



**CAMOSUN COLLEGE**  
**School of Arts & Science**  
**Department of Physics & Astronomy**

**PHYS-140-001**  
**Physics for Science/ENGR 1**  
**Fall 2019**

**COURSE OUTLINE**

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The course description is available on the web @ <http://camosun.ca/learn/calendar/current/web/phys.html>

$\Omega$  Please note: This outline will not be kept indefinitely. It is recommended students keep this outline for their records, especially to assist in transfer credit to post-secondary institutions.

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**1. Instructor Information**

(a) Instructor	Nancy McLean	
(b) Office hours	Mon., Wed., Thurs., Fri: 11:30-12:30 pm; Tues: 1:30 – 2:30 pm, Or by appointment	
(c) Location	F346B	
(d) Phone	250-370-3515	Alternative: _____
(e) E-mail	<a href="mailto:McLeanN@camosun.bc.ca">McLeanN@camosun.bc.ca</a>	
(f) Website	D2L	

**2. Intended Learning Outcomes**

Upon completion of the course the student will be able to:

1. Apply techniques of vector algebra to solve problems where vectors sum to zero or calculate resultant vectors.
  - a. Perform coordinate system conversions.
  - b. Demonstrate operations of vector addition and subtraction using graphical, vector component and unit vector techniques.
  - c. Calculate and interpret scalar product and vector products.
2. Solve problems involving particle kinematics and dynamics for translational motion with non-constant force.
  - a. Apply kinematic equations to analyze motion of objects subject to constant acceleration.
  - b. Use calculus to analyze motion of objects with non-constant acceleration.
  - c. Use vector components to analyze motion in two and three dimensions.
  - d. Solve problems for objects undergoing uniform and non-uniform circular motion.
  - e. State and apply Newton's Laws to analyze systems subject to concurrent forces including friction, inclines and connected objects.
3. Analyze the rotational motion of rigid bodies.
  - a. Calculate the center-of-mass and moment-of-inertia for uniform objects including the parallel-axis theorem.
  - b. Perform calculations and answer conceptual questions using torques. Solve equilibrium problems for non-concurrent forces.
  - c. Define the rotational kinematic quantities; transform between linear and rotational quantities.
  - d. Use the rotational form of Newton's 2nd Law to solve dynamics problems.
  - e. Apply translational and rotational conditions of mechanical equilibrium.
4. Use work-energy theorem and other conservation laws to solve applied problems.
  - a. Solve problems involving work by constant and non-constant forces in two and three dimensions.
  - b. Calculate work, energy and power for rotational systems.

- c. Perform calculations utilizing the conservation of momentum of isolated systems for elastic and inelastic collisions.
  - d. Perform calculations utilizing the conservation of angular momentum for rotating systems.
5. Apply concepts of dynamics, work and energy to analyze charged particles in electric and magnetic fields.
    - a. Calculate electric fields, forces, potential and potential energy for point charges and simple charge distributions.
    - b. Perform calculations for charged particles moving in uniform electric and magnetic fields; describe their motion and practical applications.
    - c. Solve problems for multi-branch direct current circuits using Ohm's Laws and Kirchhoff's Rules.
  6. Examine the validity of key physical principles through the use of practical experimental techniques.
    - a. Assemble experimental apparatus using written instructions.
    - b. Observe and record data including sources of error and estimate the range of uncertainty in results.
    - c. Interpret meaning of experimental results in the context of the experimental objectives.
    - d. Write scientific reports in correct format.

### 3. Required Materials

(a) Texts

Physics for Scientists & Engineers, 4<sup>th</sup> edition, Randall D. Knight

(b) Other

Physics 140/141 Laboratory Manual

Graph paper (must be either 10 lines/inch or millimeter graph paper)

### 4. Course Content and Schedule

Class Times:	Monday – Thursday	8:30 – 9:20 am	F322
Lab Times:	Friday	8:30 – 10:20 am	F322

### 5. Basis of Student Assessment (Weighting)

The student must be successful in both the theory and laboratory assignments to pass the course. The approximate percentages used for the final grading are:

Term Tests	30%
Homework	5%
Lab Report	15%
Lab Exam	10%
Final Exam (3 hours)	40%

#### PHYSICS DEPARTMENT GUIDELINES REGARDING TESTING AND GRADING:

- The final exam will cover the entire course and will be 3 hours long. As stated in the current college calendar, “students are expected to write tests and final exams at the scheduled time and place.” Exceptions will only be considered due to emergency circumstances as outlined in the calendar. Holidays or scheduled flights are not considered to be emergencies.
- Students must write quizzes, tests, midterm tests, etc., on the date and time assigned by the instructor. Missed exams normally receive a zero grade. Instructors are not required to provide make-up tests. At their discretion, instructors may waive a test in exceptional circumstances such as medical issues or a documented illness.

- Any outstanding homework or labs must be submitted prior to the last day of classes, and will be graded according to the late policy outlined by the instructor.
- Refer to your instructor's information page for any additional policies regarding testing and grade calculation.

#### PHYSICS DEPARTMENT GUIDELINES REGARDING LABS:

- Students must obtain an overall grade of 50% or higher in the laboratory component of the course order to obtain credit for the course.
- Attendance is mandatory & you may be required to "sign in" at the beginning of each lab period. A lab may be waived or made up at a later time only in the case of documented illness or other extenuating circumstances. If you will be absent from a lab period due to illness it is your responsibility to notify your instructor.
- Unless otherwise stated by your instructor late penalties are as follows: For overdue labs (or assignments), a late penalty of 1 mark per day (10%) will be assessed for the first five days following the due date. After this date a complete report is still required and earns a maximum mark of 50%.
- At the discretion of the instructor, a student who is repeating this Physics course with a laboratory grade of 70% or higher may apply for lab exemption.
- Students will complete a minimum of 9 laboratory experiments including 3 formal reports (with full uncertainty calculations) and at least at least one lab using technology to perform data analysis.

## 6. Grading System

- Standard Grading System (GPA)
- Competency Based Grading System

## 7. Recommended Materials to Assist Students to Succeed Throughout the Course

## 8. College Supports, Services and Policies



### Immediate, Urgent, or Emergency Support

If you or someone you know requires immediate, urgent, or emergency support (e.g. illness, injury, thoughts of suicide, sexual assault, etc.), **SEEK HELP**. Resource contacts @ <http://camosun.ca/about/mental-health/emergency.html> or <http://camosun.ca/services/sexual-violence/get-support.html#urgent>

### College Services

Camosun offers a variety of health and academic support services, including counselling, dental, disability resource centre, help centre, learning skills, sexual violence support & education, library, and writing centre. For more information on each of these services, visit the **STUDENT SERVICES** link on the College website at <http://camosun.ca/>

## College Policies

Camosun strives to provide clear, transparent, and easily accessible policies that exemplify the college's commitment to life-changing learning. It is the student's responsibility to become familiar with the content of College policies. Policies are available on the College website at <http://camosun.ca/about/policies/>. Education and academic policies include, but are not limited to, Academic Progress, Admission, Course Withdrawals, Standards for Awarding Credentials, Involuntary Health and Safety Leave of Absence, Prior Learning Assessment, Medical/Compassionate Withdrawal, Sexual Violence and Misconduct, Student Ancillary Fees, Student Appeals, Student Conduct, and Student Penalties and Fines.

### A. GRADING SYSTEMS <http://camosun.ca/about/policies/index.html>

The following two grading systems are used at Camosun College:

#### 1. Standard Grading System (GPA)

Percentage	Grade	Description	Grade Point Equivalency
90-100	A+		9
85-89	A		8
80-84	A-		7
77-79	B+		6
73-76	B		5
70-72	B-		4
65-69	C+		3
60-64	C		2
50-59	D		1
0-49	F	Minimum level has not been achieved.	0

#### 2. Competency Based Grading System (Non GPA)

This grading system is based on satisfactory acquisition of defined skills or successful completion of the course learning outcomes

Grade	Description
COM	The student has met the goals, criteria, or competencies established for this course, practicum or field placement.
DST	The student has met and exceeded, above and beyond expectation, the goals, criteria, or competencies established for this course, practicum or field placement.
NC	The student has not met the goals, criteria or competencies established for this course, practicum or field placement.

### B. Temporary Grades

Temporary grades are assigned for specific circumstances and will convert to a final grade according to the grading scheme being used in the course. See Grading Policy at <http://camosun.ca/about/policies/index.html> for information on conversion to final grades, and for additional information on student record and transcript notations.

Temporary Grade	Description
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I	<i>Incomplete:</i> A temporary grade assigned when the requirements of a course have not yet been completed due to hardship or extenuating circumstances, such as illness or death in the family.
IP	<i>In progress:</i> A temporary grade assigned for courses that are designed to have an anticipated enrollment that extends beyond one term. No more than two IP grades will be assigned for the same course.
CW	<i>Compulsory Withdrawal:</i> A temporary grade assigned by a Dean when an instructor, after documenting the prescriptive strategies applied and consulting with peers, deems that a student is unsafe to self or others and must be removed from the lab, practicum, worksite, or field placement.