

# COURSE SYLLABUS



COURSE TITLE: PHYS-104: General College Physics 1

CLASS SECTION: B-03

TERM: W 2022

COURSE CREDITS: 4

DELIVERY METHOD(S):

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

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

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<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

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NAME: Elizabeth Ploughman

EMAIL: [ploughe@camosun.bc.ca](mailto:ploughe@camosun.bc.ca)

Phone : 250 370 3517

OFFICE:F 314B note that office hours will be held at a different location which will be announced when the term begins for Covid safety

HOURS:TBA

**In person at a location to be announced** . notice that 'office hours' will not be in my office as it is too small to be Covid-safe. phone questions can also occur but the time needs to be arranged as an appointment since I will not be by the phone during regular office hours. Mon and wed morning at 10 am are possible times for booked phone consultations

*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

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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

It is recommended that students who have been away from Physics for more than 5 years should first refresh with PHYS 070 or PHYS 101 or see the Physics chair to gauge skill level. It is also recommended that students who have been away from math courses for more than 5 years should consult with the Mathematics department to ensure that their math skills are at a level appropriate for this course.

**CO-REQUISITE(S):**

Not Applicable

**EXCLUSION(S):**

Not Applicable

## COURSE LEARNING OUTCOMES / OBJECTIVES

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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

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##### Required:

Calculator, paper, 2 duotangs or similar folders for submission of work, pens and pencils, ruler, protractor, graph paper, 'Physics 104 Workbook and supplement', physics 104 lab manual

##### Suggested:

'physics 104 home work pack', 'Physics' by Giancoli (any edition after the 4<sup>th</sup> will be useful)

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

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

WEEK or DATE RANGE	ACTIVITY or TOPIC	
1 <sup>st</sup> and 2 <sup>nd</sup> weeks	Theory of measurement, begin kinematics review	
3 <sup>rd</sup> and 4 <sup>th</sup> weeks	Kinematics, mostly in 1 dimension	
5 <sup>th</sup> week	Gravity and freefall	
6 <sup>th</sup> and 7 <sup>th</sup> weeks	force	
Week 8	Torque and inelastic collisions	
Week 9	Work and more on collisions	
Week 10	Energy and collisions which involve energy	
Week 11 and 12	Accelerated motion in 2 dimensions and heat introduced	
Week 13	Heat cont	
Week 14	review	

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](http://camosun.ca/services/accessible-learning/exams.html). <http://camosun.ca/services/accessible-learning/exams.html>

## EVALUATION OF LEARNING

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DESCRIPTION	WEIGHTING
<b>Lab reports</b> will be done at the start of the Tuesday class 1 week after the lab measurements are taken	20% in total

DESCRIPTION	WEIGHTING
<b>Tests</b> written in term time- 5 tests will be written ( approx.. 1 week after the topics : kinematics, force part 1, force part 2, energy and heat are completed) the precise dates will be announced through the term approx.. 1 week before each test is to be written. The student's worst (or missed) test will be dropped <b>See important note below re. tests!</b>	43% in total
Please note that the 'completion' of exercises will be signed off by the instructor in class ,please do not attempt to submit the home work cited below digitally	
Home work -Completion of exercises in the <b>workbook and supplement and any pretests handed out in class</b>	12%
2 hour <b>final exam</b> written in exam period	25%
<b>TOTAL</b>	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

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### attendance

This is NOT an in person course but students are expected to attend the 'lab' blocks that are on Tuesdays unless they are unwell.

**TESTS** will be written in the 'lab block' when there is a test and will be followed by lab work

**Tests are not 'open book'** you are **required to remember the formulas for unit tests** but not for the final exam. You will make an index card with any information you think will be helpful for the final exam

!!Your worst test will be dropped but there will be **no make up tests allowed except under exceptional circumstances** . [This is the reason that the worst test is dropped from you record](#)

**If more than 1 test is missed and no make up is written the additional weight will be divided equally between the final exam and the remaining tests.** Exact test dates will be announced as we complete the material but every test will always be approximately 1 week after the primary topic of the test is complete and you will always get at least 1 weeks notice . Announcements will be made in class and posted in the 'news' on D2L

**The final exam** must be written on the date assigned to it by administration. The only exception would be in accordance with the calendar regulations : if a student has an exam conflict (2 exams at the same time on the same day) the it is their responsibility to inform the instructor as soon as the conflict is discovered. In that case they will usually be given a time to write their exam with another

class that is writing an exam. In the case of documented illness a different but similar exam will be given after the student is recovered

Students will be allowed to bring the index card that they make during the review to the final exam

**Your lectures are asynchronous**. This means that you can watch and take notes any time after each is posted. See below for more detail. It is important, however, not to fall behind so the intent is that a student would work daily on their physics by watching lesson on the posting day and taking some notes, then attempting-using the included key if needed- the related practice problems in the workbook

## Submission of work

Only printed or hand written work will be accepted **no online marking will occur this term**. The home work from the workbook should be done in the workbook as far as possible and the completed sections (or the whole book) brought to lab periods to be checked for completion by the instructor. Lab reports and homework exercises that are not from the workbook must be submitted in class at the start of the next lab. All calculations must be done by hand in ink or erasable pen. (this is to reduce the temptation for partners to share calculations digitally)

## D2L, online lectures (more detail here)

New lectures will be posted into the contents of D2L on Mondays, Wednesdays, Thursdays and Fridays (except for holiday Mondays)

Most lessons will involve a **part A** (which focusses on theory with just 1 or 2 examples and has been recorded over this past summer) and a **part B** which will be recorded in the late afternoon or early evening (occasionally sooner) on the day it is posted. The total listening time (unless you scroll through at higher speed) will be approx.. 1 hour

**Your part Bs** will be examples of applications of the theory and will include explanations to questions that students have emailed me about the home work.

To watch these **asynchronous lessons** effectively you should take condensed notes from the part A videos - identify new symbols and equations and record them to index cards with enough explanation for your self to make the cards useful. When you watch the parts Bs you should make enough notes that you can refer to them while doing your homework and also compare your index cards against the examples that are shown on the screen

The index cards will be invaluable to you when you prepare the **index card that you will be allowed to bring into the final exam**

**Tutors** are provided in the physics help center, if you are having difficulties you may, of course, come to my office hours but you should also visit the tutors. They are invaluable but the continued presence is dependent upon students using the (free) service. So please do visit the tutors. Their schedule and location will be announced early in the term

**Email** Now that we are back in person for **office hours** and for the **lab block** Individual emails about hw etc. will not elicit an emailed individual response due to time constraints, neither will the instructor be available on evenings (except for your Tuesday class of course) and weekends

**BUT not withstanding the above** email questions are welcome but will be responded to in the posted example lectures each evening rather than separately to each individual. For instance, if I know from various emails that students are having a problem with some home work questions then I can devote some lecture time to the issue. If you still do not understand then you would need to visit my office hours or the tutors or both

**Labs Must be done during the assigned lab period**

A mark of below 50% for the lab average will lead to an automatic failing grade for the course

If a student misses and in class lab it can not be made up on campus but an alternate lab exercise will be given to the student to do at home so

If you are sick and miss a lab you will need to inform me and I will choose one of the home labs for you to do as a make up when you return. You will have extra time as needed to complete it and hand in your report

**grading of work** Formal reports for labs will be graded based on: format and appearance (2marks), technical (5 marks) discussion (3 marks)

Informal reports will be graded as explained each time an informal report is assigned

All homework keys are provided and students are required to check their work as they do it for method .

Individual questions are not marked in detail by the instructor but the assignment (whether in the workbook or a handout) is **graded for completion** and that includes whether you have compared your work to the given solution and asked for help if needed

## SCHOOL OR DEPARTMENTAL INFORMATION

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The Chair is Stephanie Ingraham

## STUDENT RESPONSIBILITY

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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

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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/>.

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Academic Advising

<http://camosun.ca/advising>

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Accessible Learning

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

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Counselling

<http://camosun.ca/counselling>

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

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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

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### 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](http://camosun.ca/sexual-violence). To contact the Office of Student Support: [oss@camosun.ca](mailto: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.