

Camosun College Physics Department

Physics 151M – Technical Physics 2 Q2, 2002/2003

Course description: This course bridges Physics 11 (or PHYS 150) to the first year of Engineering Technology programs. Students investigate the concepts of kinematics, dynamics, equilibrium, geometric optics, mechanical waves and sound with applications to various technologies. Emphasis is on the development of skills in problem solving, laboratory procedure, and data analysis.

Prerequisites: Phys 150 or Physics 11.

Corequisite: Math 173, Math 176, or Math 178.

Instructor: Patricia Wrean (Pat)

Office: CBA 153

Office Phone: 370-4542

Email: wrean@camosun.bc.ca

Web Page: <http://www.camosun.bc.ca/~wrean/>

Office Hours: 11:30 – 12:20 Tuesday, Wednesday, Friday

12:30 – 1:20 Wednesday, Thursday

The Tuesday office hour is a drop-in hour held in CBA 101.

Please feel free to work on homework while eating your lunch.

Grade Calculation:

The final grade will be calculated according to the following breakdown:

Quizzes (4 or 5)	35%
Assignments	15%
Final exam	50%

The lowest quiz grade will be dropped when calculating the average of your quizzes. This allows a student to be absent on any one quiz day for any reason, including illness, without penalty. There is no provision for “making up” a missed quiz.

If your final exam grade is higher than your term work grade, then your final exam grade will count as 100% of your final grade.

Late policy: Late assignments will be given a penalty of 25% per week.

Labs:

Lab Instructor: Wilf Nienaber
Office: Tech 218 (office hours posted on door)
Office Phone: 370-4435
Email: nienaber@camosun.bc.ca

This course has both a lecture and a lab component. To complete a lab, the student must hand in their lab manual to the lab instructor and get his approval for the write-up.

All five labs must be completed to obtain a grade for the course. In addition, all labs must be handed in to the lab instructor before the final exam, or the student will not be allowed to write the final.

Materials required:

Text: Phys 151 Course Materials
Phys 151 Laboratory Manual
Scientific Calculator (any calculator is acceptable, with the exception of personal computers)
Ruler and Protractor
Graph Paper

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.

Grade Scale:

Final letter grades are normally assigned as follows (subject to the conditions above):

Percentage	Letter Grade
95 to 100	A+
90 to 94	A
85 to 89	A-
80 to 84	B+
75 to 79	B
70 to 74	B-
65 to 69	C+
60 to 64	C
50 to 59	D
below 50	

Outline:

Waves:

Ph 151 course materials, Chapter 5

properties of waves: speed, frequency, wavelength, amplitude

Section 5.1, p 5-1

types of waves: transverse/longitudinal

Section 5.2, p 5-3

wave speed: string/air

Section 5.3, p 5-8

interference: constructive/destructive

Section 5.6, p 5-6

beat frequency

p 5-17

standing waves

p 5-19

harmonics

p 5-22

----- Assignment #1, Test #1 -----

Kinematics:

Ph151 course materials, chapter 1

vectors and scalars

scale diagrams

vector addition

vector components

Section 1.8, p 1-19

2D acceleration and velocity

Section 1.5 & 1.6, p 1-5

2D projectiles with initial horizontal velocity

Section 1.9, p insert 1-4

relative velocity

----- Assignment #2, Test #2 -----

Dynamics:

Chapter 2

review of Newton's Laws

Section 2.1, p 2-1

2D dynamics problems

Section 2.2, p 2-2

using component method to solve 2D problems

connected objects

Section 2.2, p 2-5

circular motion

Section 2.3, p 2-11

----- Assignment #3, Test #3 -----

Equilibrium:

Chapter 3

first condition

forces in equilibrium

Section 3.1, p 3-1

second condition

torques

Section 3.2, p 3-9

centre-of-mass

p 3-12

torques in equilibrium

p 3-11

----- Assignment #4, Test #4 -----

Light:

Chapter 4

properties of light: speed, frequency, wavelength, EM spectrum	
light at an interface	Section 4.1, p 3
reflection:	
plane mirrors	Section 4.1, p 7
concave/convex mirrors	p 9
ray tracing	p 13
mirror equation, magnification equation, sign conventions	p 18
refraction:	
index of refraction	Section 4.2, p 23
Snell's Law	p 25
total internal reflection	p 27
converging and diverging lenses	p 34
ray tracing	p 36
lens equation and magnification equation	p 37

----- Assignment #5, Test #5 -----

Review