

Instructor

[JORGE A. RAMÍREZ](#), PH.D.

PROFESSOR

Hydrologic Science and Engineering
Civil and Environmental Engineering Department
A222 Engineering Bldg. - (970) 491-7621

e-mail: Jorge.Ramirez@ColoState.edu

Office Hours: MWF 1:00 PM – 2:00 PM – A222 Engineering Bldg.

Textbooks and References

1. *Engineering Mechanics - Dynamics* by J. L. Meriam and L. G. Kraige. Sixth Edition, John Wiley and Sons, 2007.
 2. http://www.engr.colostate.edu/~ramirez/ce_old/classes/ce261_Ramirez/CE261-new.htm
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Course Objectives

Download [syllabus](#) in AdobeAcrobat PDF format.

This course introduces engineering students to the analysis of dynamic systems encountered in engineering design practice. As a result, students will develop a clear understanding of the basic principles that govern the dynamics of particles and rigid bodies; as well as an ability to use that understanding in the solution of engineering problems.

Methodology

Students will be given weekly reading assignments and homework problems. Reading assignments and homework problems are fundamental to the student's success in understanding the material. In particular, the homework problems will develop the student's ability to visualize the nature of the physical problem at hand and to develop the corresponding mathematical description leading to a solution. Students are expected to read the assigned material prior to the corresponding lecture.

Homework

Homework assignments will be posted weekly on the web page for the class. Three or more problems will be assigned each week, three of which must be turned in for credit. Only one of the three problems will be graded. **Homework assignments are due by the end of class every Wednesday. No late homework assignments will be accepted.**

Your solutions to homework problems should:

- a) include definition of the problem;
- b) show clearly the solution procedure; and
- c) present and highlight (i.e., in a box) the answers with appropriate units.

You are encouraged to work with others; however, the work you turn in must be your own.

Topics

Kinematics of particles

Rectilinear Motion
Plane curvilinear motion
Space curvilinear motion
Relative motion

Kinetics of particles

Newton's Second Law: Force, Mass and Acceleration
Work and Energy
Impulse and Momentum

Kinematics of rigid bodies

Rotation
Absolute motion
Relative motion

Kinetics of rigid bodies

Force, Mass and Acceleration
Work and Energy
Impulse and Momentum

Course Evaluation

Homework and other assignments	20%
3 Midterm Exams @20% each	60%
Final Exam	20%

Midterm exams will be **evening** exams to be held from 5 – 6:30 pm on the specified dates.

Course Prerequisites

CE 260 Engineering Mechanics - Statics;

Schedule

Lecture MWF 12:00 PM - 12:50 PM – Clark A204

	Date	Topic	Sections	Pages
1	Jan 23	Chapter 1: Introduction to Dynamics	1/1 - 1/7	3 - 20
2	Jan 25	Chapter 2: Kinematics of Particles - Rectilinear Motion	2/1 - 2/2	21 - 39
3	Jan 28	Plane Curvilinear Motion - x, y coordinates	2/3 - 2/4	40 - 54
4	Jan 30	Plane Curvilinear Motion - n, t coordinates	2/5	55 - 67
5	Feb 1	Plane Curvilinear Motion - n, t coordinates	2/6	68 - 80
6	Feb 4	Plane Curvilinear Motion - r, q coordinates	2/7	81 - 90
7	Feb 6	Plane Curvilinear Motion - r, q coordinates	2/7 - 2/8	81 - 90
8	Feb 8	Relative Motion	2/8	91 - 100
9	Feb 11	Constrained Motion	2/9	10 - 117
10	Feb 13	Chapter 3: Kinetics of Particles - Force, Mass and Acceleration	3/1 - 3/2	119 - 124
11	Feb 15	Newton's Second Law - Equation of Motion - Rectilinear Motion	3/3 - 3/4	124 - 139
12	Feb 18	Curvilinear Motion	3/5	140 - 156
	Feb 19	First Mid-term Exam		
13	Feb 20	Curvilinear Motion	3/5	140 - 156
14	Feb 22	Work and Energy - Kinetic Energy	3/6	157 - 176
15	Feb 25	Linear Springs - Work-Energy Equation	3/6	157 - 176
16	Feb 27	Conservative Force Fields	3/7	177 - 193
17	Feb 29	Potential Energy	3/7	177 - 193
18	Mar 3	Potential Energy	3/7	177 - 193
19	Mar 5	Linear Impulse and Linear Momentum	3/8 - 3/9	193 - 208
20	Mar 7	Linear Impulse and Linear Momentum	3/9	193 - 208
21	Mar 10	Angular Impulse - Angular Momentum	3/10	209 - 220
22	Mar 12	Angular Impulse - Angular Momentum	3/10	209 - 220
23	Mar 14	Impact	3/11 - 3/12	221 - 233
	Mar 17	Spring Break – No Classes		
	Mar 19	Spring Break – No Classes		
	Mar 21	Spring Break – No Classes		
24	Mar 24	Impact	3/11 - 3/12	221 - 233
	Mar 25	First Mid-term Exam		
25	Mar 26	Chapter 5: Plane Kinematics of Rigid Bodies - Translation - Rotation	5/1 - 5/2	331 - 343
26	Mar 28	General Motion	5/3	344 - 355
27	Mar 31	Relative Velocity	5/4	356 - 370
28	Apr 2	Relative Velocity	5/4 - 5/5	356 - 380
29	Apr 4	Relative Acceleration	5/6	381 - 394
30	Apr 7	Relative Acceleration	5/6	381 - 394

31	Apr 9	Motion Relative to Rotating Axes	5/7	395 - 410
32	Apr 11	Motion Relative to Rotating Axes	5/7	395 - 410
33	Apr 14	Motion Relative to Rotating Axes - Coriolis Acceleration	5/7	395 - 410
	Apr 15	Third Mid-term Exam		
34	Apr 16	Chapter 6: Plane Kinetics of Rigid Bodies - Introduction	6/1	419 - 425
35	Apr 18	General Equation of Motion	6/2	419 - 425
36	Apr 21	Translation - Fixed-Axis Rotation	6/3 - 6/4	425 - 453
37	Apr 23	General Plane Motion	6/5	454 - 470
38	Apr 25	General Plane Motion	6/5 - 6/6	454 - 470
39	Apr 28	Work-Energy Relations	6/6	471 - 488
40	Apr 30	Work-Energy Relations	6/6	471 - 488
41	May 2	Impulse and Momentum	6/8	498 - 514
42	May 5	Impulse and Momentum	6/8	498 - 514
43	May 7	Impulse and Momentum	6/8	498 - 514
44	May 9	Review		
	May 14	Final Exam		