



CAMOSUN COLLEGE
School of Arts & Science
Department of Physics & Astronomy

PHYS-104-RDH04
General College Physics 1
Fall 2020

COURSE OUTLINE

The course description is available on the web @ <http://camosun.ca/learn/calendar/current/web/phys.html>

Ω Please note: This outline will not be kept indefinitely. It is recommended students keep this outline for their records, especially to assist in transfer credit to post-secondary institutions.

1. Instructor Information

(a) Instructor	Christopher Avis	
(b) Office hours	M: 9:00-10:00, Tu: 9:00-10:30, W: 9:00-10:00, Th: 9:00-11:20, F: 9:00-11:20	
(c) Location	Spectrum High School / D2L	
(d) Phone	N/A (Please email)	Alternative: _____
(e) E-mail	avisc@camosun.bc.ca	
(f) Website	online.camosun.ca	

2. Intended Learning Outcomes

(If any changes are made to this part, then the Approved Course Description must also be changed and sent through the approval process.)

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 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, records, 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.

3. Required Materials

(a) Texts

Physics by Giancoli, 5th Edition or later (optional and available from Mr. Lilyholm)

Physics 104 Laboratory Manual

(b) Other

Ruler, protractor, scientific calculator. Access to a computer, tablet, cellphone or other device with internet access and the ability to stream videos.

4. Course Content and Schedule

This course is being delivered as a hybrid between Camosun's Physics 104 and BC High School Physics 12 during Spectrum's first quarter. Students will complete Physics 104 during the first 7 weeks of the course; the last two weeks of the term will be devoted to additional Physics 12 content.

The course will be delivered using a flipped classroom model. Students will be expected to watch lecture videos at home on their own time. In class time will be used for students to work on homework problems and labs as well as for delivery of quizzes and tests.

Classes will occur Monday through Friday from 9:00 AM – 11:20 AM for the first 5 weeks of the term. In the latter weeks of the term, the course will pivot to a physically distanced cross-learning group model. Details on the delivery of the latter half of the course will be provided closer to the transition time.

Class times (First 5 weeks):

Monday – Friday: 9:00 AM – 11:20 AM
 Thursday: 3:15 PM – 4:45 PM

Spectrum High School
 Spectrum High School

5. Basis of Student Assessment (Weighting)

- (a) Homework: 15%
- (b) Quizzes: 15%
- (c) Labs: 30 %
- (d) Tests: 40 % (Four term tests, each worth 10%)

Note the following expectations around assessments:

- Homework will be due by the end of class on the Monday following the week in which they were assigned. Labs will be due by the end of class on the Wednesday following the week in which they were assigned. Late homework and labs will be subject to a 10% per day mark deduction up to a maximum of 50% mark reduction.
- All outstanding homework and labs must be received by the end of the day on Monday November 2nd (the start of the Physics 12 portion of the course).
- Quizzes will be delivered during class time twice a week. These will consist of one or two short questions very similar to lecture and homework problems and are designed to encourage students to keep pace with the material.
- 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.
- Per physics department guidelines, students must obtain an overall grade of 50% or higher in the laboratory component of the course order to obtain credit for the course.
- Students in this course are subject to the Camosun College Arts & Science Academic Honesty Guidelines. Students are encouraged to familiarize themselves with the guidelines and consult the instructor if they have any questions:

<http://camosun.ca/learn/school/arts-science/images/Arts%20and%20Science%20Academic%20Honesty%20Guidelines.pdf>

6. Grading System

(If any changes are made to this part, then the Approved Course description must also be changed and sent through the approval process.)

(Mark with "X" in box below to show appropriate approved grading system – see last page of this template.)

Standard Grading System (GPA)

Competency Based Grading System

7. Recommended Materials to Assist Students to Succeed Throughout the Course

8. College Supports, Services and Policies



Immediate, Urgent, or Emergency Support

If you or someone you know requires immediate, urgent, or emergency support (e.g. illness, injury, thoughts of suicide, sexual assault, etc.), **SEEK HELP**. Resource contacts @

<http://camosun.ca/about/mental-health/emergency.html> or <http://camosun.ca/services/sexual-violence/get-support.html#urgent>

College Services

Camosun offers a variety of health and academic support services, including counselling, dental, disability resource centre, help centre, learning skills, sexual violence support & education, library, and writing centre. For more information on each of these services, visit the **STUDENT SERVICES** link on the College website at <http://camosun.ca/>

College Policies

Camosun strives to provide clear, transparent, and easily accessible policies that exemplify the college's commitment to life-changing learning. It is the student's responsibility to become familiar with the content of College policies. Policies are available on the College website at <http://camosun.ca/about/policies/>. Education and academic policies include, but are not limited to, Academic Progress, Admission, Course Withdrawals, Standards for Awarding Credentials, Involuntary Health and Safety Leave of Absence, Prior Learning Assessment, Medical/Compassionate Withdrawal, Sexual Violence and Misconduct, Student Ancillary Fees, Student Appeals, Student Conduct, and Student Penalties and Fines.

A. GRADING SYSTEMS <http://camosun.ca/about/policies/index.html>

The following two grading systems are used at Camosun College:

1. Standard Grading System (GPA)

Percentage	Grade	Description	Grade Point Equivalency
90-100	A+		9
85-89	A		8
80-84	A-		7
77-79	B+		6
73-76	B		5
70-72	B-		4
65-69	C+		3
60-64	C		2
50-59	D		1
0-49	F	Minimum level has not been achieved.	0

2. Competency Based Grading System (Non GPA)

This grading system is based on satisfactory acquisition of defined skills or successful completion of the course learning outcomes

Grade	Description
COM	The student has met the goals, criteria, or competencies established for this course, practicum or field placement.
DST	The student has met and exceeded, above and beyond expectation, the goals, criteria, or competencies established for this course, practicum or field placement.
NC	The student has not met the goals, criteria or competencies established for this course, practicum or field placement.

B. Temporary Grades

Temporary grades are assigned for specific circumstances and will convert to a final grade according to the grading scheme being used in the course. See Grading Policy at <http://camosun.ca/about/policies/index.html> for information on conversion to final grades, and for additional information on student record and transcript notations.

Temporary Grade	Description
I	<i>Incomplete:</i> A temporary grade assigned when the requirements of a course have not yet been completed due to hardship or extenuating circumstances, such as illness or death in the family.
IP	<i>In progress:</i> A temporary grade assigned for courses that are designed to have an anticipated enrollment that extends beyond one term. No more than two IP grades will be assigned for the same course.
CW	<i>Compulsory Withdrawal:</i> A temporary grade assigned by a Dean when an instructor, after documenting the prescriptive strategies applied and consulting with peers, deems that a student is unsafe to self or others and must be removed from the lab, practicum, worksite, or field placement.