CAMOSUN COLLEGE	***School of Arts & Science*** ***PHYSICS DEPARTMENT*** **PHYS 104 - 002** **General College Physics 1** **Fall 2013**

COURSE OUTLINE

The Approved Course Description is available on the web @
http://camosun.ca/learn/calendar/current/web/phys.html

Ω *Please note: this outline will be electronically stored for five (5) years only.*
It is strongly recommended students keep this outline for your records.

1. Instructor Information

Instructor:	Nancy Luick
Office Hours:	Mon., Wed., Thurs: 10:30 – 11:20 am & Wed., Thurs 12:30-1:30 pm or by appointment
Location:	F346B
Phone:	370 - 3515
Email:	luick@camosun.bc.ca
Website Info:	http://luick.disted.camosun.bc.ca

2. Intended Learning Outcomes

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 simple 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. Interpret meaning of experimental results in the context of the experimental objectives.

3. Required Materials

(a) Texts Physics, Principles with Applications, *7th edition*, Douglas C. Giancoli
(b) Other Physics 104 Laboratory Manual
Graph paper (must be either 10 lines/inch or millimeter graph paper)

4. Course Content and Schedule

Class Times:	Mon., Tues., Wed., Thurs	1:30 – 2:20 pm	F322
Lab Times:	Tuesday	10:30 – 12:20 pm	F316

5. Basis of Student Assessment (Weighting)

The student must be successful (≥ 60%) in both the theory and laboratory assignments to pass the course. The approximate percentages used for the final grading are:

Tests/Homework	35%**
Lab Work	15%
Final Exam (3 hours)	50%

**Refer to your instructor's information page on website for any additional comments regarding testing and grade calculation.

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.

3. **Refer to your instructor's information page on website for any additional policies regarding testing and grade calculation.

PHYSICS DEPARTMENT POLICIES REGARDING LABS & ASSIGNMENTS:

1. All assigned laboratory exercises and reports must be satisfactorily completed and handed in prior to the date of the final exam with an overall grade of 60% in order to obtain credit for the course.

2. 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.

3. 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%. Late assignments will not be accepted after solutions have been posted to website – normally 2 or 3 working days after due date.

4. 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

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 on the College web site in the Policy Section.www.camosun.bc.ca/divisions/pres/policy/2-education/2-5.html

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. **Dynamics in one dimension - REVIEW**

    3.1 Introduction to Newton's Laws of Motion
    3.2 Mass and Weight
    3.3 Types of forces (gravitational, contact, tension; friction
    3.4 Free body diagrams. Concept of net force

4. **Work, energy and power - omit inclines**

    4.1 Work done by a constant force. Net work
    4.2 Kinetic energy. The Work-Energy Principle
    4.3 Potential energy (gravitational, spring)
    4.4 Conservative and Nonconservative forces
    4.5 Conservation of mechanical energy
    4.6 Energy conservation with dissipative forces
    4.7 Power and efficiency

5. **Thermal energy**

    5.1 Temperature and thermometers
    5.2 Thermal expansion
    5.3 Heat as a form of energy; specific heat
    5.4 Change of state and latent heat; calorimetry
    5.5 Heat transfer: conduction, convection and radiation
    5.6 *OPTIONAL: Heat Transfer Applications.*

6. **Nuclear energy**

    6.1 Structure and properties of nucleus
    6.2 Binding energy
    6.3 α, β, γ decay processes
    6.4 *OPTIONAL: Radioactivity, Concept of half-life – qualitative*
    6.5 Nuclear Energy; The chain reaction; Applications
    6.6 Nuclear waste; disposal and reprocessing.
    6.7 Fusion energy; Applications (energy-production in stars)
    6.8 *OPTIONAL: Radiation damage in matter*

7. **Kinematics and Dynamics Vectors in two dimensions and Work & Energy re-visited**

7.1 Graphical representation of vector algebra
7.2 Vector algebra by trigonometry
7.3 Kinematics in two dimensions
7.4 Projectile motion (*OPTIONAL; Max. height and Range eq'ns.)*
7.5 Dynamics in two dimensions; simultaneous forces, inclines *(OPTIONAL: Connected objects.)*
7.6 Review of Work and Energy in two dimensions and with dissipative forces.

8. **Uniform circular motion and gravitation**

8.1 Kinematics and dynamics of uniform circular motion
8.2 Newton's Universal law of gravitation
8.3 Application to circular planetary motion; satellites.
8.4 *OPTIONAL: Kepler's laws*

9. **Fluids**

9.1 Pressure; fluid statics and density
9.2 Pascal's Principle
9.3 Archimede's Principle and buoyancy
9.4 Fluids in motion; Equation of continuity
9.5 *OPTIONAL: Bernoulli's Principle and applications.*