

COURSE SYLLABUS



COURSE TITLE: PHYS-105: General College Physics 2

CLASS SECTION: 002 A/B

TERM: 2022W

COURSE CREDITS: 4

DELIVERY METHOD(S): Lecture

Camosun College campuses are located on the traditional territories of the Ləkʷəŋən and W̱SÁNEĆ peoples. We acknowledge their welcome and graciousness to the students who seek knowledge here.

Learn more about Camosun's [Territorial Acknowledgement](#).

For COVID-19 information please visit <https://legacy.camosun.ca/covid19/index.html>.

Camosun College requires mandatory attendance for the first class meeting of each course. If you do not attend, and do not provide your instructor with a reasonable explanation in advance, you will be removed from the course and the space offered to the next waitlisted student.

INSTRUCTOR DETAILS

NAME: Lecture: Stephanie Ingraham Labs: 002A- Elizabeth Ploughman, 002B- Arezoo Hosseini

EMAIL: IngrahamS@camosun.bc.ca

OFFICE: F346C

HOURS: Monday- Thursday 12:30- 1:20pm

As your course instructor, I endeavour to provide an inclusive learning environment. However, if you experience barriers to learning in this course, do not hesitate to discuss them with me. Camosun College is committed to identifying and removing institutional and social barriers that prevent access and impede success.

CALENDAR DESCRIPTION

PHYS 105 continues the survey of General College Physics topics. Students will explore properties of vibrations, wave motion and sound, geometric optics, the properties of electric and magnetic fields and simple DC circuits.

PREREQUISITE(S):

All of:

- C in PHYS 104

CO-REQUISITE(S):

Not Applicable

EXCLUSION(S):

Not Applicable

COURSE LEARNING OUTCOMES / OBJECTIVES

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

1. Examine common physical systems subject to periodic motion and study the propagation of waves on strings and in air columns.
 - a. Apply Hooke's Law and elastic potential energy to problems involving mass-spring systems
 - b. Define the terms period, frequency and angular frequency and evaluate these quantities for mass-spring systems and simple pendulums.
 - c. State the principle of superposition and describe the properties of waves undergoing constructive and destructive interference.
 - d. Compare and contrast wave propagation on strings and in air columns including wave speed dependence on medium characteristics.
 - e. Solve problems involving the Doppler effect and beats
 - f. State the conditions for standing waves and apply these conditions to solve technical problems of vibrating strings and air columns, including fundamental modes and harmonics.

2. Investigate laws of geometric optics and use them to solve technical problems involving refraction, reflection, and image formation (in mirrors and lenses).
 - a. State laws of reflection and refraction and apply laws to calculate paths of light rays at interfaces between materials.
 - b. Solve technical problems involving dispersion and total internal reflection as special applications of refraction.
 - c. Solve technical problems involving image formation with spherical mirrors, lenses and simple optical devices (cameras, the eye, simple magnifiers, microscopes and telescopes), including ray diagrams.

3. Apply concepts of dynamics, work and energy to analyze the behavior of charged particles in electric fields.
 - a. Calculate electric fields, forces, potential and potential energy for point charges and simple charge distributions.
 - b. Solve technical problems involving the motion of charged particles moving in uniform electric fields
 - c. Solve technical problems involving energy storage in capacitors and combinations of capacitors.

4. Use principles of electrical energy transfer to solve problems involving multi-branch Direct Current
 - a. Apply the concept of resistivity to calculate the resistance of a resistor with specified geometry
 - b. Use Ohm's Law to determine the current flow through a resistor.
 - c. Calculate the power output of electrical devices.
 - d. Identify the characteristics of current, resistance and voltage in series and parallel circuits and apply these concepts to the analysis of multi-branch circuits involving networks of resistors and batteries
 - e. Outline the effect of internal resistance in batteries and appropriately account for its effects in circuit analysis.
 - f. Solve multi-branch electric circuit problems using Kirchoff's Laws.
 - g. Set up simple DC circuits and demonstrate the use of a multimeter to measure resistance, current and voltage

5. Investigate the source of magnetic fields, forces on charges in magnetic fields and applications of magnetism to electromagnetic induction.
 - a. Describe the origin of magnetic fields and calculate the magnetic field produced by long wires and solenoids
 - b. Calculate the forces acting on charged particles and wire loops in uniform magnetic fields.
 - c. Describe the concept of magnetic flux, induced emf and back emf and relate these concepts to the function of electric motors and generators
 - d. Solve technical problems involving Faraday's Law of Induction, Lenz's Law and motional emf.

6. Explore key experiments that led to the development of modern quantum theory.
 - a. Describe the photoelectric effect experiment and the photon model of light.
 - b. Solve technical problems involving energy carried by photons and the photoelectric effect.
 - c. Apply Bohr's model of the atom to solve technical problems involving energy transitions in the hydrogen atom.

7. Analyze, interpret, and report on experimental results in the context of experimental objectives.
 - a. Observe, record, organize and display data in tables, and record sources of error and determine the uncertainty in results
 - b. Plot and analyze linear graphs (determine area, slope, intercept, including uncertainties)
 - c. Convey findings in scientific reports written in an acceptable, traditional discipline-specific format

REQUIRED MATERIALS & RECOMMENDED PREPARATION / INFORMATION

(a) PHYS 105 Lab Manual- Mandatory

(b) Texts- Optional
Physics by Giancoli, 7th Edition

(c) Other
Scientific calculator, ruler, protractor.

COURSE SCHEDULE, TOPICS, AND ASSOCIATED PREPARATION / ACTIVITY / EVALUATION

Lectures: Monday, Wednesday, Thursday, Friday 11:30- 12:20 pm F322

PHYS 105 002A Lab: Tuesday 2:30-4:20 pm F322

PHYS 105 002B Lab: Tuesday 11:30-1:20 pm F322

The following schedule and course components are subject to change with reasonable advance notice, as deemed appropriate by the instructor.

Date	Lecture Topic: PHYS 105
WEEK #1	
Monday, Jan. 10 th	Course Outline and Uncertainties Review
Tuesday, Jan. 11 th	LAB
Wednesday, Jan. 12 th	Uncertainties Review/ 1.1 Intro to Simple Harmonic Motion
Thursday, Jan. 13 th	1.2 Hooke's Law
Friday, Jan. 14 th	1.3 Energy in SHM
WEEK #2	
Monday, Jan. 17 th	1.4 The Simple Pendulum
Tuesday, Jan. 18 th	LAB
Wednesday, Jan. 19 th	1.5 Damped Harmonic Motion, 1.6 Forced Harmonic Motion *Add/drop date
Thursday, Jan. 20 th	2.1 Properties of Waves
Friday, Jan. 21 st	2.2 Wave Speed, 2.3 Superposition of Waves
WEEK #3	
Monday, Jan. 24 th	2.4 Standing Waves on a String
Tuesday, Jan. 25 th	LAB
Wednesday, Jan. 26 th	3.1 Characteristics of Sound
Thursday, Jan. 27 th	3.2 The Decibel Scale
Friday, Jan. 28 th	3.3 Standing Waves in Air Columns
WEEK #4	
Monday, Jan. 31 st	3.4 Interference and Beats
Tuesday, Feb. 1 st	Test 1- Modules 1 and 2
Wednesday, Feb. 2 nd	3.5 The Doppler Effect
Thursday, Feb. 3 rd	4.1 Properties of Light
Friday, Feb. 4 th	4.2 Plane Reflection
WEEK #5	
Monday, Feb. 7 th	4.3 Image Formation by Spherical Mirrors
Tuesday, Feb. 8 th	LAB
Wednesday, Feb. 9 th	4.4 Refraction
Thursday, Feb. 10 th	4.5 Image Formation by Thin Lenses
Friday, Feb. 11 th	4.6 Combination of Lenses, 4.7 Optical Instruments
WEEK #6	
Monday, Feb. 14 th	5.1 Electric Charge and Methods of Charging
Tuesday, Feb. 15 th	LAB
Wednesday, Feb. 16 th	5.2 Insulators and Conductors
Thursday, Feb. 17 th	5.3 Coulomb's Law
Friday, Feb. 18 th	5.4 The Electric Field
WEEK #7	
Monday, Feb. 21 st	Reading Break
Tuesday, Feb. 22 nd	Reading Break
Wednesday, Feb. 23 rd	Reading Break
Thursday, Feb. 24 th	Reading Break
Friday, Feb. 25 th	Reading Break
WEEK #8	
Monday, Feb. 28 th	6.1 Electric Potential and Electric Potential Energy
Tuesday, Mar. 1 st	Test 2- Modules 3 and 4
Wednesday, Mar. 2 nd	6.2 Equipotentials and Field Lines, 6.3 Electric Potential due to Point Charges

Thursday, Mar. 3 rd	6.4 Capacitance
Friday, Mar. 4 th	6.5 Combinations of Capacitors
WEEK #9	
Monday, Mar. 7 th	Vector Review
Tuesday, Mar. 8 th	LAB
Wednesday, Mar. 9 th	7.1 Electric Current, 7.2 Ohm's Law
Thursday, Mar. 10 th	7.3 Power and Household Electricity
Friday, Mar. 11 th	7.4 Resistivity and Internal Resistance
WEEK #10	
Monday, Mar. 14 th	7.5 Series and Parallel Circuits
Tuesday, Mar. 15 th	LAB
Wednesday, Mar. 16 th	7.6 Mixed Circuits
Thursday, Mar. 17 th	7.7 Kirchhoff's Rules
Friday, Mar. 18 th	7.7 Kirchhoff's Rules

WEEK #11	
Monday, Mar. 21 st	8.1 Properties of Magnets
Tuesday, Mar. 22 nd	Test 3- Modules 5 and 6
Wednesday, Mar. 23 rd	8.2 The Magnetic Field
Thursday, Mar. 24 th	8.3 Types of Magnets
Friday, Mar. 25 th	8.4 The Magnetic Force, 8.5 Magnetic Torque
WEEK #12	
Monday, Mar. 28 th	8.6 Ampere's Law
Tuesday, Mar. 29 th	LAB
Wednesday, Mar. 30 th	8.7 The Magnetic Force between Parallel Wires
Thursday, Mar. 31 st	8.8 Magnetic Fields of Current Loops and Solenoids
Friday, April 1 st	8.9 Applications of Magnetism
WEEK #13	
Monday, April 4 th	9.1 Induced EMF
Tuesday, April 5 th	LAB
Wednesday, April 6 th	9.2 Faraday's Law of Induction and Lenz' Law
Thursday, April 7 th	9.3 EMF Induced in a Moving Conductor
Friday, April 8 th	10.1 The Photoelectric Effect
WEEK #14	
Monday, April 11 th	10.2 Bohr's Theory of the Atom
Tuesday, April 12 th	Test 4- Modules 7 and 8
Wednesday, April 13 th	Exam Review
Thursday, April 14 th	Exam Review
Friday, April 15 th	No Class- College Closed

Note that the tests will take place in the lab period on the following dates:

Test 1- Tuesday February 1st

Test 2- Tuesday March 1st

Test 3- Tuesday March 22nd

Test 4- Tuesday April 12th

Students registered with the Centre for Accessible Learning (CAL) who complete quizzes, tests, and exams with academic accommodations have booking procedures and deadlines with CAL where advanced noticed is

required. Deadlines can be reviewed on the [CAL exams page](http://camosun.ca/services/accessible-learning/exams.html). <http://camosun.ca/services/accessible-learning/exams.html>

EVALUATION OF LEARNING

DESCRIPTION	WEIGHTING
Homework	10%
Labs	20%
Term Tests (best 3 out of 4)	35%
Final Exam	35%
	TOTAL
	100%

If you have a concern about a grade you have received for an evaluation, please come and see me as soon as possible. Refer to the [Grade Review and Appeals](http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf) policy for more information. <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf>

COURSE GUIDELINES & EXPECTATIONS

- Course content, announcements, and important class information will be posted on d2L. Students must check d2L regularly.
- Homework problems will be assigned at the beginning of a particular week and will be due by the end of the day (11:59 PM) on the Friday of the following week. Any submissions after this time will be considered late. See below for late policies. Homework will be marked based on completion.
- Homework can be submitted in person at the end of class or uploaded to the d2L “Assignments” folder.
- Four midterm tests will occur at the dates and times listed above. Out of the four midterm tests, the lowest midterm grade will be dropped for each student, ie. the best three out of four midterm grades will be used to make up the 35% weighting.
- Labs will take place in the lab period on Tuesday of each week. The due date for each lab report will be determined by the lab instructor. Students must be present in the lab to take their own data. Each student is allowed one dropped or missed lab.
- If a lab or test is missed due to illness or extenuating circumstances, students must contact their lecture or lab instructor within 24 hours of the missed lab or test. Otherwise, the lab or test will be assigned a zero grade.

SCHOOL OR DEPARTMENTAL INFORMATION

PHYSICS DEPARTMENT GUIDELINES REGARDING TESTING AND GRADING:

- 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 illness and 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 illness.
- Any outstanding homework or labs must be submitted prior to the final exam date 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.
- 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.

STUDENT RESPONSIBILITY

Enrolment at Camosun assumes that the student will become a responsible member of the College community. As such, each student will display a positive work ethic, assist in the preservation of College property, and assume responsibility for their education by researching academic requirements and policies; demonstrating courtesy and respect toward others; and respecting expectations concerning attendance, assignments, deadlines, and appointments.

SUPPORTS AND SERVICES FOR STUDENTS

Camosun College offers a number of services to help you succeed in and out of the classroom. For a detailed overview of the supports and services visit <http://camosun.ca/students/>.

Academic Advising

<http://camosun.ca/advising>

Accessible Learning	http://camosun.ca/accessible-learning
Counselling	http://camosun.ca/counselling
Career Services	http://camosun.ca/coop
Financial Aid and Awards	http://camosun.ca/financialaid
Help Centres (Math/English/Science)	http://camosun.ca/help-centres
Indigenous Student Support	http://camosun.ca/indigenous
International Student Support	http://camosun.ca/international/
Learning Skills	http://camosun.ca/learningskills
Library	http://camosun.ca/services/library/
Office of Student Support	http://camosun.ca/oss
Ombudsperson	http://camosun.ca/ombuds
Registration	http://camosun.ca/registration
Technology Support	http://camosun.ca/its
Writing Centre	http://camosun.ca/writing-centre

If you have a mental health concern, please contact Counselling to arrange an appointment as soon as possible. Counselling sessions are available at both campuses during business hours. If you need urgent support after-hours, please contact the Vancouver Island Crisis Line at 1-888-494-3888 or call 911.

COLLEGE-WIDE POLICIES, PROCEDURES, REQUIREMENTS, AND STANDARDS

Academic Accommodations for Students with Disabilities

The College is committed to providing appropriate and reasonable academic accommodations to students with disabilities (i.e. physical, depression, learning, etc). If you have a disability, the [Centre for Accessible Learning](http://camosun.ca/accessible-learning/) (CAL) can help you document your needs, and where disability-related barriers to access in your courses exist, create an accommodation plan. By making a plan through CAL, you can ensure you have the appropriate academic accommodations you need without disclosing your diagnosis or condition to course instructors. Please visit the CAL website for contacts and to learn how to get started:

<http://camosun.ca/services/accessible-learning/>

Academic Integrity

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.13.pdf> for policy regarding academic expectations and details for addressing and resolving matters of academic misconduct.

Academic Progress

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.1.pdf> for further details on how Camosun College monitors students' academic progress and what steps can be taken if a student is at risk of not meeting the College's academic progress standards.

Course Withdrawals Policy

Please visit <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.2.pdf> for further details about course withdrawals. For deadline for fees, course drop dates, and tuition refund, please visit <http://camosun.ca/learn/fees/#deadlines>.

Grading Policy

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.5.pdf> for further details about grading.

Grade Review and Appeals

Please visit <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf> for policy relating to requests for review and appeal of grades.

Mandatory Attendance for First Class Meeting of Each Course

Camosun College requires mandatory attendance for the first class meeting of each course. If you do not attend, and do not provide your instructor with a reasonable reason in advance, you will be removed from the course and the space offered to the next waitlisted student. For more information, please see the "Attendance" section under "Registration Policies and Procedures" (<http://camosun.ca/learn/calendar/current/procedures.html>) and the Grading Policy at <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.5.pdf>.

Medical / Compassionate Withdrawals

Students who are incapacitated and unable to complete or succeed in their studies by virtue of serious and demonstrated exceptional circumstances may be eligible for a medical/compassionate withdrawal. Please visit <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.8.pdf> to learn more about the process involved in a medical/compassionate withdrawal.

Sexual Violence and Misconduct

Camosun is committed to creating a campus culture of safety, respect, and consent. Camosun's Office of Student Support is responsible for offering support to students impacted by sexual violence. Regardless of when or where the sexual violence or misconduct occurred, students can access support at Camosun. The Office of Student Support will make sure students have a safe and private place to talk and will help them understand what supports are available and their options for next steps. The Office of Student Support respects a student's right to choose what is right for them. For more information see Camosun's Sexualized Violence and Misconduct Policy: <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.9.pdf> and camosun.ca/sexual-violence. To contact the Office of Student Support: oss@camosun.ca or by phone: 250-370-3046 or 250-3703841

Student Misconduct (Non-Academic)

Camosun College is committed to building the academic competency of all students, seeks to empower students to become agents of their own learning, and promotes academic belonging for everyone. Camosun also expects that all students to conduct themselves in a manner that contributes to a positive, supportive, and safe learning environment. Please review Camosun College's Student Misconduct Policy at <http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.5.pdf> to understand the College's expectations of academic integrity and student behavioural conduct.

Changes to this syllabus: Every effort has been made to ensure that information in this syllabus is accurate at the time of publication. The College reserves the right to change courses if it becomes necessary so that course content remains relevant. In such cases, the instructor will give the students clear and timely notice of the changes.