



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

**PHYS-070-001**  
**College Prep Physics**  
**Winter 2020**

## **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**

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|-------------------------|---|
| <b>(a) Instructor</b>   | Elizabeth Ploughman   |
| <b>(b) Office hours</b> | Mon,: 1:30 -2:20 Tues Wed 9:30-10:20 thurs 10:30 -11:20 and 5:20-5:50 Fri<br>no office hrs  |
| <b>(c) Location</b>     | F 314B  |
| <b>(d) Phone</b>        | 250 370 3517 <b>Alternative:</b>  |
| <b>(e) E-mail</b>       | <a href="mailto:ploughe@camosun.bc.ca">ploughe@camosun.bc.ca</a> note: during the term your emails will be read but the large number of emails make individual replies to technical questions about homework etc. impossible. Such questions will be responded to in class as I will include their answers in the next lecture. So DO email to send information (such as you have to miss class due to illness) to me or to ask questions about homework. If you must have a reply that can not wait until class or office hours (due to some sort of emergency) then use the phone, my priority is to answer phone messages first as students only phone me, now that is the 21 <sup>st</sup> century,if they are truly in need of assistance. When there is a phone message a red light (not seen often lately) begins to flash in my office. |
| <b>(f) Website</b>      |   |
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### **2. Intended Learning Outcomes**

Upon successful completion of this course a student will be able to:

1. Develop basic measurement skills and apply these skills in a laboratory data analysis. In particular:
  - a. Solve problems involving SI units,
  - b. Maintain the correct number of significant numbers in calculations,
  - c. Use uncertainties in measurements, and
  - d. Define vector and scalar quantities.
2. Employ knowledge of kinematics to study problems involving one-dimensional motion. In particular:
  - a. Use the language and concepts of kinematics to describe motion,
  - b. Analyze and solve kinematics problems in one dimension,
  - c. Construct and interpret displacement versus time curves,
  - d. Construct and interpret velocity versus time graphs, and
  - e. Solve problems involving uniform acceleration.
3. Apply knowledge of dynamics to solve problems involving forces and conservation of momentum and energy. In particular:

- a. Use the language and concepts of dynamics to describe forces and energy,
  - b. Analyze and solve dynamics problems in one dimension using free body diagrams,
  - c. Apply Newton's laws of motion in one dimension,
  - d. Solve problems involving:
    - i. Friction forces
    - ii. Gravitational forces involving Newton's Law of Universal Gravitation,
  - e. Analyze and solve problems in kinetic and potential energy,
  - f. Analyze and solve problems in energy conservation,
  - g. Solve problems involving work and power, and
  - h. Solve problems involving impulse and conservation of momentum in one dimension.
4. Use knowledge of electricity to solve problems involving electrostatics and DC circuits. In particular:
- a. Use the language and concepts of electricity to describe electrical phenomena,
  - b. Analyze and solve problems using Coulomb's law,
  - c. Analyze and solve problems involving Ohm's law,
  - d. Define and distinguish between electric potential difference, resistance and current, and
  - e. Solve simple DC resistance problems involving series, parallel and combination circuits.
5. Apply knowledge of heat energy to solve problems involving heat transfer and describe heat transfer mechanisms. In particular:
- a. Use the language and concepts of thermodynamics to describe the transfer of heat and energy,
  - b. Define and distinguish between temperature, heat energy and specific heat capacity,
  - c. Analyze and solve problems in heat energy, and
  - d. Demonstrate an understanding of the different mechanisms of heat transfer.
6. Use the language and concepts of physics to examine and describe wave phenomena and solve related problems. In particular:
- a. Define and distinguish between amplitude, wavelength, frequency, waves speed and period,
  - b. Analyze and solve problems involving wave phenomena – refraction, reflection, total internal reflection,
  - c. Describe various wave phenomena and the conditions which produce them,
  - d. Solve problems involving the lens equation and the mirror equation, and
  - e. Construct ray diagrams for mirrors and lenses
7. Observe and analyze experiments in a laboratory involving kinematics, dynamics, conservation of momentum/energy, electricity and heat and draw appropriate conclusions from these experiments. Laboratory assessment will include:
- a. Collecting data through observation:
    - i. Record a measurement to the appropriate level of precision,
    - ii. Recognize that all measured values have an uncertainty,
  - b. Constructing graphs:
    - i. Choose appropriate scales,
    - ii. Determine line of best fit,
    - iii. Label correctly,
  - c. Drawing conclusions from observations and data
    - i. Identify and discuss sources of error,
    - ii. Calculate and interpret the slope of a line,
    - iii. Relate conclusions to objectives,
  - d. Calculating experimental error:
    - i. Determine % error and % difference where appropriate

### 3. Required Materials

- (a) Texts “Elements of Applied Physics” by John Betts this text has been printed up on campus as the soft cover Camosun “Course pack for physics 070” to save you money
- b) Tutorial pack, 2 duotangs or other light folders, graph paper, calculator with trig functions, ruler, pens (erasable pens are allowed)
- c) Lab manual

## 4. Course Content and Schedule

**Each class** (excluding midterm classes) will consist of a 2 hour lecture (with a short break in the middle where time allows) followed by an hour of tutorial or lab work

**Midterms** there will be the best two out of three 1 hour midterms the 1<sup>st</sup> after five weeks approximately and the 2<sup>nd</sup> after 10 weeks. The exact dates will be announce 1 week before the midterm  
**\*tests must be written on the assigned time and date unless medical documentation (which can include the opinion of a college counsellor) is submitted. No rewrite is ever allowed!**

Final exam is 3 hours long and its date is posted by administration after the semester is underway. It will be during the exam week (however)

## 5. Basis of Student Assessment (Weighting)

(a) **tutorials** 10% in total 6% of this will be for your corrected homework and tutorial assignments and 4% for attendance

b) **labs** 10% **experiments must be completed at the assigned time and date unless medical documentation (which can include the opinion of a college counsellor) is submitted. Reports are due one week after the experiment is completed**

c) **Exams** midterms 30% total, 3 hour final 50%

### 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 7 labs of which at least one will be completed as a formal report.

## 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.