



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

**PHYS-140-002AB**  
**Physics for Science/ENGR 1**  
**Fall 2018**

## COURSE OUTLINE

---

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.

---

### 1. Instructor Information

(a) Instructor	Christopher Avis (Lecture Instructor and Lab Instructor section 002A)		
(b) Office hours	Mon., Wed., Fri.: 11:30 AM -12:20 PM*, Tue., Thu.: 12:30 PM-1:20 PM		
(c) Location	Fisher 346D		
(d) Phone	250-370-3460	Alternative:	N/A
(e) E-mail	avisc@camosun.bc.ca		
(f) Website	D2L (online.camosun.ca)		

(a) Instructor	Edgar Nelson (Lab Instructor section 002B)		
(b) Office hours	TBA		
(c) Location	TBA		
(d) Phone	250-370-4435	Alternative:	N/A
(e) E-mail	nelson@camosun.bc.ca		
(f) Website	D2L (online.camosun.ca)		

\* I will occasionally have to cancel Monday and Wednesday office hours due to scheduled Curriculum Committee meetings; cancellations will be announced well in advance and I will be available from 8:30-9:20 on those days.

### 2. Intended Learning Outcomes

*(If any changes are made to this part, then the Approved Course Description must also be changed and sent through the approval process.)*

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 and Engineers, 4<sup>th</sup> Edition, Knight, R.D. (Optional)
- (b) Other: Physics 140/141 Laboratory Manual, Scientific Calculator, Ruler

### 4. Course Content and Schedule

Monday:	Lecture: 9:30 AM – 10:20 AM	Fisher 322
Wednesday:	Lecture: 9:30 AM – 10:20 AM	Fisher 202
Wednesday	002B Lab: 2:30 PM – 4:30 PM	Fisher 322
Thursday:	Lecture: 9:30 AM – 10:20 AM	Fisher 322
Thursday	002A Lab: 1:30 PM – 3:20 PM	Fisher 316
Friday:	Lecture: 9:30 AM – 10:20 AM	Fisher 322

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

- (a) Homework: 5%                      (b) Lab Reports: 15%                      (c) Lab Exam: 10 %
- (d) Term Tests: 30%                      (e) Final Exam: 40 %

Tests are scheduled as follows:

Section 002A

**Test #1: Thurs. Sept. 27<sup>th</sup>,**  
**Test #2: Thurs. Oct. 25<sup>th</sup>,**  
**Test #3: Thurs. Nov. 22<sup>nd</sup>,**  
**Lab Exam: Thurs. Dec. 6<sup>th</sup>**

Section 002B

**Test #1: Weds. Sept. 26<sup>th</sup>,**  
**Test #2: Weds. Oct. 24<sup>th</sup>,**  
**Test #3: Weds. Nov. 21<sup>st</sup>,**  
**Lab Exam: Weds. Dec. 5<sup>th</sup>**

## INSTRUCTOR SPECIFIC POLICIES

1. Homework for a particular week will cover up to whatever section is finished on the last lecture of that week. It will be due at the end of the day on the following Friday and will be checked for completeness.
2. Labs for a particular week will be due by the end of the day one week following the lab. Each student is allowed one dropped or missed lab.
3. Please refer to the D2L website regularly for important announcements and an up-to-date calendar with due dates and test dates.
4. Missed tests and labs will only be excused if I am contacted within 24 hours of the absence and with proper supporting documentation provided (counselor's note, doctor's note, etc...). Otherwise, a mark of zero will be assigned.

## PHYSICS DEPARTMENT POLICIES REGARDING TESTING:

1. The final exam will cover the entire course and will be 3 hours long. As stated in the current college calendar on page 39, "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.
2. 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.

## PHYSICS DEPARTMENT POLICIES REGARDING LABS:

1. Lab attendance is mandatory – you cannot complete a lab using someone else's data and 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.
2. 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 earns a maximum mark of 50%.
3. At the discretion of the instructor, a student who is repeating this Physics course may apply for lab exemption.

## **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
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.