

Grande Prairie Regional College

Department of Science

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

Lectures **M W** **10:00 - 11:20 p.m. J228**

Laboratory **W or R or F** **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, 6th 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. 23/03 evening)
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.

MIDTERM (October 23, 2003 Evening)

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.
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, 5)	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 30	Nature of the atom.

LABORATORY COMPONENT

Lab #	Source Content	Week of
1	Exp. #1 Graphical Analysis	Sept. 8
2	Handout Vector Addition	Sept 15
3	Exp #3 Non-Uniform Motion	Sept. 22
4	Exp. #2 Acceleration Due to Gravity	Sept. 29
5	Exp. #4 Atwood's Pulley	Oct. 6
6	Exp. #5 Potential and Kinetic Energy	Oct. 13
7	Exp. #6 Collision of Ball	Oct. 27
8	Exp. #7 Standing Waves on a String	Nov. 3
9	Exp. #8 Speed of Sound in Air	Nov. 10
10	Exp. #9 Interference of Light	Nov. 17

GRADING GUIDELINES

Descriptor	Grade
Excellent	A+
	A
	A-
Good	B+
	B
	B-
Satisfactory	C+
	C
	C-
Poor Minimal Pass Fail	D+
	D
	F

