COURSE OUTLINE

Please save a copy onto your computer before filling in the form

Course Name: Mechanics 1

Department Head/Coordinator: Andy Sellwood **Effective Date:** Sept 2015

School or Centre:	**Department**:
School of Arts and Science	Science
Course History:	**Year of Study**:
New Course	1st Year Post-secondary
Name of Replacing Course (if applicable):	**Course Number:** PHYS 1170
	Number of Credits: 3.0

Course Pre-requisites (if applicable):

Physics 1 (PHYS 1100) and Calculus 1 (MATH 1100), both with a C-

Course Co-requisites (if applicable):

PLAR (Prior Learning Assessment & Recognition) ☒ No ☐ Yes (details below):

Course Description:

This course covers 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. It is designed for engineering students. The emphasis of this course will be on solving problems.

Note to instructors: *An instructional strategy is an approach that an instructor uses to achieve the learning outcomes (e.g., lecture, case study, video, group work).*

Instructional Strategies:

Lectures and problem-solving sessions.

Course Learning Outcomes:

At the end of the course the student will be able to:
-Add forces and resolve them into components using the Parallelogram Law.
-Express force and position in Cartesian vector form and determine the vector's magnitude and direction.
-Apply the dot product.
-Solve particle equilibrium problems using the equations of equilibrium.
-Calculate the moment of a force in two and three dimensions and the moment of a force about a specified axis.
-Determine the resultants of nonconcurrent force systems.
-Reduce a simple distributed loading to a resultant force having a specified location.
-Solve rigid body equilibrium problems using the equations of equilibrium.
-Analyze the equilibrium of rigid bodies subjected to this force.
-Apply frictional force analysis on wedges, screws, belts, and bearings.
-Represent particle motion in 1D graphically.
-Investigate particle motion along a curved path using different coordinate systems.
-Analyze the dependent motion of two particles and the accelerated motion of a particle using the equation of motion with different coordinate systems.
-Apply central-force motion to problems in space mechanics.
-Apply work and energy to solving problems involving force, velocity, and displacement.
-Solve problems using the concepts of power, energy conservation, impulse, conservation of linear momentum, angular impulse and the conservation of angular momentum.

Program Learning Outcomes:

If this course is taken as a requirement or an elective in the following first year, University Transfer Certificate programs, the learning outcomes are found in the Program Content Guides available at the Counselling and Advising Service areas:

University Transfer Engineering Certificate

Evaluation/Grading System *(Click on drop down box arrows to see list of options)*

Grading System	Specify if 'Other':	Specify Passing Grade:
Letter Grades		D

Components and Weighting of the Assessment/Evaluation Plan: *(Click on drop down box arrows to see list of options)*

Type	Percentage	Evaluation Plan (provide a brief explanation for each component especially if value exceeds 35%):
Assignments	10	
Quizzes/Tests	10	
Midterm Exam	50	2-3 midterm exams
Final Exam	30	
Total	**100**	

Learning Environment/Type *(Select all that are used within the course)*

Instruction Type	Hours Per Instruction Type	Comments
L - Classroom	60	
Enter Total Hours	**60**	

Resource Material(s):

Resources are items in addition to tuition that the student is responsible for purchasing. Course resource information will be supplied by the department/instructor.

Course Topics and Sequence Covered:

Force Vectors (vector algebra, components)
Point Equilibrium (free-body-diagram, 3 equations & variables)
Moments (torque, cross-product, force-couples)
Rigid Body Equilibrium (force+moment-balance, 6 equations)
Friction (sliding, static)
Kinematics (v, a, t-, x-dependent, cylindrical coordinates)
Kinetics (F=ma problems in various coordinates)
Work & Energy (trick for some x-dependent force problems)
Momentum (conservation, collisions)
Rotational motion, fixed axis or limited to plane

VCC Education and Education Support Policies

There are a number of **Education** and **Education Support** policies that govern your educational experience at VCC, please familiarize yourself with them.

The policies are located on the VCC web site at:

http://www.vcc.ca/about/governance--policies/policies/

To find out how this course transfers, visit the BC Transfer Guide at www.bctransferguide.ca.

FOR COMMITTEE USE ONLY

Date Approved by Education Council:	CC: March 17, 2015	**Date Approved by VCC Board (if applicable)**:	