Boston University ENG ME 302: Engineering Mechanics II

Syllabus for Spring 2021, Section A1

Instructor:
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GST:
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Class Time and Location:

All times are listed in EST (GMT –5). Lectures will be held in the GSU Auditorium with a simultaneous Zoom session. Discussions, Office Hours, and all other meetings will be held over Zoom.

Lectures:	Tuesdays & Thursdays	1:30pm – 3:15pm
Discussions:	Fridays	3:35pm – 4:25pm
Office Hours:	Mondays	9:00am – 10:00am
	Wednesdays	6:00pm – 7:00pm

In-person attendance will be managed with the InClass LfA app (www.bu.edu/inclasslfa). Please check Blackboard for all Zoom links and schedule updates.

Prerequisites

All students should have taken EK 301: Engineering Mechanics I.

Textbook

Williams JH, *Fundamentals of Applied Dynamics (The MIT Press),* John Wiley and Sons, Inc 1996. ISBN: 9780262039710

Description

Welcome to ME 302! This syllabus contains important information about course resources, expectations, and goals. Please read this document carefully and familiarize yourself with its contents.

Within Engineering Mechanics II, we will cover topics including: kinematics of particles and rigid bodies, Newtonian dynamics, and Lagrangian dynamics. We will study inertial and non-inertial reference frames, coordinate systems and transforms, linear and angular momenta, moments of inertia, Hamilton's principle, Lagrange's equations, and small oscillations.

Learn from Anywhere (LfA) and Remote Attendance

Due to the covid-19 social distancing limitations, there is a limited number of students who may be in the classroom at any given time. If you plan to attend the class in person, you must reserve a spot via the InClass LfA app.

If you are off-campus or otherwise unable to come to class in person, you should attend the class remotely via Zoom. All lecture sections will hold a concurrent live Zoom session. The chat will be monitored continuously, and we will use Breakout rooms for in-class small group problems. If you are unable to attend the live Zoom session due to time zone issues, it is your responsibility to watch the recorded Zoom session in a timely fashion.

To foster a community of learning, we expect all remote students will have their cameras on during the lecture, and enable your microphone for discussions. This will also help us check that we are not moving too fast or too slow! For in-class quizzes and exams, we may also require remote students to keep their cameras on.

Office Hours

We will hold drop-in office hours at various points in the week. This is a great time to come ask questions about the course, clarify any concepts, or discuss any concerns. These sessions will be “open-Zoom” – if you have a matter you would rather discuss in a one-on-one setting, please email the instructor ahead of time to schedule.

Discussion Section

In addition to the biweekly lectures, the Graduate Student Teacher will host an “open-Zoom” discussion section. Attendance to the discussion is purely voluntary, and will consist of additional problem solving (such as reviewing quiz solutions), as well as basic homework assistance.

Website and Digital Materials

The course website is on Blackboard (learn.bu.edu), please check often for updates. Here, we will post the course syllabus, homework solutions, and documents for the lab. Please note that all asynchronous content will be the same (e.g., homework and projects), but the quizzes and exams will be unique based on the assigned time slot for the exam.

Zoom: All aspects of the course will use Zoom, including: lectures, discussion, office hours. Zoom links for these components will be posted on Blackboard. Additionally, all lecture Zoom sessions will be recorded and posted on Blackboard.

Pronto: We will use the Pronto messaging app to communicate within the course, which is both available in Blackboard and as a stand-alone app. We encourage everyone with general questions that other folks might find useful to post to Pronto, and for everyone to respond. Questions involving sensitive information (e.g., grade or health issues) should be addressed in an email to the instructor.

Class Updates: For course-wide updates, these will be posted as Blackboard announcements and sent via email. Please remember to check these communication channels and respond when needed.

Assignments and Grading Criteria

Individual progress and evaluation for the course material will consist of weekly problem sets, regular in-class quizzes, two in-class exams, a lab project, and a final exam. The breakdown for grade weighting is:

Homework	5%	Midterm Exam 1	25%
Quizzes	10%	Midterm Exam 2	25%
Lab Project	10%	Final Exam	25%

Submissions

All work will be submitted online through Blackboard/Gradescope. When writing up your solutions, please keep in mind the following:

- Your name and assignment number at the top of every page
- If the solution to a problem is multiple pages, please number your pages
- Start each problem on a new page
- Indicate your final solution by drawing a solid box around it

Homework

We will have weekly homework assignments that expand upon the material in lecture and are great practice for the in-class quizzes. These assignments will not be graded, but instead assessed on a “Completed/Not Completed” basis for a maximum of two (2) points per assignment. It is important to show your work for full credit.

Problem sets will generally be due to Gradescope by noon on Fridays, and solutions will be posted in the afternoon. Please note that late problem sets will not be permitted.

The goal of homework is to practice these concepts and learn how to solve dynamics problems. If you have questions, please seek out help in Office Hours, Discussions, or with your fellow classmates! When working in groups, please keep in mind the Ethics Code and do not copy others’ answers.

Quizzes

Short (~15min) quizzes based on the homework will be given during lectures the week following the homework due date (typically on Thursdays). Each quiz will be graded on a three (3) point scale: one point for attempting the quiz; two points if you were on the right track; and three points for a correct solution while showing your work. Please study the posted solutions to the problem sets to prepare for the following quizzes. Arrangements to take the quiz at an alternative time must be approved at least one week in advance with the instructor, and will only be granted in extraordinary circumstances. We will not offer make-up quizzes, but we drop the two lowest quiz grades.

Lab Project
There will be a short lab project later in the semester that applies the skills learned in the class. As mechanical engineers, our goal is to not only study the concepts of dynamics, but to also apply this knowledge to solve real problems. The project will require a small experiment, and you will prepare a short lab report. Further details on the lab, including any supplies needed, will be available later in the semester.

Exams
There will be two midterm exams given during the semester, and a comprehensive final exam during Finals Week. All exams will be administered online and occur during the lecture time. Make-up exams will be given only in extreme circumstances. Please let the instructor know as soon as possible of an unavoidable conflict or medical emergency.

If you qualify for extended time on exams, per evaluation form the Office of Disability Services, it is your responsibility to present your documentation to the instructor at least a week before the first exam. Please inform the instructor at the beginning of the semester if you expect to receive extended time, even if you haven't received your documentation yet. We cannot accommodate last-minute requests for extended time.

Resources and Support

Accommodations for Students with Documented Disabilities
If you are a student with a disability or believe you might have a disability that requires accommodations, requests for accommodations must be made in a timely fashion to the Disability & Access Services, 25 Buick St, Suite 300, Boston, MA 02215; 617-353-3658 (Voice/TTY). Students seeking academic accommodations must submit appropriate medical documentation and comply with the established policies and procedures.

We will make every effort to accommodate such requests, so (a) please notify us at the beginning of the semester if you've received approved accommodations in previous semesters (even if you haven't received documentation for this semester yet) and (b) our policy is that we need at least one week's notification prior to each exam so we can make the necessary arrangements.

Student Wellbeing
Students may experience stressors that can impact both their academic experience and personal wellbeing. These may include academic pressure and challenges associated with relationships, mental health, alcohol or other drives, identities, finances, etc. If you are experiencing concerns, seeking help is a courageous thing to do for yourself and those who care about you. If the source of your stressors is academic, please contact the instructor so we can find solutions together. For personal concerns, Boston University offers many resources, including free and confidential mental health counseling through Student Health Services Behavioral Medicine.

Class and University Policies

Class Policy

In general, we expect that if you are registered for ME302, you should attend class. While most of the course material can be found in a textbook, successful students often report that attending class is one of the best ways to learn the material. The course faculty treat you as responsible adults with the ability to manage your priorities and therefore do not take attendance as a general rule.

We are also 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. Students are strongly encouraged to notify the instructor in advance, particularly if an accommodation must be made, for such occasions.

Assignment Completion & Late Work

Homework: Since the solutions are posted following the submission deadline, late problem sets are not permitted and will receive a zero. Working in groups is permitted, but solution write-ups should be the work of the individual student and not copied.

Quizzes: Unless arranged in advance due to extraordinary circumstances, quizzes must be taken during the lecture time. Make-up quizzes will not be granted, but in light of unforeseen events that could cause you to miss a quiz, we drop the lowest two scores. Students may not work in groups or consult outside resources during quizzes.

Exams: Make-up exams will be given only in extreme circumstances. It is your responsibility to contact your instructor as soon as possible in the event of an unavoidable conflict or medical emergency. Students may not work in groups or consult outside resources during exams.

Academic Conduct Statement

Cheating on homework, quizzes, exams, lab project 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 an engineer.

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/

Class Schedule

The tentative schedule is listed below. Please check Blackboard for any recent updates or changes to the dates below.

Week	Dates	Reading	Topic	HW Due	Quiz/Exam
1	Jan. 26 Jan. 28	Ch 1-2	Review of Particle Kinematics		
2	Feb. 2 Feb. 4	Ch 3	Rigid Body Kinematics	HW 1	
3	Feb. 9 Feb. 11	Ch 3	Rigid Body Kinematics	HW 2	Quiz 1
4	- Feb. 18	Ch 4	Rigid Body Kinematics	HW 3	Quiz 2
5	Feb. 23 Feb. 25	Ch 4	Particle Dynamics	HW 4	Quiz 3
6	Mar. 2 Mar. 4	Ch 6	Moment of Inertia	-	Midterm 1
7	Mar. 9 Mar. 11	Ch 6	Moment of Inertia	HW 5	Quiz 4
8	Mar. 16 -	Ch 5	Rigid Body Dynamics	HW 6	
9	Mar. 23 Mar. 25	Ch 5	Generalized Coordinates	HW 7	Quiz 5
10	Mar. 30 Apr. 1	Ch 5	Work and State Functions	HW 8	Quiz 6
11	Apr. 6 Apr. 8	Ch 5	Hamilton's Principle	-	Midterm 2
12	Apr. 13 Apr. 15	Ch 6	Lagrangian Dynamics	HW 9	Quiz 7
13	Apr. 20 Apr. 22	Ch 6	Lagrangian for Rigid Bodies	HW 10	Quiz 8
14	Apr. 27 Apr. 29	Ch 8	Small Oscillations	HW 11	Quiz 9
15	May 4 – May 8		Finals week, schedule TBD		Final Exam