

COURSE SYLLABUS



COURSE TITLE: PHYS-157: Physics for Electronics

CLASS SECTION: X01A/B

TERM: Winter 2023

COURSE CREDITS: 4

DELIVERY METHOD(S): Lecture

Camosun College campuses are located on the traditional territories of the Ləkʷəŋən and WSÁNEĆ 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: Julie Alexander

EMAIL: jalex@camosun.bc.ca

OFFICE: Tech 220

HOURS: T 12:30-2:00, W 10:30-11:30, Th 12:30-2:30, F 11:30-12:00

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

This course provides an introductory survey to topics of particular interest to electronics and computer engineering students. Students will first review vectors, kinematics, Newton's Laws, work, energy and power. Students will then study torque and rotational motion, waves, light, thermal physics, static electricity and magnetism.

PREREQUISITE(S):

One of:

- C in Physics 11
- C in Camosun Alternative

And one of:

- C+ in Pre-calculus 12; C+ in MATH 097; C in MATH 107; C in MATH 115

CO-REQUISITE(S):

Not Applicable

EXCLUSION(S):

Not Applicable

COURSE LEARNING OUTCOMES / OBJECTIVES

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

1. Solve technical problems involving distance, displacement, speed, velocity and acceleration in one and two dimensions.
2. Solve problems involving the application of Newton's Laws to two or more bodies moving in one and two dimensions.
3. Solve technical problems involving torque and rotational motion.
4. Solve technical problems involving work, energy, and power.
5. 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.
6. Define and describe Simple Harmonic Motion.
7. Solve technical problems involving light reflection, refraction, critical angle and total internal reflection applications.
8. Use fundamental thermal physics, including thermometry conversions, to perform calculations involving calorimetry and specific heat.
9. Use the principles of static electricity to solve problems involving the Coulomb force, electric fields, and electric fields in capacitors.
10. Describe and solve problems involving insulators, conductors and semiconductors.
11. Describe the effects of magnetic fields, and perform calculations involving Faradays Law and Induction.
12. Assemble simple experimental apparatus using written instructions.
13. Observe record, organize and display data in tables, graphs or charts.
14. Analyze linear graphs (determine area, slope, intercept, etc.).
15. Interpret meaning of experimental results in the context of the experimental objectives.

Required Materials

- (a) Text: College Physics, A Strategic Approach, 4th ed. By Knight/Jones/Field Pearson (publisher)
(the 3rd edition of this text would also be fine)
- (b) Scientific calculator
- (c) Lab Manual

**Word and Excel are available as part of the Office 365 suite provided free to all Camosun students. See: <http://camosun.ca/services/its/other-services.html> for details.

Course Content and Schedule

Lectures: Monday 2:30-3:20
 Tuesday 10:30-11:20
 Wednesday 9:30-10:20
 Thursday 2:30-3:20

Lab: Friday 3:30-5:30

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

PHYSICS 157 Section X01A/B TIMELINE 2023 Winter

Week	Lecture 1 Monday	Lecture 2 Tuesday	Lecture 3 Wednesday	Lecture 4 Thursday tutorial	Laboratory Friday	
1 Jan 9-13	Intro SI Units Sig Fig	Kinematics Equations in 1D	Free Fall	Kinematics worksheet	No Lab	
2 Jan 16-20	Kinematic graphs	Vector Algebra in 2D	Inclined plane, projectiles	1 D Kinematics Homework #1	Lab 1 Air Track Kinematics in 1D group A	
3 Jan 23-27	Projectiles	Newtonian Dynamics intro	Newtonian Dynamics 2D	2 D Kinematics Homework #2	Lab 1 Air Track Kinematics in 1D group B	
4 Jan 30 Feb 3	Newtonian Dynamics 2 D	Test 1 Jan 31	Newtonian Dynamics Interacting Obj	Newton's Laws Homework #3	Lab 2 Atwood's Pulley group A	
5 Feb 6-10	Uniform Circular Motion	Uniform Circular Motion	Torque	Circular Motion Homework #4	Lab 2 Atwood's Pulley group B	
6 Feb 13-17	Torque	Equilibrium	Work, energy and power	Equilibrium Homework #5	Climate change talk (A & B)	
7 Feb 20-24	FAMILY DAY (College Closed)	READING BREAK (College Closed)	READING BREAK (College Closed)	READING BREAK (College Closed)	READING BREAK (College Closed)	
8 Feb 27 Mar 3	Review	Test 2 Feb 28	Conservation of Energy	Work and Energy Homework #6	tutorial	
9 Mar 6-10	Calorimetry	Calorimetry	Calorimetry	Calorimetry Homework #7	Lab 3 Specific Heat Capacity of Tin Shot group A	
10 Mar 13-17	Simple Harmonic Motion	Simple Harmonic Motion	Simple Harmonic Motion	SHM Homework #8	Lab 3 Specific Heat Capacity of Tin Shot group B	
11 Mar 20-24	Standing Waves	Standing Waves	Standing Waves	Standing Waves Homework #9	Lab 4 Standing Waves on a String (group A)	

12 Mar 27-31	Electric Field	Test 3 Mar 28	Electric Fields	Electric Fields	Lab 4 Standing Waves on a String (group B)	
13 Apr 3-7	Magnetism	Magnetism	Magnetism	Electric Fields Homework #10	Good Friday (college closed)	
14 Apr 10-14	Magnetic Fields Homework #11	Review	Review	Review	Practise final exam	

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

• Final Exam(3 hours)	41%
• Homework problems	10%
• 3 term tests (1 hour each)	39%
• 4 Labs (all labs MANDATORY)	<u>10%</u>
	100%

Important dates

Proposed dates for 1 hour tests

Jan 31, 2023

Feb 28, 2023

Mar 28, 2023

Homework

Homework problems are designed to help you master problem solving skills and prepare you for the term tests. You will be given a set of homework problems at the beginning of Lecture 4 each week. You will spend the lecture hour working on these problems with the help of classmates and the instructor. At the end of the lecture the instructor will stamp your stamp sheet. You may not be able to complete all of the problems during this hour, that is OK, you will still be given a stamp but then will be expected to complete the rest of the problems on your own time. At the end of the term stamp sheets will be collected and count towards 10% of your final grade. Test questions will be based on these problems so you want to be sure that you work through all of them. Full solutions will be posted on D2L. Your instructor has also made videos of many of these problems. The Youtube links for these videos are listed on D2L.

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 labs must be submitted prior to the last day of classes, and will be graded according to the late policy outlined by the instructor.
- Announcements and important class information will be posted on D2L. Students should check D2L regularly.

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.

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](#) (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.