UNIVERSITY COLLEGE of the FRASER VALLEY

COURSE IMPLEMENTATION DATE: September 1999
COURSE REVISED IMPLEMENTATION DATE: September 2006
COURSE TO BE REVIEWED: November 2009
(Four years after UPAC final approval date) (MONTH YEAR)

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
- see course syllabus available from instructor

FACULTY/DEPARTMENT: Faculty of Science, Health & Human Services/Physics

ENGR 113	PHYSICS 113	4
COURSE NAME/NUMBER	FORMER COURSE NUMBER	UCFV CREDITS

Engineering Physics - Statics & Dynamics
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)
(a) Replaces: PHYSICS 113 *(Course #)*
(b) Cannot take PHYSICS 113 *(Course #)* for further credit.

SERVICE COURSE TO:
Physics/Engineering Transfer Program *(Department/Program)*
(Department/Program)

TOTAL HOURS PER TERM: 90
STRUCTURE OF HOUR

Lectures:	45	Hrs
Seminar:	45	Hrs
Laboratory:		Hrs
Field Experience:		Hrs
Student Directed Learnin		Hrs
Other (Specify):		Hrs

TRAINING DAY-BASED INSTRUCTION
LENGTH OF COURSE:
HOURS PER DAY:

MAXIMUM ENROLLMENT: 36
EXPECTED FREQUENCY OF COURSE OFFERINGS: Once/year, possibly twice

WILL TRANSFER CREDIT BE REQUESTED? (lower-level courses only)	☐ Yes	☐ No
WILL TRANSFER CREDIT BE REQUESTED? (upper-level requested by departm	☐ Yes	☐ No
TRANSFER CREDIT EXISTS IN BCCAT TRANSFER GUIDE:	☒ Yes	☐ No

AUTHORIZATION SIGNATURES:

Course Designer(s): R. Woodside, revised P. Mulhern
Chairperson: Gilliian Mimmack *(Curriculum Committee)*
Department Head: Norm Taylor
Dean: Jackie Snodgrass
UPAC Approval in Principle Date:
UPAC Final Approval Date: December 14, 2005

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 qualities 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
- be able to solve various problems in each of the topic areas listed in the Calendar Description section

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:

Departmental Review and/or Course Challenge

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), 9th 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:]

WEEK	TOPIC	TEXT
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