

**BOSTON UNIVERSITY**  
**Department of Mechanical Engineering**  
**ME 305: Mechanics of Materials   Sections A1**  
**Fall 2022**

**Instructor and Class Information**

**Instructor:**

- Dr. Xin Zhang: Professor of Mechanical Engineering
- Office: The Photonics Center, Rm. 921
- Email: [xinz@bu.edu](mailto:xinz@bu.edu)
- Phone: (617) 358-2702

**Hours:**

- Class Hours (A1): Monday/Wednesday 12:20-2:05PM (Room: PHO 211)
- Discussions (B1/B2): Monday/Wednesday 11:15AM-12:05PM
- Weekly Hours: Friday 12:00-1:00PM, Zoom link posted on Blackboard  
Friday 3:00-4:00PM, Zoom link posted on Blackboard

**Course Websites:**

- Blackboard: <http://learn.bu.edu>

**Exams:**

- Midterm #1: October 17 (Monday), 12:20-2:05PM, PHO 211
- Midterm #2: November 16 (Wednesday), 12:20-2:05PM, PHO 211
- Final Exam: TBA

**Textbook:**

- Goodno/Gere, Mechanics of Materials, 9<sup>th</sup> ed. (Cengage L), ISBN 9781337093347

**Topics Covered:**

- Chapter 1: Tension, Compression, and Shear
- Chapter 2: Axially Loaded Members
- Chapter 3: Torsion
- Chapter 4: Shear Forces and Bending Moments
- Chapter 5: Stresses in Beams
- Chapter 9: Deflections of Beams
- Chapter 11: Columns
- Chapter 7: Analysis of Stress and Strain
- Chapter 8: Applications of Plane Stress

**Coverage of Major Exams:**

- Midterm#1: Chapter 1,2,3,4
- Midterm#2: Chapter 5,9,11
- Final Exam: Chapter 1,2,3,4,5,9,11,7,8

**Course Summary:**

- This course will introduce students to the theory and application of the fundamentals of mechanics of materials. The course will help enhance students problem-solving skills. After completing the course, students will be prepared for advanced courses in structural engineering. Specific learning objectives of this course are: (1) Gain a general understanding of normal and shear stresses and the relationship between stress and strain. (2) Be able to analyze axially loaded members (statically determinant and indeterminate) and determine the resulting stresses and displacements. (3) Be able to analyze members with circular cross-sections loaded in torsion. (4) Determine bending and shear stress distribution of members loaded in pure bending and transverse loads. (5) Be able to determine slopes and deflections of beams. (6) Understand the concept of stress transformation and be able to determine principle stresses and maximum in-plane shear stresses from a given state of stress. (7) Gain a general understanding of buckling and stability of columns with varying support conditions.

**Grading:**

- The allocation of credit for the semester is as follows:
  - Class attendance & participation 5%
  - Quizzes (drop lowest 2) 10%
  - Labs 20%
  - Midterm 1 (on Chapter 1,2,3,4) 20%
  - Midterm 2 (on Chapter 5,9,11) 20%
  - Final Exam (on Chapter 1,2,3,4,5,9,11,7,8) 25%

**Teaching Assistants (TAs):**

Name	Email	Lecture	Discussion	Lab	Others
Xia Zhu	<a href="mailto:xiaz@bu.edu">xiaz@bu.edu</a>	A1/Zhang	B1/B2	√	
Ao Chen	<a href="mailto:aochen@bu.edu">aochen@bu.edu</a>		Backup	Lead	Lead

*In addition to discussion, additional office hours to be posted on Blackboard.*

**Grader:**

Name	Email	Weekly Quizzes
Xiaohang Xie	<a href="mailto:xhxie@bu.edu">xhxie@bu.edu</a>	√

## Class Policies and Course Components

### Websites:

- The course website is on Blackboard: learn.bu.edu. Most materials (course syllabus, homework solutions, and lab documents) will be distributed via the Blackboard throughout the semester.

### Class Attendance & Participation:

- We expect that if you are registered for ME305A1, you should attend class – in person if possible but online if not. Most of the course material can be found in a textbook, but not everything, and you will be tested on what is covered in class, not what is simply covered in the textbook.

### Homework:

- Homework will be assigned. It will *not* be collected or graded. Solutions will be posted online.
- One of the best methods to learn the material is to read the text, pay attention in class, and work through the assigned problem sets. By working through the problem sets, you will prepare yourself for the weekly quizzes, which in turn will prepare you for the midterm and final exams.

### Quizzes:

- *All of quizzes (except one) will be administered in discussion sections (B1/B2)<sup>1</sup>, started at 11:40AM, 20 mins including submission (11:40AM-12:00PM).* You will need to register to one of discussion sections (B1/B2). Quizzes will start at 11:40PM, no extra time will be given if you are late. TA will wrap up and walk out of the classroom for discussion sections at 12:00PM and any late submission will receive partial or no credits (within 5 mins, at/before 12:05PM, 50%; beyond 5 mins, after 12:05PM, 0%).
- ***Quizzes are closed note and closed book.*** Equation sheet will be provided for each quiz. The purpose of the quizzes is to help you to keep current with the material. The quizzes will consist of problems very similar to homework problems as well as problems discussed in class. Each quiz will be graded on a 10-point scale. ***Generally speaking, no make-up quizzes will be given; however, you will be able to drop your two lowest quiz scores, in recognition of extenuating circumstances that may prevent you from taking the quizzes.***

### Laboratory Materials and Excises:

- The course includes three lab exercises. ***Failure to turn in any one of the laboratory exercises will result in automatic failure of the course.***

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<sup>1</sup> One quiz will be held in class. See schedules in a separated document for more details (date/time/topic/etc.)

### **Midterm and Final Exams:**

- There will be two in-class exams (1 hour and 45 minutes each) given during the semester; see the schedule for dates. The final exam will be given during the final exam period, and the date is TBA.
- *All exams are closed note and closed book.*
- Since the Registrar will set the date later during the semester, *do not make travel plans before the end of the exam period.* Make-up exams will be given only in extreme circumstances. It is your responsibility to let your instructor know as far in advance as possible of an unavoidable conflict or medical emergency.

**Schedule:** Midterm#1 (10/17, PHO211); Midterm#2 (11/16, PHO211); Final Exam (TBA)

**Coverage:** Midterm#1 (Ch. 1,2,3,4); Midterm#2 (Ch. 5,9,11); Final Exam (Ch. 1,2,3,4,5,9,11,7,8)

### **Discussion:**

- You will need to register to one of discussion sections (B1/B2). Led by TA, the discussion sections will focus on solving problems assigned for homework and other, similar problems.
- *All of quizzes (except one) will be held in discussion sections, 11:40AM-12:00PM (20 mins including submission).* Quizzes will start at 11:40PM, no extra time will be given if you are late. TA will wrap up and walk out of the classroom for discussion sections at 12:00PM and any late submission will receive partial or no credits (within 5 mins, at/before 12:05PM, 50%; beyond 5 mins, after 12:05PM, 0%).

### **Grading:**

- All complaints related to grading quizzes, labs, and exams must be reported to 1) Grader-Xiaohang Xie ([xhxie@bu.edu](mailto:xhxie@bu.edu)), 2) TA-Ao Chen ([aochen@bu.edu](mailto:aochen@bu.edu)), copying 3) TA-Xia Zhu, [xiaz@bu.edu](mailto:xiaz@bu.edu), *within one week* after the grades are announced.
- Note that while graded assignments will be posted for your review, we do NOT use the Blackboard Grade Center to calculate semester grades. Ignore any interpretation of your grade based on whatever Blackboard-reported “points” that are displayed.

### **Deadlines and Late Work:**

- Generally speaking, any take-home work (e.g., labs) submitted late will receive partial or no credits (within 24 hours, 75%; within 48 hours, 50%; within 72 hours, 25%; beyond 72 hours, 0%).
- Deadlines help keep the class working together. Mutual respect for your group mates requires that you keep up with the course. Circumstantial uncertainty, however, suggests that we won't all keep up all the time with everything. Therefore, limited flexibility will be available for assignment deadlines on a case-by-case basis, but there will be no flexibility on requirements of those assignments.

### **Drop and Withdrawal Dates:**

- The last day to DROP (with no 'W' on your record): day, October 11, 2022
- The last day to WITHDRAW (with a 'W' on your record): day, November 14, 2022

### **Incompletes:**

- Incompletes will be permitted only for extenuating circumstances and must be arranged with me as soon as such a circumstance arises. This situation only pertains to assignments whose due dates have not yet passed.

### **Accommodations:**

- ***Accommodations for students with documented disabilities:*** If you are a student with a disability or believe you might have a disability that requires accommodations, please contact the Office for Disability Services (ODS) at (617) 353-3658 to coordinate any reasonable accommodation requests. ODS is located at 19 Deerfield St, on the second floor. We will make every effort to accommodate such requests but (a) please notify your instructor at the beginning of the semester if you've received approved accommodations in previous semesters (even if you haven't received your paperwork for this semester yet!) and (b) provide at least one week's notification prior to each exam so we can make the necessary arrangements.
- ***Religious accommodations:*** We are aware of and in agreement with Boston University's Policy on Religious Observance, whereby absences for any religious beliefs are understood and missed assignments on such occasions will be given a chance to be made up. We require notification at least a week in advance, particularly if an accommodation must be made, for such occasions.

### **Ethical Responsibilities:**

- Cheating on homework, exams, lab reports, or any form of assignment, may be a form of plagiarism and is an infringement of every code of engineering ethics. Plagiarism is a serious academic offense and should not be taken lightly. Understanding your ethical responsibilities is an integral part of becoming a professional. A copy of the Code of Ethics of engineers, promulgated by the Accreditation Board for Engineering and Technology (ABET) and the National Society of Professional Engineers can be found on the main course web site. Please recall that when you enrolled at Boston University, you agreed to an Academic Honesty Pledge. The Academic Conduct Code details your responsibilities as well as the results of code violations, and is posted at:  
<https://www.bu.edu/academics/policies/academic-conduct-code/>



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I have read the entire syllabus and understand that I am responsible for following the policies and deadlines outlined in the syllabus.

Name: \_\_\_\_\_

BUID: \_\_\_\_\_

Signature: \_\_\_\_\_

*Please submit this page with your name and signature in discussion section, September 12 or 14, 2022.*