



School of Arts & Science
PHYSICS DEPARTMENT
PHYS 104-01
General College Physics 1
2006F

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: | Elizabeth Ploughman | | |
| (b) | Office Hours: | Mon, Wed, Fri. 12:30-1:20 Tues.. 1:30 –2:20 Thurs. 5:30 -6:20 | | |
| (c) | Location: | F 314B | | |
| (d) | Phone: | 370 3517 please DO leave a voicemail message it will be received and responded to promptly | Alternative Phone: | |
| (e) | Email: | | | |
| (f) | Website: | | | |

DO Not leave email messages as they will not be received until I check my emails from my office. Let me repeat that, important info. is to be left in my voicemail which I check throughout the day.

If you wish to see me at other times you are free to knock on my office door, if I'm not too busy I will be happy to assist you. If you know in advance that you will need help at a non official time then see me to make an appointment.

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 Physics 104/105 lab manual |
| (b) | Other | Scientific calculator (any calculator is acceptable excluding personal computers) Graph paper (must be either 10 lines/inch or millimeter graph paper) |

4. Course Content and Schedule

(Can include: class hours, lab hours, out of class requirements and/or dates for quizzes, exams, lectures, labs, seminars, practicums, etc.)

CREDIT: 4
 IN-CLASS WORKLOAD: 4 lecture, 2 lab (Semester)
 PRE-/CO-REQUISITES: Physics 11 **or** PHYS 060 **or** PHYS 150 **or** departmental assessment, **and** one of: Math 063, Math 173; **or** Math 11 **or** assessment

OUTLINE:

1. **Measurement and Units – REVIEW (Ch. 1.1 – 1.7)**
2. **Kinematics in one dimension - REVIEW (Ch. 2)**
 - 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 (2.8)*
3. **Dynamics in one dimension - REVIEW (Ch. 4.1 - 4.6)**
 - 3.1 Introduction to Newton's Laws of Motion
 - 3.2 Mass and Weight
 - 3.3 Types of forces (gravitational, contact, tension; friction (def'n in 4.8))
 - 3.4 Free body diagrams. Concept of net force
4. **Work, energy and power (Ch. 6.1, 6.3 - 6.10, 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 (Ch. 13.2, 13.4) and (Ch. 14)**
- 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 (Ch. 30.1 – 30.8) and (Ch. 31.1 – 31.4)**
- 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 (30.3, 30.8 – 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 (31.4)*
7. **Kinematics and Dynamics Vectors in two dimensions (Ch. 3.1 – 3.6) and (Ch. 4.7, 4.8 and Ch. 6 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 (Ch. 5.1 – 5.3, 5.6 – 5.9)**
- 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 (5.9)*
9. **Fluids (Ch. 10.1 – 10.10)**
- 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
- OPTIONAL: Bernoulli's Principle and applications. (10.9, 10.10)*

5. Basis of Student Assessment (Weighting)
(Should be linked directly to learning outcomes.)

Final Exam

50%

| | |
|-------------------------|------|
| Midterms | 35% |
| Lab Reports/Assignments | 15% |
| | 100% |

This distribution may be amended by the instructor (see your Instructor's Information sheet).

A)Tests will be chapter tests for all classes. At least 5 days notice will be given for each test and a brief review will be conducted.

The worst test will be dropped to allow for the fact **that no makeup tests** will be given unless medical documentation is provided by the student

B)LABS the worst lab will be dropped but all other labs must be completed. Makeup labs are not usually allowed unless there is a documented medical reason. All labs must be submitted together every week, one week after the experiment is completed. Late labs will be heavily penalized.

C)Assignments will occasionally be given to be completed during class time with a partner. These marks will be added to the lab mark total. Other homework is for the student's practice only

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:

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

DEPARTMENT POLICIES REGARDING LABS:

1. **All assigned laboratory exercises and reports must be completed with an overall grade of 60% in order 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.**
2. **At the discretion of the instructor, a student who is repeating this Physics course may apply for lab exemption.**

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.

Note that there will be NO help available after the 2:30 class on Mon or Tuesday so please see me BEFORE or save the question until the next day