COURSE SYLLABUS

COURSE TITLE: PHYS-105-General College Physics 2
CLASS SECTION: 001

TERM: 2025W

COURSE CREDITS: 3

DELIVERY METHOD(S): Synchronous, In-Person

Camosun College respectfully acknowledges that our campuses are situated on the territories of the Lək̓ʷəŋən (Songhees and Kosapsum) and WSÁNEĆ peoples. We honour their knowledge and welcome to all students who seek education here.

INSTRUCTOR DETAILS

NAME: Jean-Marc (JM) Miszaniec

EMAIL: MiszaniecJ@camosun.com

OFFICE: 365C

HOURS: T/W 10:30-11:20 AM

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):

EQUIVALENCIES:

COURSE LEARNING OUTCOMES / OBJECTIVES

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

Examine common physical systems subject to periodic motion and study the propagation of waves on strings and in air columns.

Apply Hooke's Law and elastic potential energy to problems involving mass-spring systems.

Define the terms period, frequency and angular frequency and evaluate these quantities for massspring systems and simple pendulums.

State the principal of superposition and describe the properties of waves undergoing constructive and destructive interference.

Compare and contrast wave propagation on strings and in air columns including wave speed dependence on medium characteristics.

Solve problems involving the Doppler effect and beats.

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.

Investigate laws of geometric optics and use them to solve technical problems involving refraction, reflection, and image formation (in mirrors and lenses).

State laws of reflection and refraction and apply laws to calculate paths of light rays at interfaces between materials.

Solve technical problems involving dispersion and total internal reflection as special applications of refraction.

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.

Apply concepts of dynamics, work and energy to analyze the behavior of charged particles in electric fields.

Calculate electric fields, forces, potential and potential energy for point charges and simple charge distributions.

Solve technical problems involving the motion of charged particles moving in uniform electric fields.

Solve technical problems involving energy storage in capacitors and combinations of capacitors.

Use principles of electrical energy transfer to solve problems involving multi-branch Direct Current.

Apply the concept of resistivity to calculate the resistance of a resistor with specified geometry.

Use Ohm's Law to determine the current flow through a resistor.

Calculate the power output of electrical devices.

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.

Outline the effect of internal resistance in batteries and appropriately account for its effects in circuit analysis.

Solve multi-branch electric circuit problems using Kirchoff's Laws.

Set up simple DC circuits and demonstrate the use of a multimeter to measure resistance, current and voltage

Investigate the source of magnetic fields, forces on charges in magnetic fields and applications of magnetism to electromagnetic induction.

Describe the origin of magnetic fields and calculate the magnetic field produced by long wires and solenoids.

Calculate the forces acting on charged particles and wire loops in uniform magnetic fields.

Describe the concept of magnetic flux, induced emf and back emf and relate these concepts to the function of electric motors and generators.

Solve technical problems involving Faraday's Law of Induction, Lenz's Law and motional emf.

Explore key experiments that led to the development of modern quantum theory.

Describe the photoelectric effect experiment and the photon model of light.

Solve technical problems involving energy carried by photons and the photoelectric effect.

Apply Bohr's model of the atom to solve technical problems involving energy transitions in the hydrogen atom.

Analyze, interpret, and report on experimental results in the context of experimental objectives.

Observe, record, organize and display data in tables, and record sources of error and determine the uncertainty in results.

Plot and analyze linear graphs (determine area, slope, intercept, including uncertainties).

Convey findings in scientific reports written in an acceptable, traditional discipline-specific format

REQUIRED MATERIALS & RECOMMENDED PREPARATION / INFORMATION

Required materials:

- Scientific calculator
- Ruler
- Access to a computer with Microsoft Excel. (Students can access Excel through the Microsoft Office Suite available free to students here: https://legacy.camosun.ca/services/its/other-services.html.)
- Physics 105 Lab Manual

Optional material:

- Physics by Giancoli, 7th Edition (Copies available in Lansdowne Campus Library and the Bookstore)

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

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

WEEK	Activity	Due Dates
Week 1		
Monday, January 6	Course Intro + Semester Prep	
Tuesday, January 7	1.1 Introduction to Simple Harmonic Motion	
Wednesday, January 8	1.2 Hooke's Law	
Thursday, January 9	LAB: Revision of Uncertainty and Experimental Analysis	
Friday, January 10	1.3 Energy in Simple Harmonic Motion	
Week 2		
Monday, January 13	1.4 The Simple Pendulum	
Tuesday, January 14	1.5, 1.6 Damped and Forced Harmonic Motion	
Wednesday, January 15	2.1 Properties of Waves	
Thursday, January 16	LAB: Data Analysis and Graphing	Lab Deliverable Due EOD & HW due in Lab
Friday, January 17	2.2 Wave Speed	
Week 3		
Monday, January 20	2.3 Superposition of Waves	
Tuesday, January 21	2.4 Standing Waves on a String	
Wednesday, January 22	2.4 Standing Waves on a String	
Thursday, January 23	LAB: Standing Waves on a String	Lab Deliverable Due EOD & HW due in Lab
Friday, January 24	3.1 Characteristics of Sound	
Week 4		
Monday, January 27	3.2 The Decibel Scale	
Tuesday, January 28	3.3 Standing Waves in Air Columns	
Wednesday, January 29	3.4 Interference and Beats	
Thursday, January 30	**Test #1: Module 1 & 2**	HW due in Lab
Friday, January 31	3.5 The Doppler Effect	Lab Deliverable Due EOD
Week 5		
Monday, February 3	4.1 The Nature of Light and The Ray Approximation	
Tuesday, February 4	4.2 Plane Reflection	
Wednesday, February 5	4.3 Image Formation by Spherical Mirrors	
Thursday, February 6	**LAB: Capstone Lab #1 Performed, Standing Waves in Air Column**	HW due in Lab
Friday, February 7	4.4 Refraction	
Week 6		

Monday, February 10	4.5 Image Formation by Thin Lenses	
Tuesday, February 11	4.6 Combinations of Lenses and Optical Instruments	
Wednesday, February 12	4.6 Combinations of Lenses and Optical Instruments	
Thursday, February 13	**Test #2: Modules 3 & 4**	HW due in Lab
Friday, February 14	5.1 Electric Charge and Methods of Charging	Lab Deliverable Due EOD
Week 7		
Monday, February 17	Reading week	College closed
Tuesday, February 18	Reading week	College closed
Wednesday, February 19	Reading week	College closed
Thursday, February 20	Reading week	College closed
Friday, February 21	Reading week	College closed
Week 8		
Monday, February 24	5.2 Coulomb's Law	
Tuesday, February 25	5.3 The Electric Field	
Wednesday, February 26	6.1 Electric Potential and Electric Potential Energy	
Thursday, February 27	LAB: Coulomb's Law	**Capstone Lab #1 Deliverable Due EOD & HW due in Lab**
Friday, February 28	6.1 Electric Potential and Electric Potential Energy	
Week 9		
Monday, March 3	6.2. Equipotentials and Field Lines	
Tuesday, March 4	6.3. Electric Potential due to Point Charges	
Wednesday, March 5	6.4 Capacitors	
Thursday, March 6	LAB: E-Field Lab (from 140 manual)	Lab Deliverable Due EOD & HW due in Lab
Friday, March 7	6.5 Combinations of Capacitors	
Week 10		
Monday, March 10	7.1 Electric Current	
Tuesday, March 11	7.2 Ohm's Law	
Wednesday, March 12	7.3 Power and Household Electricity	
Thursday, March 13	**Test #3: Modules 5 & 6**	HW due in Lab
Friday, March 14	7.4 Resistivity and Internal Resistance	Lab Deliverable Due EOD
Week 11		
Monday, March 17	7.5 Series and Parallel Circuits	
Tuesday, March 18	7.6 Kichoff's Laws	

Wednesday, March 19	7.6 Kichoff's Laws	
Thursday, March 20	LAB: Kirchoff's Laws	HW due in Lab
Friday, March 21	8.1 Properties of Magnets	
Week 12		
Monday, March 24	8.2 The Magnetic Field, 8.3 Types of Magnets	
Tuesday, March 25	8.4 The Magnetic Force	
Wednesday, March 26	8.5 Magnetic Torque	
Thursday, March 27	**LAB: Capstone Lab #2 Performed, TBD**	Lab Deliverable Due EOD & HW due in Lab
Friday, March 28	8.6 Ampere's Law	
Week 13		
Monday, March 31	8.7 The Magnetic Force between Parallel Wires	
Tuesday, April 1	8.8 Applications of Magnetism	
Wednesday, April 2	9.1 Induced EMF	
Thursday, April 3	**Test 4: Modules 7 & 8**	
Friday, April 4	9.2 Faraday's Law of Induction and Lenz' Law	
Week 14		
Monday, April 7	9.2 Faraday's Law of Induction and Lenz' Law	
Tuesday, April 8	9.3 Induced EMF in a Moving Conductor	
Wednesday, April 9	Lecture on 10.1 The Photoelectric Effect	
Thursday, April 10	LAB: Review Session	HW due in Lab
Friday, April 11	10.2 Bohr's Theory of the Atom	**Capstone Lab #2 due EOD**
Week 15		
April 14 - April 25	**Final Exam Period**	

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. https://camosun.ca/services/academic-supports/accessible-learning/academic-accommodations-exams

EVALUATION OF LEARNING

	WEIGHTING
Weekly Homework	10%
Labs	25%
Tests (4)	25%
Capstone Lab Reports (2)	10%
Final	30%
TOTAL	100%

COURSE GUIDELINES & EXPECTATIONS

Course content will be posted daily on d2L.

- Course content, announcements, and important class information will be posted on d2L. Students must check d2L regularly.

Homework

- Homework is due in the first 30 minutes of the lab period
- Homework is marked for completion. Criteria for completion must be met.
- Self-Assessments must be completed.
- Late homework is not accepted.

Tests

- Tests are to be completed during lab periods. Students will be given 1.5 hours to complete the tests.
- Students are allowed calculators on tests
- Formula sheets are provided by instructor

Labs

- Lab reports are due latest 11:59 PM one week after experiment is performed. Any changes in due dates or timelines will be posted on the D2L calendar.
- Labs will be submitted as a group fulfilling the specified requirements.
- Groups will switch every two lab sessions.
- Labs submitted one day late will obtain a maximum score of 60%. Additional late days decreases the max score by 10 percentage points.

Capstone Lab Reports

- The capstone lab reports are individual efforts
- The capstone report entails a formal lab report including all necessary and required sections of a formal lab.

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 emergency circumstances as outlined in the calendar. Holidays or scheduled flights are not considered to be emergencies.

- Students must write 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.

Missed Labs Guidelines:

- Laboratory activities are in-person activities; attendance and participation are required. Reports will
- not be accepted from students who did not attend the lab period.
- If you arrive more than 30 minutes late to the lab, you may be recorded as absent.
- Students who will miss a laboratory session have an obligation to seek out concessions directly from their instructor in a timely manner, BEFORE the lab period occurs. In the event of unforeseen circumstances, lab instructors must be notified within 24 hours of the missed lab period, or concessions will not be available.
- If you miss up to three (3) laboratory sessions, you are still eligible to meet the Learning Outcomes for the course, though missed labs may receive a zero grade.
- If you miss a total of four (4) or more labs for any reason including, but not limited to: life circumstances, illness, family or pet obligations, planned vacations, milestone family events, work commitments, competitive athletic event., you will be unable to meet the learning outcomes for the class and will receive a failing grade (F) in the entire course, regardless of marks received on graded lab and lecture components. Exceptions will only be considered through an academic concession granted by the instructor or Dean/Associate Dean.
- Please note that if you are suffering from a serious medical illness that prevents you from participating in this course, Camosun College has a Compassionate Medical Withdrawal Policy (https://camosun.ca/services/forms#medical)

SCHOOL OR DEPARTMENTAL INFORMATION

- **Students must obtain an overall grade of 50% or higher in the laboratory component of the course order to obtain credit for the course.**
- 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 camosun.ca/services.

Support Service	Website
Academic Advising	camosun.ca/services/academic-supports/academic-advising
Accessible Learning	camosun.ca/services/academic-supports/accessible-learning
Counselling	camosun.ca/services/health-and-wellness/counselling-centre
Career Services	camosun.ca/services/co-operative-education-and-career-services
Financial Aid and Awards	camosun.ca/registration-records/financial-aid-awards
Help Centres (Math/English/Science)	camosun.ca/services/academic-supports/help-centres
Indigenous Student Support	camosun.ca/programs-courses/iecc/indigenous-student-services
International Student Support	camosun.ca/international
Learning Skills	camosun.ca/services/academic-supports/help-centres/writing-centre-learning-skills
Library	camosun.ca/services/library
Office of Student Support	camosun.ca/services/office-student-support
Ombudsperson	camosun.ca/services/ombudsperson
Registration	camosun.ca/registration-records/registration
Technology Support	camosun.ca/services/its
Writing Centre	camosun.ca/services/academic-supports/help-centres/writing-centre-learning-skills

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 Integrity

Students are expected to comply with all College policy regarding academic integrity; which is about honest and ethical behaviour in your education journey. The following guide is designed to help you understand your responsibilities: https://camosun.libguides.com/academicintegrity/welcome
Please visit https://camosun.ca/sites/default/files/2021-05/e-1.13.pdf for Camosun's Academic Integrity policy and details for addressing and resolving matters of academic misconduct.

Academic Accommodations for Students with Disabilities

Camosun College is committed to achieving full accessibility for persons with disabilities. Part of this commitment includes arranging appropriate academic accommodations for students with disabilities to ensure they have an equitable opportunity to participate in all of their academic activities. If you are a student with a documented disability and think you may need accommodations, you are strongly encouraged to contact the Centre for Accessible Learning (CAL) and register as early as possible. Please visit the CAL website for more information about the process of registering with CAL, including important deadlines: https://camosun.ca/cal

Academic Progress

Please visit https://camosun.ca/sites/default/files/2023-02/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 https://camosun.ca/sites/default/files/2021-05/e-2.2.pdf for further details about course withdrawals. For deadline for fees, course drop dates, and tuition refund, please visit https://camosun.ca/registration-records/tuition-fees#deadlines.

Grading Policy

Please visit https://camosun.ca/sites/default/files/2021-05/e-1.5.pdf for further details about grading.

Grade Review and Appeals

Please visit https://camosun.ca/sites/default/files/2021-05/e-1.14.pdf for policy relating to requests for review and appeal of grades.

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 (see Medical/Compassionate Withdrawals policy). Please visit https://camosun.ca/services/forms#medical to learn more about the process involved in a medical/compassionate withdrawal.

Sexual Violence

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 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 Policy: https://camosun.ca/sites/default/files/2021-05/e-2.9.pdf and camosun.ca/services/sexual-violence-support-and-education.

To contact the Office of Student Support: oss@camosun.ca or by phone: 250-370-3046 or 250-370-3841

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 https://camosun.ca/sites/default/files/2021-05/e-2.5.pdf to understand the College's expectations of academic integrity and student behavioural conduct.

Looking for other policies?

The full suite of College policies and directives can be found here: https://camosun.ca/about/camosun-college-policies-and-directives

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.