Boston University ENG ME 302: Engineering Mechanics II

Syllabus for Spring 2022, Section A1

Instructor:
Prof. Alyssa Pierson
Email: pierson@bu.edu

GST:
Mela Coffey
Email: mcoffey@bu.edu

Class Times and Locations:

All times are listed in EST (GMT −5). Lectures, discussions, office hours, and all other meetings will be held in-person unless otherwise posted.

Lectures:	Tuesdays & Thursdays	KCB 106	1:30pm – 3:15pm
Discussions:	Tuesdays (B3)	HAR 212	3:35pm – 4:25pm
	Fridays (B1)	EPC 209	3:35pm – 4:25pm
Lab Experiment:	Week of March 14	ENG 113A	Lab Block B
Office Hours:	By appointment	730 Comm, RM 217	

Students are encouraged to attend discussion sections for any questions pertaining to homework and course material. Prof. Pierson will host office hours for one-on-one meetings by appointment. Please check Blackboard regularly for any updates to these times and locations.

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.

Course Website

The course website is on **Blackboard** (learn.bu.edu), please check often for updates. Here, we will post the course syllabus, assignments, homework and quiz solutions, and documents for the lab. Course-wide updates will be posted as Blackboard announcement. 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, one midterm exam, lab projects, and a final exam. The breakdown for grade weighting is:

Participation	5%	Quizzes	15%
Homework	10%	Midterm Exam	25%
Lab Projects	15%	Final Exam	30%

Submissions

All work will be **submitted online through 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 Mondays, and solutions will be posted in the afternoon. Please note that late problem sets will not be accepted. 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 lowest quiz grade.

Lab Projects
There will be an experimental lab project **during the week of March 14th** 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. In addition, there will be short Matlab simulation labs throughout the semester.

Exams
There will be one midterm exam given during the semester, and a comprehensive final exam during Finals Week. Make-up exams will be given only in extreme circumstances. Please let Prof. Pierson know 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
We expect that if you are registered for ME302, you should attend class. While most of the material is in a textbook, successful students often report that attending class is one of the best ways to learn. 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 & Labs: 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 score. 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.

Covid-19 Contingency Policy
All activities related to ME302 are expected to occur in-person, unless otherwise specified by changes in Boston University policy and local public health guidelines. **Students in quarantine due to covid-19 will have access to a Zoom recording of the lecture.** In the event of an extended absence, please contact Prof. Pierson ASAP to determine a plan.

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/

Tentative Class Schedule (check Blackboard for updates)

Week	Dates	Reading	Topic	HW Due	Quiz/Exam
1	- Jan. 20	Ch 1-2	Review of Particle Kinematics		
2	Jan. 25 Jan. 27	Ch 3	Rigid Body Kinematics	HW 1	Quiz 1
3	Feb. 1 Feb. 3	Ch 3	Rigid Body Kinematics	HW 2	Quiz 2
4	Feb. 8 Feb. 10	Ch 4	Rigid Body Kinematics	HW 3	Quiz 3
5	Feb. 15 Feb. 17	Ch 4	Particle Dynamics	HW 4	Quiz 4
6	- Feb. 24	Ch 5	Generalized Coordinates	HW 5	Quiz 5
7	Mar. 1 Mar. 3	Ch 5	Work and State Functions	HW 6	Quiz 6
8	Spring Recess				
9	Mar. 15 Mar. 17	Ch 5	Hamilton's Principle	In-Person Lab	
10	Mar. 22 Mar. 24	Ch 5	Lagrangian Dynamics	HW 7	Midterm
11	Mar. 29 Mar. 31	Ch 5	Moments of Inertia	HW 8	Quiz 7
12	Apr. 5 Apr. 7	Ch 6	Rigid Body Dynamics	HW 9	Quiz 8
13	Apr. 12 Apr. 14	Ch 6	Lagrangian for Rigid Bodies	HW 10	Quiz 9
14	Apr. 19 Apr. 21	Ch 6	Lagrangian for Rigid Bodies	HW 11	Quiz 10
15	Apr. 26 Apr. 28	Ch 8	Mechanical Vibrations	HW 12	Quiz 11
16	May 3 -	Ch 8	Special Topics		
17	Final Exam: TBD				