

ENGR 3063 Dynamics

Fall 2006

Department of Physics and Engineering
University of Central Oklahoma

Location	Howell Hall 100
Time	TR 9:00 – 10:15 a.m.
Instructor	Evan Lemley, Ph.D.; Assoc. Prof. of Physics and Engineering
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Office Hours	MWF 10:00 a.m. - 11:00 a.m. or by appointment.
Final	T December 12, 2006 from 9:00 - 10:50 a.m.

Course Description

This course provides an introduction to the dynamics of particles and bodies that includes the principles of work, energy, impulse, and momentum applied to translating and rotating rigid bodies.

Prerequisites

- Statics & Calc. 3 (or concurrent enrollment in Calc. 3)

Textbooks

Engineering Mechanics - Dynamics, 6/E, J.L. Meriam and L.G. Kraige, 0-471-73931-6, J. Wiley, 2007.

OR

Engineering Mechanics - Dynamics, 5/E, J.L. Meriam and L.G. Kraige, 0-471-40645-7, J. Wiley, 2002.

Homework will come out of the 5th edition.

Objectives

The student will be able to

1. Demonstrate understanding of kinematics (geometrical aspects) of particle motion
2. Apply Newton's Laws using force and acceleration to determine a particle's motion
3. Apply Work-Energy and Conservation of Energy principles to determine a particle's motion
4. Apply Principle of Impulse and Momentum and Principle of Conservation of Momentum to determine a particle's motion
5. Apply Newton's Laws using force and acceleration to determine a rigid body's motion in a plane
6. Apply Work-Energy and Conservation of Energy principles to determine a rigid body's motion in a plane
7. Apply Principle of Impulse and Momentum and Principle of Conservation of Momentum to determine a rigid body's motion in a plane
8. Demonstrate understanding of kinematics and kinetics of a rigid body moving in three dimensions

Calculator

You must own a scientific calculator – see *the list of allowed calculators for exams in the Department of Physics and Engineering*. **Please bring your calculator to class for each meeting.**

http://evan.lemley.org/courses/allowed_calculators_fall_2004.pdf

Engineering Paper

Engineering Paper -- available from the UCO bookstore, Thompson's Bookstore, and Triangle A&E at Broadway Ext. and 63rd. Please use engineering paper for all homework assignments.

Internet & E-mail

Access to the Internet and ability to send and receive E-mail. If you do not have a computer at home you can use machines on the UCO campus: Look at <http://technology.ucok.edu/support/microcomplab.htm> for a full list of available general use computers on campus.

Portable Electronic Devices (including cell phones)

Please turn off any portable electronic devices (esp. cell phones) during class. You may not access any portable electronic device during exams except calculators that are on the approved list for Physics and Engineering courses.

Instruction Techniques

Lecture will be used predominantly although sometimes recitation periods will be employed.

Class Polices

Attendance is not required, but you will responsible for any announcements or notes from class (and quizzes).

Attendance is mandatory for all exams or other graded activities (e.g. project competitions or presentations).

Cheating or academic dishonesty of any kind will not be tolerated.

Homework

Working HW problems in a timely manner is the best way to do well on exams and in the class as a whole. Homework is due at the beginning of the class period on the due-date or due-day. Homework should be neatly written on only one side of your paper, folded length-wise with your name written on the outside of the folded pages before turning it in. Each problem should fit all of the following criteria: clearly labeled, **one problem per sheet of paper**, legible and organized. HW papers that do not fit these criteria will be penalized accordingly. See the attached HW Format section for details on the presentation of HW problems. You may also visit the following site for an electronic version of the homework format requirements:

http://evan.lemley.org/courses/hwk_format.php

Each HW problem you turn in is worth ten points. Some problems will be graded on detailed solutions and others will be graded on effort. I will **not** tell you ahead of time which or how many problems will be graded relative to a detailed solution, but on the returned and graded HW paper a check mark next to the problem number will indicate full effort (or ten points) and a numerical score (e.g. 8/10) next to the problem number will be used on those problems under more scrutiny.

Grading Policies

The following table shows the breakdown of credit for the course.

HW and Misc.	10%
Exams (x3)	20%
Final Exam	30%
Total	100%

Tentative Grading Scale

90-100% -- A, 80-90% -- B, 70-80% -- C, 60-70% -- D, <60% -- F

STUDENT INFORMATION SHEET / SYLLABUS ATTACHMENT

Go to:

<http://www.busn.ucok.edu/academicaffairs/FORMS/Student%20Information%20SheetFal06.pdf>

Tentative ENGR 3063 Dynamics Schedule					
Week #	Day	Date	Topics and Activities	Text Sections	Covered
1	T	08/22/2006	Syllabus and Introduction & Rectilinear Kinematics	1/1-1/8 & 2/1-2/2	
	R	08/24/2006	General Curvilinear Motion in Rectangular Components w/ Projectile Motion	2/4	
2	T	08/29/2006	Curvilinear Motion: Normal and Tangential Components	2/5	
	R	08/31/2006	Curvilinear Motion: Normal and Tangential Components	2/5	
3	T	09/05/2006	Curvilinear Motion: Cylindrical Components	2/6	
	R	09/07/2006	Curvilinear Motion: Cylindrical Components	2/6	
4	T	09/12/2006	Absolute Dependent Motion and Relative Motion	2/9	
	R	09/14/2006	Newton's Laws for particles and systems of particles	3/1-3/3	
5	T	09/19/2006	Newton's Law's in Rectangular Coordinates - Examples	3/4	
	R	09/21/2006	Newton's Law's Normal and Tangential Coordinates	3/5	
6	T	09/26/2006	Newton's Law's in Cylindrical Coordinates	3/5	
	R	09/28/2006	Exam 1		
7	T	10/03/2006	Work Calculation, Conservative Forces, and Potential Energy	3/6 – 3/7	
	R	10/05/2006	Principle of Work and Energy for Particles and Systems of Particles	3/6 – 3/7	
8	T	10/10/2006	Linear Impulse and Momentum Principle for Particles and Systems	3/8-3/9	
	R	10/12/2006	Conservation of Momentum and Collisions (Impact)	3/9 & 3/12	
9	T	10/17/2006	Collisions (Impact)	3/12	
	R	10/19/2006	FALL BREAK – NO CLASS		
10	T	10/24/2006	Angular Momentum; and Angular Momentum and Impulse Principle	3/10	
	R	10/26/2006	Rigid-Body Motion -- Translation & Rotation About a Fixed Axis	5/1 & 5/2	
11	T	10/31/2006	Absolute General Planar Motion & Relative Motion Analysis for Velocity	5/3 – 5/4	
	R	11/02/2006	Exam 2		
12	T	11/07/2006	Relative Motion Analysis for Velocity and Instantaneous Center	5/4 – 5/5	
	R	11/09/2006	Relative Motion Analysis for Acceleration and Rotating Axes	5/6 – 5/7	
13	T	11/14/2006	Moment of Inertia and Planar Kinetic Equations	6/2	
	R	11/16/2006	Kinetics Equations for General Plane Motion	6/2-6/5	
14	T	11/21/2006	Work of a Force and a Couple	6/6	
	R	11/23/2006	THANKSGIVING BREAK – NO CLASS		
15	T	11/28/2006	Work and Energy; and Energy Conservation	6/6	
	R	11/30/2006	Linear and Angular Momentum	6/8	
16	T	12/05/2006	Exam 3		
	R	12/07/2006	Principle of Impulse and Momentum and Conservation of Momentum	6/8	
17	T	12/12/2006	FINAL EXAM --- T December 12, 2006 from 9:00 - 10:50 a.m.		