Department of Mechanical Engineering
University of California – Berkeley
ME104 Engineering Mechanics II
Spring 2022
Revised Feb. 14, 2022

Course Instructor	Noel Perkins, nperkins@berkeley.edu Office hours and office: MW 12-1:30 (via Zoom to start the term)
Graduate Student Instructors	Theresa Honein, theresa_honein@berkeley.edu Office hours and office: T 3:30-5; Th 12:30-2 Arthur Guivarch, arthur_guivarch@berkeley.edu Office hours and office: Th 4-5:30
Contacting Instructors	We welcome all questions and we suggest that you message us by email. You may message your section instructor or the course instructor per your discretion.
Class Meetings	Lectures: MWF 11am-12 pm, North Gate 105 (via Zoom to start the term) Discussion Section 101: T 1-2, Hearst Mining 310 (via Zoom to start the term) Discussion Section 102: T 2-3, Etcheverry 3110 (via Zoom to start the term) Discussion Section 103: F 10-11, Etcheverry 3113 (via Zoom to start the term)
Course Website	on bcourses/canvas: http://bcourses.berkeley.edu
Prerequisite	MEC 85 Introduction to Solid Mechanics
Recommended Textbook	*Engineering Mechanics: Dynamics*, Meriam and Kraige Any edition of the book is suitable and recommended, but not essential.

Expectations
You should expect that I provide the clearest possible lectures, and that I address your learning needs using a variety of methods. I endeavor to make lectures engaging and to include many active learning exercises for you to complete. These exercises are critical to your learning. Consequently, I expect that you will not only attend each lecture (both online and in person), but that you will offer ample questions and discussion for the benefit of all. Importantly, all members of our course are expected to contribute to a respectful, welcoming and inclusive learning environment, and I am dedicated to achieving that goal. If I accidentally use language that creates offense or discomfort, please contact me so that I can avoid making the same mistake again.

Course Overview
In this course, you will learn how to model and analyze the motion of particles (in three dimensions) and rigid bodies (in two dimensions). You will also see how models of particles and rigid bodies may represent engineered systems and devices and learn the methods to predict their performance for use in engineering design. The topics include the kinematics and kinetics of particles and rigid bodies (planar) with significant emphasis on vector mechanics for describing kinematical variables and the resulting equations of motion.

Homework Assignments
Completing homework problems are essential parts of this course and they represent critical opportunities to learn the material. These will be due by 5pm PST on the days noted in the attached schedule and they should be submitted via Gradescope which is accessible through the course's Canvas page. All homework will be counted towards your grade and late assignments will not be accepted without advance notice of extenuating circumstances. Assignments and solutions will be posted on our course website.

All homework assignments are to be completed on your own. You are welcome to consult with other students and the instructors during the conceptualization of a homework problem but all written work, whether in scrap or final form, is to be generated by you. You are also not allowed to possess, look at, use, or in any way derive advantage from the existence of solutions, whether these solutions were former students' work product or copies of solutions that had been made available by any instructor, publisher or website.

Examinations

There will be two in-class midterm examinations on **2/28** and **4/18** and one final examination on **5/10** as also listed on the attached course outline. Please mark these dates in your calendar now as no make-up exams will be given except in cases of documented emergency.

Grading

Historically, the average grade in ME104 is 3.1/4.0 (i.e., close to a B). This term your grade will be calculated using the following percentages:

Homework	15%
First Examination	20%
Second Examination	20%
Final Examination	45%

DSP

If you participate in the DSP program, kindly send documentation to Dr. Perkins within the first two weeks of the term (by Jan. 31) so that we can plan for your accommodation.

Course Schedule

Date	Topic	Parallel Textbook Reading*	Homework
1/19	Review Syllabus, Particle Kinematics	2/1, 2/2	
1/21	Particle Kinematics	2/2, 2/3, 2/4	**Hw. 1 Assigned**
1/24	Particle Kinematics	2/4	
1/26	Particle Kinematics	2/5	
1/28	Particle Kinematics	2/6	**Hw. 1 Due, Hw. 2 Assigned**
1/31	Particle Kinematics	2/7	
2/2	Particle Kinetics: Newton's Law	3/1, 3/2, 3/3	
2/4	Particle Kinetics: Newton's Law	3/3, 3/4	**Hw. 2 Due, Hw. 3 Assigned**
2/7	Particle Kinetics: Newton's Law	3/4, 3/5	
2/9	Particle Kinetics: Newton's Law	3/5	
2/11	Particle Kinetics: Newton's Law	3/5	**Hw. 3 Due, Hw. 4 Assigned**
2/14	Particle Kinetics: Newton's Law	3/5	
2/16	Particle Kinetics: Work/Energy	3/6	
2/18	Particle Kinetics: Work/Energy	3/6	**Hw. 4 Due, Hw. 5 Assigned**
2/21	**Holiday**		
2/23	Particle Kinetics: Work/Energy	3/7	
2/25	Particle Kinetics: Review for Exam		**Hw. 5 Due, Hw. 6 Assigned**
2/28	**Midterm Exam 1: Particle Dynamics material thru Newton's Law (Feb. 14)**		
3/2	Particle Kinetics: Work/Energy	3/7	
3/4	Particle Kinetics: Impulse/Momentum	3/8	**Hw. 6 Due, Hw. 7 Assigned**
3/7	Particle Kinetics: Impulse/Momentum	3/9	
3/9	Rigid Body Kinematics	5/1, 5/2, 5/4	
3/11	Rigid Body Kinematics	5/5	**Hw. 7 Due, Hw. 8 Assigned**
3/14	Rigid Body Kinematics	5/6	
3/16	Rigid Body Kinematics	5/7	
3/18	Rigid Body Kinematics	5/7, 5/8	**Hw. 8 Due, Hw. 9 Assigned**
3/21-3/25	**Spring Recess**		
3/28	Rigid Body Kinematics	5/7, 5/8	
3/30	Rigid Body Kinematics	5/7, 5/8	
4/1	Background to Rigid Body Kinetics	4/2, 4/4, 6/2	**Hw. 9 Due, Hw. 10 Assigned**
4/4	Rigid Body Kinetics: Newton/Euler Eqns.	6/3, 6/4, 6/5	
4/6	Rigid Body Kinetics: Newton/Euler Eqns.	6/3, 6/4, 6/5	
4/8	Rigid Body Kinetics: Newton/Euler Eqns.	6/3, 6/4, 6/5	**Hw. 10 Due, Hw. 11 Assigned**
4/11	Rigid Body Kinetics: Newton/Euler Eqns.	6/3, 6/4, 6/5	
4/13	Rigid Body Kinetics: Newton/Euler Eqns.	6/3, 6/4, 6/5	
4/15	Review for Exam		**Hw. 11 Due, Hw. 12 Assigned**
4/18	**Midterm Exam 2: Rigid Body Dynamics material thru April 13**		
4/20	Rigid Body Kinetics: Work/Energy	6/6	
4/22	Rigid Body Kinetics: Work/Energy	6/6	**Hw. 12 Due, Hw. 13 Assigned**
4/25	Rigid Body Kinetics: Work/Energy	6/6	
4/27	Rigid Body Kinetics: Impulse/Momentum	6/7	

4/29	Rigid Body Kinetics: Impulse/Momentum	6/7	**Hw. 13 Due**
5/2-5/6	Review Sessions for Final Exam		
5/10	**Final Examination 7-10 PM**		

(*) These sections to read refer to 7th edition of Meriam and Kriage

https://rtl.berkeley.edu/services-programs/course-capture