

COURSE SYLLABUS



COURSE TITLE: PHYS-104-General College Physics 1

CLASS SECTION: RH04

TERM: 2024F

COURSE CREDITS: 3

DELIVERY METHOD(S): Face-to-Face

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

INSTRUCTOR DETAILS

NAME: Chris Avis

EMAIL: avisc@camosun.ca

OFFICE: F346B

HOURS: Office hours before / after class

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 is the first part of a survey of physics primarily for students in life sciences and non-science programs. It is suitable for students who require Physics 12 as a pre-requisite. Students explore kinematics, dynamics, work, energy and power, momentum, static equilibrium, thermal energy, fluids, circular motion and gravitation.

PREREQUISITE(S):

One of:

- C in Physics 11
- C in Camosun Alternative

And one of:

- C in Pre-calculus 11
- C in MATH 073
- C in MATH 077
- C in MATH 137
- C in MATH 139
- C in MATH 173
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CO-REQUISITE(S):

EQUIVALENCIES:

COURSE LEARNING OUTCOMES / OBJECTIVES

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

1. Perform addition, subtraction and scalar multiplication of vectors in two-dimensions using graphical and trigonometric techniques.
2. Solve technical problems involving kinematics and dynamics of particles in one- and two-dimensions.
 - a. Define and differentiate between kinematic variables (position, displacement, velocity, speed acceleration)
 - b. Solve technical kinematics problems involving constant acceleration in one-dimension (horizontal and inclined surfaces, and free fall) and two-dimensions (projectile motion).
 - c. Describe Newton's Laws and use Free-Body diagrams to represent forces acting on an object.
 - d. Apply Newton's Laws to solve dynamics problems involving gravitational forces, friction and interacting pairs of objects.
3. Apply conservation principles to solve technical problems involving energy and momentum
 - a. Solve problems involving the work done by constant forces in one-and two-dimensions using the work-kinetic energy theorem.
 - b. Use the conservation of energy principle to solve problems involving gravitational potential energy and dissipative forces.
 - c. Calculate power output and efficiency for simple mechanical systems
 - d. Apply the concepts of momentum and impulse to solve problems involving in collisions in one- and two-dimensions.
4. Apply kinematics and dynamics concepts to the study of circular, rotational and orbital motion
 - a. Use the concept of centripetal acceleration to solve dynamics problems involving objects in uniform circular motion.
 - b. Describe Newton's Law of Universal Gravitation and use this principle to solve problems involving orbital motion.
 - c. Evaluate the torque produced by a force and use the first and second condition for equilibrium to solve problems involving rigid objects in static equilibrium.
5. Solve technical problems involving elastic properties of solids and fluid statics and dynamics.
 - a. Define density, pressure (including gauge pressure), stress, strain and elastic modulus.
 - b. Characterize and evaluate the variation in pressure with depth in a fluid in hydrostatic equilibrium including applications of Pascal's Principle.
 - c. Apply Archimedes' principle to evaluate the buoyant force on objects partially or completely immersed in fluids.
 - d. Solve technical problems involving surface tension and capillary action.
 - e. Use the equation of continuity and Bernoulli's equation to qualitatively describe aspects and applications of fluids in motion.
6. Explore energy transfer by thermal mechanisms through investigations into heat exchange, thermal expansion and calorimetry.
 - a. Identify common temperature scales and appropriate conversion factors between scales.
 - b. Solve technical problems involving the thermal expansion of solids and fluids.

- c. Define and distinguish between the terms temperature, heat, thermal energy, specific heat capacity and latent heat.
 - d. Solve technical calorimetry problems including problems involving phase changes of matter.
 - e. Describe heat transfer by radiation, thermal conduction and convection.
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

Required materials:

- Physics 104 Lab Manual (2022 edition)
- 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>.)

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 or TOPIC	DUE DATES
WEEK #1		
Mon. Sep. 2 nd	No Class – Labour Day	
Tues. Sep. 3 rd	No Class – First Day of School.	
Weds. Sep. 4 th	Intro. Class / 1.1 Vector Operations (Graphical)	
Thurs. Sep. 5 th	1.1: Vector Operations (Graphical Approach)	
Fri. Sep. 6 th	1.2: Vector Components	
WEEK #2		
Mon. Sep. 9 th	1.3: Vector Operations (Component Method)	
Tues. Sep. 10 th	1.3: Vector Operations (Component Method)	
Weds. Sep. 11 th	Lab #1: Significant Figures, Scientific Notation, Unit Conversion (Oak Bay)	
Thurs. Sep. 12 th	2.1: Position, Distance and Displacement	
Fri. Sep. 13 th	2.2: Average and Instantaneous Velocity	HW #1 Due / Quiz #1
WEEK #3		
Mon. Sep. 16 th	2.3: Kinematics w/ Uniform Acceleration	
Tues. Sep. 17 th	2.4: Free-Fall	
Weds. Sep. 18 th	Lab #2: Mechanical Equilibrium in 2-D (Camosun)	Lab #1 Due
Thurs. Sep. 19 th	3.1: Kinematics in 2-D	
Fri. Sep. 20 th	3.1: Kinematics in 2-D	HW #2 Due / Quiz #2

WEEK	ACTIVITY or TOPIC	DUE DATES
WEEK #4		
Mon. Sep. 23 rd	No Classes – Pro-D Day	
Tues. Sep. 24 th	3.2: Projectile Motion	
Weds. Sep. 25 th	Test #1 (Oak Bay)	
Thurs. Sep. 26 th	3.2: Projectile Motion	
Fri. Sep. 27 th	4.1: Review of Forces	HW #3 Due / Quiz #3
WEEK #5		
Mon. Sep. 30 th	No Classes – National Day of Truth and Reconciliation	
Tues. Oct. 1 st	4.1: Review of Forces 4.2: Newton’s First Law	
Weds. Oct. 2 nd	Lab #3: Projectile Motion (Camosun)	Lab #2 Due
Thurs. Oct. 3 rd	4.3: Newton’s Second Law	
Fri. Oct. 4 th	4.4: Inclined Planes	HW #4 Due / Quiz #4
WEEK #6		
Mon. Oct. 7 th	4.5: Problems Involving Friction	
Tues. Oct. 8 th	4.6: Newton’s Third Law and Connected Objects	
Weds. Oct. 9 th	Lab #4: Deflection of a Loaded Beam (Camosun)	Lab #3 Due
Thurs. Oct. 10 th	4.6: Newton’s Third Law and Connected Objects	
Fri. Oct. 11 th	5.1: Kinematics of Uniform Circular Motion	HW #5 Due / Quiz #5
WEEK #7		
Mon. Oct. 14 th	No Class - Thanksgiving	
Tues. Oct. 15 th	5.2: Dynamics of Uniform Circular Motion	
Weds. Oct. 16 th	Lab #5: Centripetal Force (Camosun)	
Thurs., Oct. 17 th	5.2: Dynamics of Uniform Circular Motion	
Fri. Oct. 18 th	5.3: Newton’s Law of Universal Gravitation	HW #6 Due
WEEK #8		
Mon. Oct. 21 st	5.4: Gravity and Orbits	Quiz #6
Tues. Oct. 22 nd	6.1: Work	
Weds. Oct. 23 rd	Test #2	Lab #4 Due
Thurs., Oct. 24 th	6.2: The Work-Kinetic Energy Theorem	
Fri. Oct. 25 th	No Class – Pro D Day.	HW #7 Due / Quiz #7
WEEK #9		
Mon. Oct. 28 th	6.3: Potential Energy	
Tues. Oct. 29 th	6.4: Conservation of Energy	
Weds. Oct. 30 th	Lab #6: Uncertainties (Oak Bay)	Lab #5 Due
Thurs., Oct. 31 st	6.5: Conservation of Energy w/ NC Forces	
Fri. Nov. 1 st	7.1: Impulse and Momentum	HW #8 Due / Quiz #8
WEEK #10		
Mon. Nov. 4 th	7.1: Impulse and Momentum	
Tues. Nov. 5 th	7.2: Conservation of Momentum in 1-D	
Weds. Nov. 6 th	Lab #7: Work and Energy (Camosun)	
Thurs. Nov. 7 th	7.3: Conservation of Momentum in 2-D	
Fri. Nov. 8 th	8.1: Centre of Mass	HW #9 Due / Quiz #9

WEEK	ACTIVITY or TOPIC	DUE DATES
WEEK #11		
Mon. Nov. 11 th	No Classes – Remembrance Day	
Tues. Nov. 12 th	8.2: Torque 8.3: The Second Condition for Equilibrium	
Weds. Nov. 13 th	Test #3 (Oak Bay)	Lab #6 Due
Thurs. Nov. 14 th	8.3: The Second Condition for Equilibrium	
Fri. Nov. 15 th	8.4: Stress and Strain	HW #10 Due / Quiz #10
WEEK #12		
Mon. Nov. 18 th	9.1: Thermal Expansion	
Tues. Nov. 19 th	8.4: Stress and Strain	
Weds. Nov. 20 th	Lab #8: The Second Condition for Equilibrium (Camosun)	Lab #7 Due
Thurs. Nov. 21 st	10.1: Hydrostatic Equilibrium	
Fri. Nov. 22 nd	No Class Pro-D Day	HW #11 Due / Quiz #11
WEEK #13		
Mon. Nov. 25 th	10.2: Pascal's Principle / Gauge Pressure	
Tues. Nov. 26 th	10.3: Buoyancy and Archimedes' Principle	
Weds. Nov. 27 th	Test #4 (Oak Bay)	
Thurs. Nov. 28 th	10.3: Buoyancy and Archimedes' Principle	
Fri. Nov. 29 th	10.4: Capillary Effects / 10.5: Fluids in Motion	HW #12 Due / Quiz #12
WEEK #14		
Mon. Dec. 2 nd	10.5: Bernoulli's Principle	
Tues. Dec. 3 rd	9.1: Temperature, Internal Energy, Thermal Expansion	
Weds. Dec. 4 th	Lab #9: Buoyancy and Archimedes' Principle (Camosun)	Lab #8 Due
Thurs. Dec. 5 th	9.2: Heat / 9.3: Calorimetry Problems w/ no Phase Change	
Fri. Dec. 6 th	9.3: Calorimetry Problems w/ no Phase Change	HW #13 Due / Quiz #13
WEEK #15		
Mon. Dec. 9 th	9.4: Calorimetry Problems w/ Phase Change.	
Tues. Dec. 10 th	Review	
Weds. Dec. 11 th	Review	Lab #9 Due
Thurs. Dec. 12 th	Review	
Fri. Dec. 13 th	Final to be scheduled at some point this week	

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 notice is required. Deadlines can be reviewed on the [CAL exams page. https://camosun.ca/services/academic-supports/accessible-learning/academic-accommodations-exams](https://camosun.ca/services/academic-supports/accessible-learning/academic-accommodations-exams)

EVALUATION OF LEARNING

DESCRIPTION	WEIGHTING
Homework	5 %
Labs	25 %
Quizzes	15 %
Tests (Best 3 of 4)	25 %
Final Exam	30 %
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](#) policy for more information.

<https://camosun.ca/sites/default/files/2021-05/e-1.14.pdf>

COURSE GUIDELINES & EXPECTATIONS

Homework

Homework problems are designed to help you master problem solving skills and prepare you for the term tests. Homework will be checked during the term tests; full solutions will be posted online to allow you to check your work. Homework will be checked for completeness only and an overall grade will be assigned based on the fraction of the homework deemed to be complete.

Quizzes

Short, weekly quizzes will be delivered at the end of the lecture on the Friday of each week. Quizzes will be heavily based on the previous week's homework and are designed to give you quick formative feedback on your mastery of material.

Labs

Labs assigned in a particular week will be due by the end of the day (11:59 PM) on the Wednesday of the following week. Exceptions will apply in week when there are tests in which case, students will have an additional week to complete a lab that would otherwise be due on a test day.

Late Policies

Students requiring an extension to labs or homework due to illness or other extenuating circumstances must contact me prior to the due dates. Otherwise, late penalties will apply as noted. For overdue assignments, a late penalty of 10 % per day will be assessed.

All late assignments must be submitted by 11:59 PM on Friday December 13th ; after this point, outstanding assignments will receive a mark of zero. Students that miss a scheduled lab, quiz or test **must contact me within 24 hours of their absence** with a valid reason for their absence. Otherwise, a grade of zero will be applied to the missed item.

Study Habits

Physics 104 is a fast-paced, challenging course. You can anticipate spending at least 5 hours a week outside of class to master the material.

SCHOOL OR DEPARTMENTAL INFORMATION

PHYSICS DEPARTMENT GUIDELINES REGARDING LABS:

Laboratory activities involve practical applications of your knowledge and manual skills development. Development of these skills is a requirement to meet the Course Learning Outcomes.

- **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, a late penalty of 10% per day will be assessed following the due date.
- 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.

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>)

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. Holidays or scheduled flights are not considered to be emergencies.
- Missed exams normally receive a zero grade. Instructors are not required to provide make-up tests.

GENERAL IN-PERSON ASSESSMENT RULES FOR STUDENTS – PHYSICS AND ASTRONOMY DEPARTMENT:

The rules are used for on-campus quizzes, tests, and exams in the Physics and Astronomy department. A faculty member will actively supervise throughout the examination. The instructor may move around the room or sit at the front or back of the room. By entering the exam room, students agree to abide by the following rules:

- Turn off all electronic communication devices (including, but not limited to: cellphones, smartwatches, laptops, tablets) before entering and place them on a designated table at the front of the exam room.
- All bags, must be on the sides, back, or front of the room – the instructor will identify the appropriate place.
- Students are not permitted to wear brimmed hats or hoodies during in-person assessments.
- Students may bring pens, pencils, calculator, highlighters, erasers, ruler, protractor, and a drink in a closed container. If permitted in the room, students may have a snack in its original packaging or a clear container.
- Calculators must be scientific, non-textual calculators, with no notes of any kind in the case.
- Items brought into the room may be inspected by the faculty member.
- If you arrive late for the examination, no additional time will be provided. Students arriving more than 30 minutes late may not be allowed to enter the room.
- For biological breaks, permission to leave the exam room must be obtained. Only one student at a time may leave the room, and biological breaks must be as brief as possible.
- Access to any online materials during exams is prohibited.
- Any work submitted on an examination must be entirely your own.

Students found communicating with one another in any way or under any pretext; having unauthorized books, papers, electronic computing devices, data storage, or communication devices in view, even if their use is not proved; or found cheating in any way may receive a zero grade. All incidents will be recorded and managed according to the College's Academic Integrity Policy.

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.

