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

PHYS-104-002
General College Physics 1
Winter 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	Stephanie Ingraham		
(b) Office hours	Mon, Tues, Thurs: 11:30 am -12:20 pm, Wed: 1:30- 2:20 pm, Fri: 12:30-1:20 pm (or by appointment)		
(c) Location	F346C		
(d) Phone	250-370-3513	**Alternative:**	
(e) E-mail	IngrahamS@camosun.bc.ca		
(f) Website	D2L (online.camosun.ca)		

2. Intended Learning Outcomes

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

1. Solve technical problems involving one-dimensional kinematics for a single particle undergoing constant acceleration along horizontal and inclined surfaces, and in free fall.
2. Solve technical problems involving the dynamics of a single particle in one dimension, the vector nature of forces, the net force on an object, free-body diagrams for single and two interacting objects, gravitational forces, and inertia.
3. Solve technical problems involving kinetic energy, gravitational potential energy, elastic potential energy, conservation of mechanical energy, and mechanical power, in one dimension.
4. Solve technical problems involving conversions between common temperature scales, specific heat capacity, latent heats, calorimetry, and heat transfer by radiation, thermal conduction and convection.
5. Solve technical problems involving nuclear energy (mass-energy equivalence, binding energy), demonstrate knowledge of nuclear fission, fusion, and fuel disposal problems.
6. Solve elementary technical problems involving graphical and trigonometric vector algebra in two dimensions, two-dimensional kinematics (motion), dynamics (forces), work and power.
7. Solve technical problems involving projectile motion, circular motion with constant speed, gravitational forces and planetary motion.
8. Solve technical problems involving hydrostatics (Archimedes' principle, Pascal's principle) and simple fluids in motion (Equation of continuity, Bernoulli's equation).
9. Assemble experimental apparatus using written instructions.
10. Observe, record, organize and display data in tables, graphs or charts.
11. Analyze linear graphs (determine area, slope, intercept, etc.).
12. Observe and record sources of error and estimate the range of uncertainty in results.
13. Interpret meaning of experimental results in the context of the experimental objectives.
14. Write scientific reports in an acceptable, traditional format.

3. Required Materials

(a) Texts
Physics by Giancoli, 7th Edition (optional- homework will be assigned from the textbook, but there are reserved copies available in Camosun library)

Physics 104 Laboratory Manual

(b) Other
Ruler, protractor, scientific calculator.

4. Course Content and Schedule

Lab:	Wednesday	11:30 am - 1:20 pm	F322
Lectures:	Mon, Tues, Thurs	12:30 - 1:20 pm	F322
	Friday	9:30- 10:20 am	F316

Tests will be held in the lab period on January 29th, February 26th, March 11th, and April 1st.

5. Basis of Student Assessment (Weighting)

(a)	Homework Assignments	5 %
(b)	Labs	25 %
(c)	Term Tests (Best 3 of 4)	30 %
(d)	Final Exam	40 %

COURSE SPECIFIC POLICIES

- Homework problems for a particular week will be assigned from the textbook and marked for completeness. They will be due at the **beginning of class** on the Friday of each week.
- Labs for a particular week will be due by the beginning of the lab one week following the lab. Any changes in due dates or timelines will be posted on the D2L news feed.
- Each student is allowed one “dropped” or “missed” lab.

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 homework or labs must be submitted prior to the last day of classes, and will be graded according to the late policy outlined by the instructor.

- Refer to your instructor's information page for any additional policies regarding testing and grade calculation.

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.

- Students will complete a minimum of 9 laboratory experiments including 3 formal reports (with full uncertainty calculations) and at least at least one lab using technology to perform data analysis.

6. Grading System

[X] 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	*Incomplete*: 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	*In progress*: 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	*Compulsory Withdrawal*: 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.

Tentative Class Schedule

Note that the lecture topics may vary by one or two days. Any changes to scheduled labs will be posted on D2L.

Date	**Lecture Topic: P104-002**
WEEK #1	

Monday, Jan. 6th	Introduction / 1.1 – Measurements, Units and the SI System
Tuesday, Jan. 7th	1.2 Scientific Notation
Wednesday, Jan. 8th	LAB 1 – Data Analysis and Graphing (Informal)
Thursday, Jan. 9th	1.3 Unit Conversions
Friday, Jan. 10th	1.3 – Unit Conversions/ Uncertainty
WEEK #2	
Monday, Jan. 13th	2.1: Vectors and Scalars / Position and Displacement
Tuesday, Jan. 14th	2.2: Speed and Velocity
Wednesday, Jan. 15th	LAB 2 – Error and Precision Measurement (Exercise) & Uncertainty Intro
Thursday, Jan. 16th	2.3: Average and Instantaneous Acceleration
Friday, Jan. 17th	2.4: 1-D Kinematics Problems
WEEK #3	
Monday, Jan. 20th	2.5 – Applications to Vertical Motion
Tuesday, Jan. 21st	3.1 – Vector Operations
Wednesday, Jan. 22nd	LAB 3– Kinematics in 1D (Formal)
Thursday, Jan. 23rd	3.2 – Vector Components
Friday, Jan. 24th	3.3 – Vector Operations with Components
WEEK #4	
Monday, Jan. 27th	3.3 – Vector Operations with Components3
Tuesday, Jan. 28th	3.4 – Kinematics in 2-D
Wednesday, Jan. 29th	TEST 1- Measurement and Kinematics in 1D
Thursday, Jan. 30th	3.5 – Projectile Motion
Friday, Jan. 31st	3.5 – Projectile Motion / 4.1 – Review of Forces
WEEK #5	
Monday, Feb. 3rd	4.1 – Review of Forces / 4.2 – Objects subject to N1L
Tuesday, Feb. 4th	4.2 – Objects Subject to N1L
Wednesday, Feb. 5th	LAB 4 –Velocity in 2D (Informal)
Thursday, Feb. 6th	4.3 – Objects Subject to N2L
Friday, Feb. 7th	4.3 – Objects Subject to N2L
WEEK #6	
Monday, Feb. 10th	4.4 – Problems involving Friction
Tuesday, Feb. 11th	4.5 – Situations involving Inclined Planes
Wednesday, Feb. 12th	LAB 5 – Mechanical Equilibrium (Informal)
Thursday, Feb. 13th	4.6 – N3L and Connected Objects
Friday, Feb. 14th	5.1 – Kinematics of Uniform Circular Motion
WEEK #7	
Monday, Feb. 17th	No Class- Family Day
Tuesday, Feb. 18th	Reading Break
Wednesday, Feb. 19th	Reading Break
Thursday, Feb. 20th	Reading Break
Friday, Feb. 21st	Reading Break
WEEK #8	
Monday, Feb. 24th	5.2 – Dynamics of Uniform Circular Motion
Tuesday, Feb. 25th	5.2 – Dynamics of Uniform Circular Motion / 5.3 –Unbanked Curves
Wednesday, Feb. 26th	TEST #2- 2D Kinematics and Dynamics
Thursday, Feb. 27th	5.4 – Newton's Law of Universal Gravitation
Friday, Feb. 28th	5.5 – Gravity and Orbits
WEEK #9	
Monday, Mar. 2nd	5.5 – Gravity and Orbits
Tuesday, Mar. 3rd	6.1: Work
Wednesday, Mar. 4th	LAB 6 – Atwood's Machine (Formal)

Thursday, Mar. 5th	6.2 – The Work-Kinetic Energy Theorem
Friday, Mar. 6th	6.3 – Potential Energy
WEEK #10	
Monday, Mar. 9th	6.3 – Potential Energy / 6.4 – Conservation of Energy
Tuesday, Mar. 10th	6.4 – Conservation of Energy
Wednesday, Mar. 11th	Test #3- Inclined planes, connected objects, Uniform Circular Motion
Thursday, Mar. 12th	6.5 – Conservation of Energy with Non-Conservative Forces
Friday, Mar. 13th	6.6 - Power
WEEK #11	
Monday, Mar. 16th	7.1 – Temperature and Thermometers, 7.2 – Thermal Expansion
Tuesday, Mar. 17th	7.3 – Heat and Thermal Energy
Wednesday, Mar. 18th	LAB 7 –Centripetal Force (Informal)
Thursday, Mar. 19th	7.4 – Calorimetry Problems with No Phase Change
Friday, Mar. 20th	7.5 – Calorimetry Problems with Phase Change
WEEK #12	
Monday, Mar. 23rd	7.5 – Calorimetry Problems with Phase Change / 7.6 – Mechanisms of Heat Transfer
Tuesday, Mar. 24th	8.1 – Density and Pressure
Wednesday, Mar. 25th	Lab 8- Latent Heat of Fusion of Water (Formal)
Thursday, Mar. 26th	8.2 – Solving Hydrostatics Problems
Friday, Mar. 27th	8.2 – Solving Hydrostatics Problems / 8.3 – Pascal's Principle
WEEK #13	
Monday, Mar. 30th	8.4 – Buoyancy and Archimedes' Principle
Tuesday, Mar. 31st	8.4 – Buoyancy and Archimedes' Principle / The Equation of Continuity
Wednesday, April 1st	Test #4- Work-Energy and Thermal Energy
Thursday, April 2nd	8.5 – The Equation of Continuity and Bernoulli's Equation
Friday, April 3rd	9.2 – The Mass Defect and Binding Energy
WEEK #14	
Monday, April 6th	9.3 – Radioactivity; Alpha, Beta and Gamma Decay
Tuesday, April 7th	9.5 – Fission and Fusion; 9.6 – Nuclear Reactors
Wednesday, April 8th	Lab 9- Archimedes' Principle (Informal)
Thursday, April 9th	Exam Review
Friday, April 10th	No Class