



**School of Arts & Science**  
**PHYSICS DEPARTMENT**  
**PHYS 105-1**  
**General College Physics 2**  
**2011P**

## **COURSE OUTLINE**

### **Approved Course description**

#### **PHYS 105 GENERAL COLLEGE PHYSICS 2**

Physics 105 continues the survey of general college physics topics, including properties of vibrations, wave motion and sound, geometric optics, the properties of electric and magnetic fields and simple D.C. circuits. Together, Physics 104 and Physics 105 satisfy laboratory science requirements for students in non-science programs.

OFFERED:	Winter, Spring
CREDIT:	4
IN-CLASS WORKLOAD:	4 lecture, 2 lab
PRE-/CO-REQUISITES:	Physics 104 or departmental assessment

### **1. Instructor Information**

(a)	Instructor:	Wilf Nienaber		
(b)	Office Hours:			
(c)	Location:	T 218, F346C		
(d)	Phone:	250-370-4435	Alternative Phone:	
(e)	Email:	<a href="mailto:nienaber@camosun.bc.ca">nienaber@camosun.bc.ca</a>		
(f)	Website:	<a href="http://www.nienaber.disted.camosun.bc.ca">www.nienaber.disted.camosun.bc.ca</a>		

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

*(No changes are to be made to this section, unless the Approved Course Description has been forwarded through EDCO for approval.)*

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 principle 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.

### 3. Required Materials

- (a) Texts      Physics, Principles with Applications, 6<sup>th</sup> edition, Douglas C. Giancoli
- (b) Other      Physics 104/105 Laboratory Manual  
                     Graph paper (must be either 10 lines/inch or millimeter graph paper)

### 4. Course Content and Schedule

*(Can include: class hours, lab hours, out of class requirements and/or dates for quizzes, exams, lectures, labs, seminars, practicums, etc.)*

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

*(Should be linked directly to learning outcomes.)*

The student must be successful ( $\geq 60\%$ ) in both the theory and laboratory assignments to pass the course. The approximate percentages used for the final grading are:

Quizzes	40%
Lab Work	10%
Final Exam (3 hours)	50%

### DEPARTMENT POLICIES REGARDING TESTING:

1. Students must write quizzes, tests, midterm tests, etc., on the date and time assigned by the instructor. Missed exams normally receive a zero grade. In exceptional circumstances such as medical issues or a documented illness, a make-up exam may be given or the test may be waived at the discretion of the instructor. The instructor should be notified prior to the exam.
2. The final exam will cover the entire course and will be 3 hours long. As stated in the current college calendar (p. 39) "students are expected to write tests and final exams at the scheduled time and place." Exceptions will only be considered for emergency circumstances as outlined in the calendar. Excursions, holidays or scheduled travel flights are not accepted.
3. Cell phones are not permitted in the exam room during tests or during the final exam.

### DEPARTMENT POLICIES REGARDING LABS:

1. Lab exercises will be done on a bi-weekly basis during the scheduled lab period. Attendance is mandatory and you will be required to "sign in" at the beginning of each one. If, at the end of the lab period, it becomes necessary to complete your report at home, your data must be reviewed and signed (initialed) by the instructor before leaving the lab.
2. All assigned laboratory exercises and reports must be completed with an overall grade of 60% in order to obtain credit for this course. Attendance is required for all lab exercises at the scheduled times. A lab may be made up at a later time only in the case of documented illness or other extenuating circumstances.
3. Late Penalties: Reports for labs will normally be due at the end of the lab period. Reports for labs requiring at home completion will be due at the beginning of the next lab period. For overdue labs, a late penalty of one 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 5/10.
4. At the discretion of the instructor, a student who is repeating this Physics course may not be required to complete the laboratory exercises a second time if an average lab grade of 70% or better was obtained.

## 6. Grading System

*(No changes are to be made to this section, unless the Approved Course Description has been forwarded through EDCO for approval.)*

### 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
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<b>I</b>	<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.
<b>IP</b>	<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.)
<b>CW</b>	<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 Throughout the Course

### 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.

### 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