



School of Arts & Science
PHYSICS DEPARTMENT
PHYS 104-003
General College Physics 1
2007W

COURSE OUTLINE

The Approved Course Description is available on the web @ _____

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

(a)	Instructor:	Alf Wilson		
(b)	Office Hours:	Inter (TEC220): Tuesday 8:30-9:20am Lans (F346C): W and F 12:30-13:20 (tentative) I am usually available at other times – drop by!		
(c)	Location:	Inter: TEC 220 Lans: F346C		
(d)	Phone:	Inter: 370-4437		
		Lans: 370-3513		
(e)	Email:	wilsona@camosun.bc.ca		
(f)	Website:	www.draif.ca		

2. Intended Learning Outcomes

(No changes are to be made to this section, unless the Approved Course Description has been forwarded through EDCO for approval.)

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).

3. Required Materials

(a)	Texts	Physics, Principles with Applications, 6 th edition, Douglas C. Giancoli
(b)	Other	Physics 104/105 Lab Manual

4. Course Content and Schedule

Content (Chapters in Giancoli's textbook)

1. **Measurement and Units – REVIEW (Ch. 1 - all)**
2. **Kinematics in one dimension - REVIEW (Ch. 2 - all)**
 - 2.1 Displacement
 - 2.2 Review of kinematics graphs
 - 2.3 Average and instantaneous velocity
 - 2.4 Average and instantaneous acceleration
 - 2.5 Equations of uniformly-accelerated motion
 - 2.6 Application to falling bodies
3. **Kinematics in two dimensions (Ch. 3 - all)**
 - 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 Dynamics in two dimensions; simultaneous forces, inclines
4. **Dynamics in Two Dimensions (Ch. 4 – all)**
 - 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
5. **Uniform circular motion and gravitation (Ch. 5.1 – 5.3, 5.6 – 5.8)**
 - 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 (Ch. 6.1, 6.3 - 6.10)**
 - 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 Conservation of mechanical energy
 - 6.6 Energy conservation with dissipative forces
 - 6.7 Power and efficiency
7. **Thermal energy (Ch. 13.2, 13.4 and Ch. 14 - all)**
 - 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. **Nuclear energy (Ch. 30.1 – 30.8) and (Ch. 31.1 – 31.4)**

8.1 Structure and properties of nucleus

8.2 Binding energy

8.3 α , β , γ decay processes

8.4 *OPTIONAL: Radioactivity, Concept of half-life (30.3, 30.8 – qualitative)*

8.5 Nuclear Energy; The chain reaction; Applications

8.6 Nuclear waste; disposal and reprocessing.

8.7 Fusion energy; Applications (energy-production in stars)

8.8 *OPTIONAL: Radiation damage in matter (31.4)*

9. **Fluids (Ch. 10.1 – 10.8)**

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. (10.9, 10.10)*

Schedule:

Class Times: M, W, Th, F	13:30 - 14:20 am	F 316
Lab Time: Tuesday	13:30 - 15:20 pm	F 316

5. **Basis of Student Assessment (Weighting)**

(Should be linked directly to learning outcomes.)

(a)	Assignments	N/A
(b)	Term Tests	35%
(c)	Exams	50%
(d)	Labs*	15%

*see Physics Department Policies regarding labs later in this document: Failure to complete **all** labs results in an **F**.

6. **Grading System**

(No changes are to be made to this section, unless the Approved Course Description has been forwarded through EDCO for approval.)

Standard Grading System (GPA)

Percentage	Grade	Description	Grade Point Equivalency
95-100	A+		9
90-94	A		8
85-89	A-		7
80-84	B+		6
75-79	B		5
70-74	B-		4
65-69	C+		3
60-64	C		2
50-59	D		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 at camosun.ca or 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.

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.

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

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.

Department Policies Regarding Testing and Labs

- (a) Students must write review-quizzes, midterm-tests, etc. on the date and time assigned by the instructor. Instructors are not required to provide make-up tests. At their discretion, instructors may waive a test or provide a make-up test only in the event of documented illness or other extenuating circumstances.
- (b) **All assigned laboratory exercises must be completed with an overall grade of 60% or better to obtain credit for this course.** A lab may be waived or made up at a later time only in the case of documented illness or other extenuating circumstances.
- (c) A student who is repeating an Astronomy course does not have to complete the laboratory exercises a second time if an average lab grade of 70% or better was obtained.