CAMOSUN COLLEGE	**School of Arts & Science** **PHYSICS DEPARTMENT** **PHYS 104 - 002** **General College Physics 1** **Winter 2017**

COURSE OUTLINE

The course description is online @ http://camosun.ca/learn/calendar/current/web/phys.html

Ω *Please note: the College electronically stores this outline for five (5) years only.*
*It is **strongly recommended** you keep a copy of this outline with your academic records.*
You will need this outline for any future application/s for transfer credit/s to other colleges/universities.

1. Instructor Information

(a)	Instructor:	Stephanie LaForest
(b)	Office Hours:	Mon, Wed, Thurs: 1:30-2:20pm, Tues: 2:30-3:20pm, Fri: 11:30-12:20pm
(c)	Location:	F346C
(d)	Phone:	250-370-3513
(e)	Email:	laforests@camosun.bc.ca
(f)	Website:	D2L (online.camosun.ca)

2. Intended Learning Outcomes

(No changes are to be made to these Intended Learning Outcomes as approved by the Education Council of Camosun College.)

Upon completion of this course the 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: Principles with Applications, 7th Edition. Douglas C. Giancoli. Pearson 2014.
Physics 104 Laboratory Manual

(b) Other: Scientific calculator (No graphing calculators or cellphones!)
Ruler, graph paper.

4. Course Content and Schedule

Class Times:	Monday	12:30 – 1:20 pm F316
	Wednesday	12:30 - 1:20 pm F316
	Thursday	12:30 – 1:20 pm F316
	Friday	12:30 – 1:20 pm F316
Lab Time:	Tuesday	11:30 – 1:20 pm F316

5. Basis of Student Assessment (Weighting)

The student must be successful in both the theory and laboratory assignments to pass the course. The approximate percentages used for the final grading are:

(a) Homework: 5%
(b) Labs: 15 %
(c) Midterm Tests (best 3 out of 4): 30%
(d) Final Exam: 50 %

COURSE SPECIFIC POLICIES

1. Homework problems will be assigned from the textbook. They will be due each week and will be marked for completeness.

2. Labs for a particular week will be due one week following the lab. Each student is allowed one "dropped" or "missed" lab.

3. You must be present to collect your own data during a lab (as will be verified with a sign in sheet). Labs completed using others' data will not be accepted.

4. 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.

PHYSICS DEPARTMENT POLICIES REGARDING TESTING:

1. The final exam will cover the entire course and will be 3 hours long. As stated in the current college calendar on page 39, "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.

2. 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, if they are notified within 24 hours of the missed test.

PHYSICS DEPARTMENT POLICIES REGARDING LABS:

1. Labs take place in the designated 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. In the case that a makeup lab is required, the instructor must be contacted by phone or email within 24 hours of the missed lab.

2. 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 lab report is still required and earns a maximum mark of 50%.

3. At the discretion of the instructor, a student who is repeating this Physics course may apply for lab exemption.

6. Grading System

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	Minimum level of achievement for which credit is granted; a course with a "D" grade cannot be used as a prerequisite.	1
0-49	F	Minimum level has not been achieved.	0

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 E-1.5 at **camosun.ca** 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, due to design may require a further enrollment in the same course. No more than two IP grades will be assigned for the same course. *(For these courses a final grade will be assigned to either the 3rd course attempt or at the point of course completion.)*
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.

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

STUDY TIME
It is recommended that between 5 and 10 hours per week (or more for students with a weak background) be spent studying for this course outside of class time.

LEARNING SUPPORT AND SERVICES FOR STUDENTS

There are a variety of services available for students to assist them throughout their learning. This information is available in the College calendar, at Student Services, or the College web site at camosun.ca.

STUDENT CONDUCT POLICY

There is a Student Conduct Policy **which includes plagiarism**.
It is the student's responsibility to become familiar with the content of this policy.
The policy is available in each School Administration Office, at Student Services, and the College web site in the Policy Section.

OUTLINE:

1. **Measurement and Units – REVIEW**

2. **Kinematics in one dimension - REVIEW**

    2.1 Displacement
    2.2 Average and instantaneous velocity
    2.3 Average and instantaneous acceleration
    2.4 Equations of uniformly-accelerated motion
    2.5 Application to falling bodies
    2.6 *OPTIONAL: Review of kinematic graphs*

3. **Kinematics and Vectors in two dimensions**

    3.1 Graphical representation of vector algebra
    3.2 Vector algebra by trigonometry
    3.3 Kinematics in two dimensions
    3.4 Projectile motion
    3.5 *OPTIONAL; Max. height and Range eq'ns*

4. **Dynamics**
    4.1 Introduction to Newton's Laws of Motion
    4.2 Mass and Weight
    4.3 Types of forces (gravitational, contact, tension; friction)
    4.4 Free body diagrams. Concept of net force
    4.5 Dynamics in two dimensions; simultaneous forces, inclines
    4.6 *OPTIONAL: Connected objects.*

5. **Uniform circular motion and gravitation**

    5.1 Kinematics and dynamics of uniform circular motion
    5.2 Newton's Universal law of gravitation
    5.3 Application to circular planetary motion; satellites.
    5.4 *OPTIONAL: Kepler's laws (5.9)*

6. **Work, energy and power**

    6.1 Work done by a constant force. Net work
    6.2 Kinetic energy. The Work-Energy Principle
    6.3 Potential energy (gravitational, spring)
    6.4 Conservative and Nonconservative forces
    6.5 Work and Energy in two dimensions and with dissipative forces.
    6.6 Conservation of mechanical energy
    6.7 Energy conservation with dissipative forces
    6.8 Power and efficiency

7. **Thermal energy**

- 7.1 Temperature and thermometers
- 7.2 Thermal expansion
- 7.3 Heat as a form of energy; specific heat
- 7.4 Change of state and latent heat; calorimetry
- 7.5 Heat transfer: conduction, convection and radiation
- 7.6 *OPTIONAL: Heat Transfer Applications.*

8. **Fluids**

- 8.1 Pressure; fluid statics and density
- 8.2 Pascal's Principle
- 8.3 Archimedes' Principle and buoyancy
- 8.4 Fluids in motion; Equation of continuity
- 8.5 *OPTIONAL: Bernoulli's Principle and applications.*

9. **Nuclear energy**

- 9.1 Structure and properties of nucleus
- 9.2 Binding energy
- 9.3 α, β, γ decay processes
- 9.4 *OPTIONAL: Radioactivity, Concept of half-life*
- 9.5 Nuclear Energy; The chain reaction; Applications
- 9.6 Nuclear waste; disposal and reprocessing.
- 9.7 Fusion energy; Applications (energy-production in stars)
- 9.8 *OPTIONAL: Radiation damage in matter*