



**School of Arts & Science  
PHYSICS DEPARTMENT**

**PHYS 105-002,001  
General College Physics 2  
Winter, 2017**

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## **COURSE OUTLINE**

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

Ω Please note: this outline will be electronically stored for five (5) years only.  
It is strongly recommended students keep this outline for your records.

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### **1. Instructor Information**

Instructor: Elizabeth ploughman  
Office Hours: Mon-Wed. (11:30-2:20) or by appointment  
Location: F314B  
Phone: 250-370-3517  
Email: [ploughe@camosun.bc.ca](mailto:ploughe@camosun.bc.ca)  
Website Info: Please ph and leave a call back number if you need a reply after term begins

### **2. Intended Learning Outcomes**

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

1. Define and describe the following properties of waves: period, frequency, wave speed, and amplitude. State the principal of superposition and understand the properties of waves undergoing constructive and destructive interference.
2. State the conditions for standing waves and identify nodes and anti-nodes. Solve problems of vibrating strings and air columns, including fundamental nodes and harmonics.
3. Solve technical problems involving the behaviour of light at an interface between media (laws of reflection, refraction, dispersion).
4. Solve technical problems involving geometric optics (lenses, mirrors, simple optic devices).
5. Solve technical problems involving the electrostatic force, the electric field and potential.
6. Solve technical problems associated with simple DC circuits and networks of batteries and resistors in series and parallel circuits, Ohm's Law and electric power.
7. Solve technical problems involving magnetic fields due to current-carrying wires, magnetic forces between wires and on charged particles, and the practical application of magnetism.
8. Assemble simple experimental apparatus using written instructions.
9. Observe, record, organize and display data in tables, graphs or charts.
10. Analyze linear graphs (determine area, slope, intercept, etc.).
11. Observe and record sources of error and estimate the range of uncertainty in results.
12. Interpret meaning of experimental results in the context of the experimental objectives.
13. Write scientific reports in an acceptable, traditional format.



### 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	Minimum level of achievement for which credit is granted; a course with a "D" grade cannot be used as a prerequisite.	1
0-49	F	Minimum level has not been achieved.	0

### 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 E-1.5 at [camosun.ca](http://camosun.ca) 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, due to design may require a further enrollment in the same course. No more than two IP grades will be assigned for the same course. (For these courses a final grade will be assigned to either the 3 <sup>rd</sup> course attempt or at the point of course completion.)
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.

## 7. Recommended Materials or Services to Assist Students to Succeed

### STUDY TIME

It is recommended that between 5 and 10 hours per week (or more for students with a weak background) be spent studying for this course outside of class time.

### LEARNING SUPPORT AND SERVICES FOR STUDENTS

There are a variety of services available for students to assist them throughout their learning. This information is available in the College calendar, at Student Services or the College web site at [camosun.ca](http://camosun.ca).

### STUDENT CONDUCT POLICY

There is a Student Conduct Policy **which includes plagiarism**. It is the student's responsibility to become familiar with the content of this policy. The policy is available in each School Administration Office, at Student Services and on the College web site in the Policy Section. [www.camosun.bc.ca/divisions/pres/policy/2-education/2-5.html](http://www.camosun.bc.ca/divisions/pres/policy/2-education/2-5.html)

### OUTLINE:

1. **Wave motion (Ch. 11.1, 11.7, 11.8, 11.11 - 11.13)**
  - 1.1 Descriptive Simple harmonic motion
  - 1.2 Properties of waves; wave speed
  - 1.3 Reflection and interference
  - 1.4 Standing waves in a string
  
2. **Sound (Ch. 12.1, 12.4, 12.6, 12.7)**
  - 2.1 Characteristics of sound; the human ear
  - 2.2 Vibrating strings and air columns
  - 2.3 Interference; Beats
  - 2.4 *OPTIONAL: The Doppler effect (12.7)*
  
3. **Light and geometric optics (Ch. 23) and (Ch. 25.1 – 25.6)**
  - 3.1 Speed of light. Electromagnetic spectrum
  - 3.2 Law of Reflection; Image formation in plane mirrors
  - 3.3 Image formation in plane and spherical mirrors
  - 3.4 Law of Refraction
  - 3.5 Total internal reflection and applications
  - 3.6 Image formation in thin lenses. Lenses in combination
  - 3.7 **Selected** optical instruments (magnifier, microscopes, telescopes, the eye) (25.1 – 25.6)
  
4. **Electric Fields (Ch. 16.1 – 16.8) and (Ch. 17.1, 17.2)**
  - 4.1 Basic idea of electric charge and its relation to matter
  - 4.2 Law of electrostatic force
  - 4.3 Electric fields and field line (Qualitative)
  - 4.4 Electric potential; Potential difference and E-field (17.1, 17.2)
  
5. **Electricity (Ch. 18.1 – 18.6) and (Ch. 19.1, 19.2, 19.4)**
  - 5.1 Electric current; the electric battery
  - 5.2 Ohm's Law; Resistance
  - 5.3 Resistance; Resistivity *OPTIONAL: Temperature dependence.*
  - 5.4 Power
  - 5.5 Emf and simple DC circuits (19.1, 19.2, 19.4)
  
6. **Magnetic fields (Ch. 20.1 – 20.4, 20.10, 20.11)**
  - 6.1 Properties of magnets
  - 6.2 The magnetic field
  - 6.3 Magnetic forces on moving charges; current-carrying wires
  - 6.4 Applications; Hall effect, Electric motors, Mass spectrometer
  
7. **OPTIONAL TOPIC:** Picked by instructor at the beginning of term. About 1 weeks worth of material. It is the decision of the instructor if students are responsible for material on the final exam.  
Examples: Descriptive Relativity, Geophysics, Astrophysics