University of California at Berkeley
Department of Mechanical Engineering

ME 104: Engineering Mechanics II

Fall Semester 2016

Lectures: MWF 1:10-2:00, 105 Northgate Hall

Discussion Sections: 101, Tu 10:10-11:00, 20 Barrows (Yildizdag)
102, Th, 4:10-5:00, 56 Barrows (Salsa)

Instructor: J. Casey
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GSI's: *Rubens Salsa, rsalsa@berkeley.edu*
Erden Yildizdag, yildizdag@berkeley.edu

Office Hours: Casey, MWF, 2:15-3:30, 6125 Etcheverry Hall
Salsa, TuF, 11:00-12:30, Hesse Hall
Yildizdag, M, 11:30-1:00, Th, 10:30-12:00, 6102 Etcheverry Hall

Approximate Grading Scheme:

Homework	25%
Midterm Exam 1	15%
Midterm Exam 2	15%
Final Exam	45%

Homework: Homework should be handed in at the lecture. There's also a dropbox on the 3rd floor in Etcheverry Hall, next to the South Entrance

Textbook: J.L. Meriam, L.G. Kraige, and J.N. Bolton, *Engineering Mechanics: Dynamics*, 8th Edition, John Wiley & Sons, Inc., 2015

Exam Dates: Midterm 1…….Wednesday, 5 October
Midterm 2…….Wednesday, 9 November
Final……. Wednesday, 14 December, 7:00-10:00 p

Topic	*Sections in Book*
1. INTRODUCTION	
Basic concepts, Newton's and Euler's laws	1/1-1/8, 3/1-3/3
2. KINEMATICS OF A PARTICLE	
A particle moving in space	2/1-2/4
Radial and transverse components	2/6-2/7
Tangential and normal components	2/5
Relative motions	2/8
Constrained motions	2/9
3. DYNAMICS OF A PARTICLE	
Newton's laws	3/1-3/3
Rectilinear motions	3/4
Curvilinear motions	3/5
Work, power, kinetic energy	3/6
Conservative force fields, potential energy	3/7
Linear momentum, linear impulse	3/8-3/9
Angular momentum, angular impulse	3/10
Impact	3/12
Central forces	3/13
Non-inertial frames of reference	3/14

4. DYNAMICS OF A SYSTEM OF PARTICLES

Dynamics of a system of particles, Euler's laws	4/1, 4/2, 4/4
Work and energy relations	4/3
Conservation principles	4/5
Control volume, steady mass flow	4/6
Mass ingestion/expulsion, rocket propulsion	4/7

5. PLANE KINEMATICS OF RIGID BODIES

Rigidity, translations, rotation tensor, angular velocity, velocity field, acceleration field	5/1-5/4
Instantaneous center of zero velocity	5/5
Relative acceleration	5/6
Moving frames of reference, corotational bases and corotational Rates, Coriolis acceleration	5/7

6. PLANE DYNAMICS OF RIGID BODIES

Euler's laws for rigid bodies. The inertia tensor.	6/1-6/3, Appendix B
Rotation about a fixed axis	6/4
General plane motions	6/5
Work and energy relations	6/6
Momentum, impulse	6/8

8. VIBRATIONS

Free vibrations of a spring-mass system. Damping.	8/1-8/2
Forced vibrations, resonance	8/3
Vibrations of rigid bodies	8/4
Vibrations of conservative systems	8/5

Revised: 19 August 2016