



CAMOSUN COLLEGE
Arts and Science
Physics Department

PHYS 192 Physics 192 – Physics 2 Civil/Mechanical Engineering Technology
Quarter 2, 2007
MECHANICAL SECTION X02

COURSE OUTLINE

The Approved Course Description is available on http://intranet/ed_prov/CentralizedCurriculum.php
the web @

Ω Please note: This outline will not be kept indefinitely. It is recommended students keep this outline for their records.

1. Course Instructor Information

Instructor Nancy Luick
Office hours Monday to Friday: 11:30 – 12:30 pm or by appointment
Location Tech 219
Phone 370-4471
E-mail luick@camosun.bc.ca
Website luick.disted.camosun.bc.ca

2. Intended Learning Outcomes

At the end of the course the student will be able to:

1. Impulse, the concept of conservation of momentum of isolated systems, including elastic and inelastic collisions, and angular momentum.
2. The Simple Harmonic Motion of a mass and spring system and the simple pendulum, including equations of motion, energy, and graphical representations.
3. Waves in various media (sound and light), including types of waves, wave functions, wave speed, and interference of waves.
4. Fundamental thermal physics, including thermometry conversions, specific heat, latent heat, and thermal expansion.
5. Static electricity (the Coulomb force, electric force field, electric potential and potential difference).
6. Current electricity (Ohm's Law, resistors in series, parallel and combination circuits).
7. The effect of magnetic fields on moving point charges and on current-carrying wires.

3. Required Materials

Textbook: "Physics", 7th edition, Cutnell, J. D. and Johnson, K. W.
Other: Physics 191/192 Laboratory Manual
Graph paper (must be either 10 lines/inch or millimeter graph paper)

4. Course Content and Schedule

Class Times:	Monday	8:30 - 10:20 am	Tech 222
	Tuesday	8:30 - 9:20 am	Tech 173
	Wed., Thurs.	8:30 - 9:20 mm	Tech 222
Lab Time:	Friday	8:30 - 10:20 am	Tech 222

5. Basis of Student Assessment (Weighting)

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:

Best 3 out of 4 one-hour tests	40%
Lab Work	10%
Final Exam (3 hours)	50%

Midterm tests may be discounted from the grading distribution (see above) if all term work, including term tests, labs, and assignments, has been completed and is 60% or higher. In this case, the final grade for the course may be based on a combination of the final exam (90%) and the lab mark (10%).

LATE POLICY: Late labs/assignments will be given a penalty of 25% per week.

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. Instructors are not required to provide make-up tests. At their discretion, instructors may waive a test or provide a make-up test only in the event of documented illness or other extenuating circumstances.

PHYSICS DEPARTMENT POLICIES REGARDING LABS:

1. All five assigned laboratory exercises and reports must be completed and handed in prior to the date of the final exam with an overall grade of 60% in order to obtain credit for this course. 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 to make arrangements to complete the lab prior to the end of classes for Q2.
2. At the discretion of the instructor, a student who is repeating this Physics course may apply for lab exemption.

6. Grading System

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|-------------------------------------|---------------------------------|
| <input checked="" type="checkbox"/> | Standard Grading System (GPA) |
| <input type="checkbox"/> | Competency Based Grading System |

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, Student Services or the College web site at <http://www.camosun.bc.ca>

STUDENT CONDUCT POLICY

There is a Student Conduct Policy. It is the student's responsibility to become familiar with the content of this policy. The policy is available in each School Administration Office, Registration, and on the College web site in the Policy Section.

<http://www.camosun.bc.ca/policies/policies.html>

The following two grading systems are used at Camosun College:

1. Standard Grading System (GPA)

Percentage	Grade	Description	Grade Point Equivalency
95-100	A+		9
90-94	A		8
85-89	A-		7
80-84	B+		6
75-79	B		5
70-74	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://www.camosun.bc.ca/policies/E-1.5.pdf> 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.

COURSE CONTENT:

1. Impulse and Momentum

- 1.1 Impulse – momentum theorem
- 1.2 Conservation of linear momentum
- 1.3 Collisions
 - 1.3.1 One-dimensional collisions
 - 1.3.2 Two-dimensional collisions
- 1.4 Angular momentum

2. Simple Harmonic Motion

- 2.1 Physics of a spring
 - 2.1.1 Hooke's law
 - 2.1.2 Springs in series and parallel
 - 2.1.3 Potential energy
- 2.2 Simple harmonic motion
 - 2.2.1 Period, frequency, and amplitude
 - 2.2.2 Equations for displacement, velocity and acceleration in terms of time
 - 2.2.3 Graphs of displacement, velocity and acceleration as functions of time
 - 2.2.4 Maximum velocity and acceleration
- 2.3 Simple pendulum

3. Waves

- 3.1 Properties of waves
 - 3.1.1 Types of waves – transverse/longitudinal
 - 3.1.2 Speed, period, wavelength and amplitude of waves
 - 3.1.3 Speed of wave on a string
 - 3.1.4 The wave function for transverse waves
 - 3.1.5 Wave speed and particle speed
- 3.2 Sound waves
 - 3.2.1 Properties
 - 3.2.2 Speed of sound in solids, liquids, and gases and temperature dependence
 - 3.2.3 The wave function for longitudinal waves
- 3.3 Principle of linear superposition
 - 3.3.1 Constructive and destructive interference
 - 3.3.2 Standing waves – transverse and longitudinal
 - 3.3.3 The standing wave function

4. Thermal Properties of Matter

- 4.1 Temperature scales
- 4.2 Thermometers
- 4.3 Thermal expansion
 - 4.3.1 Linear expansion - Thermal stress
 - 4.3.2 Volume expansion
- 4.4 Thermal energy
 - 4.4.1 Specific heat
 - 4.4.2 Latent heat
 - 4.4.3 Calorimetry

5. **Electricity**

5.1 Electrostatics

- 5.1.1 Charges as constituents of matter
- 5.1.2 Conductors and insulators and semiconductors
- 5.1.3 Charging processes – charge by induction
- 5.1.4 Coulomb's law
- 5.1.5 Electric fields
- 5.1.6 Electric potential energy, potential and potential difference

6 **Current Electricity**

- 6.1 Electric current
- 6.2 Ohm's Law
- 6.3 Resistivity, resistances in series and parallel
- 6.4 Power
- 6.5 Simple D. C. circuits
- 6.6 Kirchhoff's Rules

7. **Electromagnetism**

- 7.1 Magnets and the magnetic field
- 7.2 Magnetic fields of currents – long straight wire, loop and coil
- 7.3 Force on a moving charge
- 7.4 Force on a current in a magnetic field
- 7.5 Electromagnetic induction and Faraday's Law