ORIGINAL COURSE IMPLEMENTATION DATE:	September 1999
REVISED COURSE IMPLEMENTATION DATE:	January 2018
COURSE TO BE REVIEWED: (six years after UEC approval)	August 2023

Course outline form version: 09/15/14

OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

Note: The University reserves the right to amend course outlines as needed without notice.

Course Code and Number: ENGR 113

Number of Credits: 4 Course credit policy (105)

Course Full Title: Engineering Physics - Statics & Dynamics

Course Short Title (if title exceeds 30 characters): Statics & Dynamics

Faculty: Faculty of Science

Department (or program if no department): PHYSICS

Calendar Description:

This course emphasizes solution techniques and proper documentation for problems involving practical applications of Newton's laws to engineering situations.

Prerequisites (or NONE):	MATH 111 and PHYS 111.
Corequisites (if applicable, or NONE):	NONE
Pre/corequisites (if applicable, or NONE):	NONE

Equivalent Courses (cannot be taken for additional credit)

Former course code/number: **PHYS 113**

Cross-listed with:

Equivalent course(s): **PHYS 113**

Note: Equivalent course(s) should be included in the calendar description by way of a note that students with credit for the equivalent course(s) cannot take this course for further credit.

Transfer Credit

Transfer credit already exists: ☒ Yes ☐ No

Transfer credit requested (OReg to submit to BCCAT):
☐ Yes ☒ No (if yes, fill in transfer credit form)

Resubmit revised outline for articulation: ☐ Yes ☒ No

To find out how this course transfers, see **bctransferguide.ca**.

Total Hours: 90

Typical structure of instructional hours:

Lecture hours	45
Seminars/tutorials/workshops	45
Laboratory hours	
Field experience hours	
Experiential (practicum, internship, etc.)	
Online learning activities	
Other contact hours:	
Total	**90**

Special Topics

Will the course be offered with different topics?
☐ Yes ☒ No

If yes, different lettered courses may be taken for credit:
☐ No ☐ Yes, repeat(s) ☐ Yes, no limit

Note: The specific topic will be recorded when offered.

Maximum enrolment (for information only): 36

Expected frequency of course offerings (every semester, annually, every other year, etc.): Once/year, possibly twice

Department / Program Head or Director: Jeff Chizma	**Date approved:**	May 2017
Faculty Council approval	**Date approved:**	May 26, 2017
Campus-Wide Consultation (CWC)	**Date of posting:**	n/a
Dean/Associate VP: Lucy Lee	**Date approved:**	May 26, 2017
Undergraduate Education Committee (UEC) approval	**Date of meeting:**	August 31, 2017

Learning Outcomes

Upon successful completion of this course, students will be able to:

- Accurately make free body diagrams for single objects and structures
- Use Newton's Laws to model and analyze practical situations in statics and dynamics
- Properly choose from multiple co-ordinate systems to simplify the analysis
- Use kinematics, energy, or momentum as appropriate for a situation
- Properly document a solution in the standard format for engineering/industrial applications

Prior Learning Assessment and Recognition (PLAR)

☒ Yes ☐ No, PLAR cannot be awarded for this course because

Typical Instructional Methods (guest lecturers, presentations, online instruction, field trips, etc.; may vary at department's discretion)

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.

Grading system: Letter Grades: ☒ Credit/No Credit: ☐ Labs to be scheduled independent of lecture hours: Yes ☐ No ☒

NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.

Typical Text(s) and Resource Materials (if more space is required, download Supplemental Texts and Resource Materials form)

	Author (surname, initials)	Title (article, book, journal, etc.)	Current ed.	Publisher	Year
1.	Hibbeler, R.C.	Engineering Mechanics (Statics and Dynamics), 14th ed.	☒	Pearson	2015
2.	Beer, F.; Johnston, E.R.; Mazurek D.; Cornwell, P.	Vector Mechanics for Engineers, S. I. Metric Ed.	☒	McGraw Hill	2015
3.			☐		

Required Additional Supplies and Materials (software, hardware, tools, specialized clothing, etc.)

Engineering Grade Paper and simple drawing instruments.

Typical Evaluation Methods and Weighting

Final exam:	40%	Assignments:	15%	Midterm exam:	25%	Practicum:	%
Quizzes/tests:	20%	Lab work:	%	Field experience:	%	Total:	100%

Details (if necessary):

Typical Course Content and Topics

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, and belt friction.	Ch 8, 8.1-8.3
7-8	Particle kinematics – rectilinear and curvilinear motion (radial and tangential components).	Ch 12, 12.1-12.9
9	Newton's second law on dynamic systems.	Ch 13, 13.1-13.6
10	Work and Energy Conservation – work-kinetic energy theorem, momentum-impulse theorem, conservative forces.	Ch 14, 14.1-14.6
11	Inpulse and momentum.	Ch 15 15.1-15.4
12	Planar kinematics: geears and linkages. Momentum and Angular Impulse.	Ch 16, 16.1-16.7