

COURSE IMPLEMENTATION DATE:	Fall 1999
COURSE REVISED IMPLEMENTATION DATE:	September 2002
COURSE TO BE REVIEWED:	September 2006
(Four years after implementation date)	(MONTH YEAR format)

**OFFICIAL COURSE OUTLINE INFORMATION**

Students are advised to keep course outlines in personal files for future use.

Shaded headings are subject to change at the discretion of the department and the material will vary - see course syllabus available from instructor

FACULTY/DEPARTMENT:	<b>Science: Physics/Engineering</b>	
<b>ENGR 113</b>	<b>PHYSICS 113</b>	<b>4</b>
COURSE NAME/NUMBER	FORMER COURSE NUMBER	UCFV CREDITS
<b>Engineering Physics - Statics &amp; Dynamics</b>		
COURSE DESCRIPTIVE TITLE		

**CALENDAR DESCRIPTION:**

This course is specifically designed for students who wish to pursue a career in engineering. The emphasis of this course will be on solving realistic problems. In place of the normal laboratory period, a weekly problem-solving and tutorial period is used to sharpen problem-solving skills. Topics include Newton's laws, kinematics, statics, and dynamics for particles and systems of particles, static and rotational equilibrium, analysis of structures, planar motion of rigid bodies, energy and momentum conservation.

PREREQUISITES: **Physics 111; Math 111**  
 COREQUISITES: **None**

SYNONYMOUS COURSE(S)	<b>SERVICE COURSE TO:</b>
(a) Replaces: <b>PHYSICS 113</b>	<b>Physics/Engineering Transfer Program</b>
(Course #)	(Department/Program)
(b) Cannot take: <b>PHYSICS 113</b> for further credit.	
(Course #)	(Department/Program)

TOTAL HOURS PER TERM: <b>90</b>	TRAINING DAY-BASED INSTRUCTION
<b>STRUCTURE OF HOURS:</b>	LENGTH OF COURSE: _____
Lectures: _____ Hrs	HOURS PER DAY: _____
Seminar: _____ Hrs	
Laboratory: _____ Hrs	
Field Experience: _____ Hrs	
Student Directed Learning: _____ Hrs	
Other (Specify): _____ Hrs	

MAXIMUM ENROLLMENT:	<b>36</b>
EXPECTED FREQUENCY OF COURSE OFFERINGS:	<b>Once/year, possibly twice</b>
<b>WILL TRANSFER CREDIT BE REQUESTED? (lower-level courses only)</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>WILL TRANSFER CREDIT BE REQUESTED? (upper-level requested by department)</b>	<input type="checkbox"/> Yes <input type="checkbox"/> No
<b>TRANSFER CREDIT EXISTS IN BCCAT TRANSFER GUIDE:</b>	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No

**AUTHORIZATION SIGNATURES:**

Course Designer(s): _____	Chairperson: _____
R. Woodside, revised P. Mulhern	N. Weinberg; revised E. Camm ( <i>Curriculum Commit</i> )
Department Head: _____	Dean: _____
G. McGuire; revised P. Mulhern	K.W. Welsh; revised J. Snodgrass
PAC Approval in Principle Date: _____	PAC Final Approval Date: December 14, 2001

**LEARNING OBJECTIVES / GOALS / OUTCOMES / LEARNING OUTCOMES:**

The student will:

- gain a thorough grasp of Newtonian mechanics, using the technique of free body diagrams
- develop a feel for the order of magnitude of mechanical quantities in realistic situations
- improve his or her problem-solving skills by doing a large number of problems
- gain a taste for the emphasis on computation required for engineering analysis
- learn the standard format for engineering solutions

**METHODS:**

The course will be presented using lectures and tutorials. Approximately ten problems per week will be handed in and marked. During the tutorial the marked assignments will be discussed, additional problems in the same general area will be dealt with, and help will be given for those needing it for the next assignment set. There will be a close coordination between the lecture topics and the tutorials.

**PRIOR LEARNING ASSESSMENT RECOGNITION (PLAR):**

Credit can be awarded for this course through PLAR (Please check :)  Yes  No

**METHODS OF OBTAINING PLAR:**

Relevant industrial experience

**TEXTBOOKS, REFERENCES, MATERIALS:**

[Textbook selection varies by instructor. An example of texts for this course might be:]

R.C. Hibbeler, Engineering Mechanics (Statics and Dynamics), 9<sup>th</sup> ed., 2000.

F.P. Beer, E.R. Johnston, Vector Mechanics for Engineers, S.I. Metric Ed., 1981 McGraw-Hill

**SUPPLIES / MATERIALS:**

Engineering Grade Paper and simple drawing instruments

**STUDENT EVALUATION:**

[An example of student evaluation for this course might be:]

Assignments	15%
Midterm	30%
Final exam	55%

**COURSE CONTENT:**

[Course content varies by instructor. An example of course content might be:]

<u>WEEK</u>	<u>TOPIC</u>	<u>TEXT</u>
1	Introduction to mechanics, fundamental concepts and principles, systems of units, solution methods and numerical accuracy. Vectors.	Ch 1, 1.1 – 1.6 Ch 2.1 – 2.3
2-2.5	Newton's laws, forces as vectors, free body diagrams and Equilibrium of	Ch 3, 3.1 – 3.4 Ch 4, 4.1 – 4.5
2.5-3	Rigid body equilibrium, torques as vector cross products, equivalent forces and couples. Loadings and distributed forces	Ch 4, 4.4 – 4.10
4	Rigid body equilibrium in two and three dimensions	Ch 5, 5.1 – 5.7
5	Analysis of structures (trusses and frames)	Ch 6, 6.1 -6.4

6	Friction-wedges, square threaded screws, journal bearings, thrust bearings, rolling resistance, belt friction.	Ch 8, 8.1 – 8.3
7	Virtual Work, Conservative Forces and Potentials	
8 – 9	Particle kinematics – rectilinear and curvilinear motion (radial and tangential components)	Ch 11, 11.1 – 11.7
10	Newton's second law, linear and angular momentum, Central force problems	Ch 12, 12.1 – 12.9
11	Energy and Momentum conservation – work-kinetic energy theorem, momentum-impulse theorem, conservative forces	Ch 13, 13.1 – 13.7
12	Systems of particles, work and energy, momentum and angular momentum	Ch 14 pp. 655-729 14.1 – 14.6
13	Systems of particles, Momentum and Impulse, Angular Momentum and Angular Impulse	Ch 15, 15.1 – 15.7