

## Department of Science and Technology

## PC1240 INTRODUCTORY GENERAL PHYSICS I 3.0 (3-0-3) UT(3)

Lectures	M W	10:00 - 11:20 p.m. J202
Laboratory	T or W or R	2:30 - 5:20 p.m. J103

**INSTRUCTOR:** Dr. Robert Hunt, P. Eng.  
**OFFICE:** C414  
**PHONE:** 539-2008/532-1338 (GPRC/HOME)  
**E-MAIL:** hunt@gprc.ab.ca  
**TEXT:** Physics. Cutnell and Johnson, 5th Edition

**COURSE CONTENT:**

Algebra-based course for students in life, environmental, and medical sciences. It guides the student through two distinct types of motion: motion of matter (particles) and wave motion. Vectors, forces, bodies in equilibrium, elasticity and fracture; review of kinematics and basic dynamics; conservation of momentum and energy; circular motion; vibrations; waves in matter; wave optics; sound; black body radiation, photons, de Broglie waves; models of the atom. Examples relevant in environmental, life and medical sciences will be emphasized.

**PRE-REQUISITE:** Physics 20 or equivalent, Pure Mathematics 30. Physics 30 is strongly recommended.

Credit may normally be obtained for only one of PC1010, PC1020, PC1080, PC1240, PC1440, or PC1310.

**MARK DISTRIBUTION:**

Assignments	15%
Laboratories	20%
Mid-Term Examination	20% (Oct. 23/02)
Final Examination	45% (TBA)

COURSE OUTLINE

Chapter 1	Summary of measurements, units and mathematics review.
Chapter 2	Speed, velocity, and uniform acceleration review.
Chapter 3	Vectors and two dimensional kinematics review.
Chapter 4	Forces, Newton's Laws of Motion, FBDs, friction, gravitation and equilibrium.
Chapter 5	Uniform circular motion, satellites and weightlessness.
Chapter 6	Work, energy, power and Work-Energy Theorem review.
Chapter 7	Impulse, linear momentum, 1 and 2-D collisions.
Chapter 8 (1-5)	Rotational kinematics and linear kinematics, angular and tangential variables.
Chapter 9 (1-6)	Rotational dynamics, torque, equilibrium, FBD and center of gravity.
MIDTERM (October 23, 2002 in class)	
Chapter 10 (1-6)	Hooke's Law, elasticity, simple harmonic motion, simple oscillations and periodic waves.
Chapter 16 (not 16.4)	Sound waves, speed of sound, intensity, standing waves, resonance, beats and applications of sound waves.
Chapter 17 (1-3)	Linear superposition, interference and reflection.
Chapter 25 (1-2)	Wave fronts and rays, reflection of light.
Chapter 26 (1-3)	Index of refraction; Snell's Law; total internal reflection, prisms and formation of rainbows.
Chapter 27 (1, 2, 5, 7)	Double-slit interference, diffraction grating and diffraction.
Chapter 29	Blackbody radiation, Planck's hypothesis, photoelectric effect, X-rays, Compton effect, photons, wave particle duality of light, de Broglie's hypothesis, uncertainty principle, atomic spectra and energy levels.
Chapter 36	Nature of the atom.

**LABORATORY COMPONENT**

Lab #	Source	Content	Week of
1	Exp. #1	Graphical and Error Analysis	Sept. 9
2	Handout	Vector Addition	Sept. 16
3	Exp. #3	Kinematics	Sept. 23
4	Exp. #2	Acceleration Due to Gravity	Sept. 30
5	Exp. #4	Atwood Pulley	Oct. 7
6	Exp. #5	Trans. of Mech. Energy	Oct. 14
7	Exp. #6	Collision Ramp	Oct. 28
8	Exp. #7	Standing Waves on a String	Nov. 4
9	Exp. #8	Speed of Sound in Air	Nov. 11
10	Exp. #9	Interference of Light	Nov. 18

**GRADING GUIDELINES**

Percent (Approx.)	Grade
90 - 100	9
80 - 89	8
72 - 79	7
65 - 71	6
57 - 64	5
50 - 56	4
45 - 49	3
26 - 44	2
0 - 25	1

(Cambridge System)

