ME 305: Mechanics of Materials

Spring 2015

Instructor and Class Information

Instructor: Dr. Harold Park, Associate Professor of Mechanical Engineering
Office: 730 Commonwealth, ENA 212 (this building is directly above CVS).
Email: parkhs@bu.edu
Phone: (617) 353-4208
Office Hours: W 11-12, other times available via appointment (email preferred)
Class Hours: TTh 2-4 PM
Classroom: PSY B53
Prerequisites: EK301
Course Website: Blackboard (`http://learn.bu.edu`)
Midterms: Tentatively weeks of February 23 and April 6
Final Exam: Tentatively Wednesday, May 6 from 3-5 PM (room TBD)

TA Information

Zenan Qi (zenanqi@bu.edu), Xin Jiang (ssjiang@bu.edu)

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 indeterminant) 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.

Textbook

Mechanics of Materials by R.C. Hibbeler, 9th edition, Pearson 2014

Mastering Engineering Information

`http://www.masteringengineering.com`
Course ID: MEPARK51816

Class Policies

- Homeworks will be assigned each week through the Mastering Engineering website.
- All discussion sections are open to any student enrolled in the course. The discussion sections will focus on solving problems assigned for homework and other, similar problems.
- If you must miss class, see a classmate to obtain the class notes. If, after reviewing the material you have missed, you have questions, see the instructor during office hours and/or teaching fell during discussion sections to get your questions answered.
- All complaints related to grading labs, projects and exams must be reported to the instructor within one week after the grades are announced.
- There will be three laboratories in the course. Laboratory scheduling will be accomplished by a sign-up sheet outside the main laboratory for the course: Room B01, 110 Cummington Mall (ENG).
- The date, time, and location of the final exam will be announced as soon as they have been determined.
- The course project will be assigned before spring break and will be due before the final exam.

Academic Conduct

- Students must follow the COE Academic Conduct Code, which is found in the COE Undergraduate Student Handbook (`http://www.bu.edu/academics/eng/policies/academic-conduct/`). Any violation of this conduct code will be reported to the COE Academic Conduct Committee.
- Plagiarism is discussed briefly in the conduct code. However, for several reasons, this subject warrants additional emphasis. In engineering, just as in humanities, science, and social science disciplines, plagiarism is unacceptable. Plagiarism is theft of another person's ideas and is a punishable offense in the same way that any form of theft is an offense. Plagiarism harms the individual whose ideas have been stolen. Original thought is highly valued in engineering and is expected from students in this course in preparing and completing all course assignments.
- Quizzes, Midterm and Final Exams: These assignments are to be completed by each student individually with no consultation with any other person other than the proctor.
- Homework, Lab Reports, and Course Project: Students are permitted to consult with each other regarding approaches to solving problems in these assignments. However, everything that is written down and turned in must be authored by the student getting credit for the assignment, and any sources that were consulted while completing the assignment must be referenced. For example, if you consult with another person in preparing one section of a laboratory report, you should write "Consulted with ⟨person's name⟩ in preparing this section" in that section of the report. Similarly, if you consult with a textbook other than the course text or a webpage, acknowledge this in writing in the relevant section of the report or project.

Approximate List of Topics to be Covered

Stress, strain, mechanical properties of materials, axial loading, torsion, bending, transverse shear, stress transformation, deflection of beams and shafts, buckling

Grading

- Homeworks: 10%
- Labs: 15%
- Midterm 1: 20%
- Midterm 2: 20%
- Course project: 15%
- Final exam 20%: