

Department of Mechanical Engineering
University of California at Berkeley
ME 104 Engineering Mechanics II
Fall Semester 2019

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Consultation Hours: M 4-5.30 pm, W 2-3.30 pm

Class Location and Website

MWF 10-11 am, Valley Life Sciences 2040; course website at <http://bcourses.berkeley.edu>

Course Prerequisite

MEC 85 Introduction to Solid Mechanics

Textbook

J. L. Meriam, L. G. Kraige and J. N. Bolton, *Engineering Mechanics: Dynamics*, 9th ed., Wiley, Hoboken, New Jersey, 2018.

Supplementary Reference

R. C. Hibbeler, *Engineering Mechanics: Dynamics*, 14th ed., Pearson, Hoboken, New Jersey, 2016.

Course Contents

Newtonian dynamics of particles and rigid bodies in one-dimensional and planar motions. This corresponds to Chapters 1-6 and 8 of textbook, with occasional omissions.

Class Rules

Homework problems will be assigned each week and are due by 11.59 pm on Friday of the following week. Late homework will not be graded. Solutions to homework problems will be posted on the course website. Two Midterm Examinations and a Final Examination are planned. Examinations must be taken as scheduled. Approximate contributions to the final grade are as follows:

Homework	15%
First Midterm on Monday, 10/14/2019, 10-11 am	20%
Second Midterm on Wednesday, 11/13/2019, 10-11 am	20%
Final Examination on Monday, 12/16/2019, 8-11 am	45%

Course Objectives

To give a compact and consistent account of the principles of Newtonian dynamics. Applications will be mentioned whenever feasible.

Week	Topics	Text Sections	Homework Problems	Due Date
1 8/26	Introduction Kinematics of Particles	1/1-1/8 2/1-2/4	Review of Basic Concepts	
2 9/2	Plane Curvilinear Motion Translating Axes	2/5-2/6 2/8	2/80, 2/90, 2/99, 2/102, 2/110, 2/121, 2/151, 2/166	9/13
3 9/9	Constrained Motion Kinetics of Particles	2/9-2/10 3/1-3/5	2/172, 2/179, 2/181, 2/182, 3/3, 3/28, 3/45	9/20
4 9/16	Work and Energy Impulse and Momentum	3/6-3/7 3/8-3/10	3/69, 3/73, 3/84, 3/103, 3/108, 3/134, 3/263	9/27
5 9/23	Impact Systems of Particles	3/11-3/12 4/1-4/2	3/142, 3/169, 3/191, 3/193, 3/198, 3/211, 3/212	10/4
6 9/30	Kinetics of Systems of Particles	4/3-4/5	4/10, 4/12, 4/19, 4/21, 4/23, 4/27, 4/79, 4/80	10/11
7 10/7	Plane Kinematics of Rigid Bodies	5/1-5/4	5/15, 5/31, 5/41, 5/42, 5/61, 5/63, 5/65, 5/69	10/18
First Midterm		Monday 10/14/2019	10-11	
8 10/14	Plane Kinematics of Rigid Bodies	5/5-5/6	5/83, 5/85, 5/87, 5/91, 5/93, 5/122	10/25
9 10/21	Rotating Axes Moments of Inertia	5/7-5/8 Appendix B	5/127, 5/131, 5/137, 5/142, B/29, B/37, B/45	11/1
10 10/28	Plane Kinetics of Rigid Bodies	6/1-6/3	6/4, 6/12, 6/20, 6/29, 6/31, 6/33, 6/36, 6/39	11/8
11 11/4	General Equations of Motion	6/4-6/5	6/45, 6/48, 6/51, 6/59, 6/62, 6/63, 6/64	11/15
Second Midterm		Wednesday 11/13/2019	10-11	
12 11/11	Kinetics of Rigid Bodies Work and Energy	6/5-6/6	6/67, 6/76, 6/79, 6/81, 6/99, 6/114, 6/118	11/22
13 11/18	Work and Energy Impulse and Momentum	6/6 6/8	6/145, 6/146, 6/148, 6/155, 6/158, 6/162, 6/165	12/6
14 11/25	Impulse and Momentum	6/8	Thanksgiving Holidays	
15 12/2	Conservation of Momentum Vibration	6/8-6/9 8/1-8/2	Topics in Vibration Optional	
Final Exam		Monday 12/16/2019	8-11	