)

<table>
<thead>
<tr>
<th>Week</th>
<th>Topics/Daily Activities</th>
<th>Readings and Homework</th>
<th>Deliverable/ Due Dates</th>
</tr>
</thead>
<tbody>
<tr>
<td>Week 1</td>
<td>Introduction</td>
<td>Chapter 1</td>
<td>HW due in one week</td>
</tr>
<tr>
<td>Week 2</td>
<td>Stress and Strain</td>
<td>Chapter 2</td>
<td>HW due in one week</td>
</tr>
<tr>
<td>Week 3</td>
<td>Axial loading (rod)</td>
<td>Chapter 2</td>
<td>HW due in one week</td>
</tr>
<tr>
<td>Week 4</td>
<td>Torsion</td>
<td>Chapter 3</td>
<td>HW due in one week</td>
</tr>
<tr>
<td>Week 5</td>
<td>Torsion (cont.). Midterm.</td>
<td>Chapter 3</td>
<td>HW due in one week</td>
</tr>
<tr>
<td>Week 6</td>
<td>Bending</td>
<td>Chapter 4</td>
<td></td>
</tr>
<tr>
<td>Week 7</td>
<td>Bending (cont.)</td>
<td>Chapter 4</td>
<td></td>
</tr>
<tr>
<td>Week 8</td>
<td>Analysis and design of beams for bending</td>
<td>Chapter 5</td>
<td>HW due in one week</td>
</tr>
<tr>
<td>Week 9</td>
<td>Shear stresses in beams</td>
<td>Chapter 6</td>
<td></td>
</tr>
<tr>
<td>Week 10</td>
<td>Transformation of Stress and Strain. Midterm.</td>
<td>Chapter 7</td>
<td>HW due in one week</td>
</tr>
<tr>
<td>Week 11</td>
<td>Transformation of Stress and Strain</td>
<td>Chapter 7</td>
<td>HW due in one week</td>
</tr>
<tr>
<td>Week 12</td>
<td>Deflection of Beams</td>
<td>Chapter 9</td>
<td>HW due in one week</td>
</tr>
<tr>
<td>Week 13</td>
<td>Columns</td>
<td>Chapter 10</td>
<td>HW due in one week</td>
</tr>
<tr>
<td>Week 14</td>
<td>Energy Methods</td>
<td>Chapter 11</td>
<td></td>
</tr>
<tr>
<td>Week 15</td>
<td>Review</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>FINAL</strong></td>
<td></td>
<td></td>
<td>Date: For the date and time of the final for this class, consult the USC Schedule of Classes at <a href="http://www.usc.edu/soc">www.usc.edu/soc</a>.</td>
</tr>
</tbody>
</table>

Statement on Academic Conduct and Support Systems
Academic Conduct:
Plagiarism – presenting someone else’s ideas as your own, either verbatim or recast in your own words – is a serious academic offense with serious consequences. Please familiarize yourself with the discussion of plagiarism in SCampus in Part B, Section 11, “Behavior Violating University Standards” https://policy.usc.edu/scampus-part-b/. Other forms of academic dishonesty are equally unacceptable. See additional information in SCampus and university policies on scientific misconduct, http://policy.usc.edu/scientific-misconduct.

Support Systems:
Student Counseling Services (SCS) - (213) 740-7711 – 24/7 on call
Free and confidential mental health treatment for students, including short-term psychotherapy, group counseling, stress fitness workshops, and crisis intervention. https://engemannshc.usc.edu/counseling/

National Suicide Prevention Lifeline - 1-800-273-8255
Provides free and confidential emotional support to people in suicidal crisis or emotional distress 24 hours a day, 7 days a week. http://www.suicidepreventionlifeline.org

Relationship and Sexual Violence Prevention Services (RSVP) - (213) 740-4900 - 24/7 on call
Free and confidential therapy services, workshops, and training for situations related to gender-based harm. https://engemannshc.usc.edu/rsvp/

Sexual Assault Resource Center
For more information about how to get help or help a survivor, rights, reporting options, and additional resources, visit the website: http://sarc.usc.edu/

Office of Equity and Diversity (OED)/Title IX Compliance – (213) 740-5086
Works with faculty, staff, visitors, applicants, and students around issues of protected class. https://equity.usc.edu/

Bias Assessment Response and Support
Incidents of bias, hate crimes and microaggressions need to be reported allowing for appropriate investigation and response. https://studentaffairs.usc.edu/bias-assessment-response-support/

The Office of Disability Services and Programs
Provides certification for students with disabilities and helps arrange relevant accommodations. http://dsp.usc.edu

Student Support and Advocacy – (213) 821-4710
Assists students and families in resolving complex issues adversely affecting their success as a student EX: personal, financial, and academic. https://studentaffairs.usc.edu/ssa/

Diversity at USC
Information on events, programs and training, the Diversity Task Force (including representatives for each school), chronology, participation, and various resources for students. https://diversity.usc.edu/

USC Emergency Information
Provides safety and other updates, including ways in which instruction will be continued if an officially declared emergency makes travel to campus infeasible. http://emergency.usc.edu

USC Department of Public Safety – 213-740-4321 (UPC) and 323-442-1000 (HSC) for 24-hour emergency assistance or to report a crime.
Provides overall safety to USC community. http://dps.usc.edu