Grande Prairie Regional College
Department of Science and Technology

PC 1080 – Introduction to University Physics I
Fall, 2000
3(3-1.5-3)UT

Course Outline

This is a non-calculus course in physics for students without Physics 30. Vectors, forces in equilibrium, linear and rotational motion, dynamics of particles and oscillations are topics of study.
Prerequiste: Pure Mathematics 30

Note: This course is intended to be taken in sequence with PC 1090. Not available to students with Physics 30 unless by prior consent from the Department. Credit may be obtained for only one of PC 1080, 1010, 1410 or 1310.

Instructor	Jaime P. Santiago J209 539-2865 santiago@gprc.ab.ca
Lecture	MWF 08:30 - 09:50 J229
Laboratory	R 14:30 – 17:20 J103
Textbook	College Physics, 5th Edition by Serway and Faughn Saunders College Publishers
	Physics 108, 109 Laboratory Manual University of Alberta

Marks Distribution

Problem Sets	15 %	
Laboratory Work	20 %	Students must pass the lab to pass the course.
Term Exams	30 %	
Final Exam	35 %	

Lecture Topics

Chapter	Time (Days)	Topic
1	4	Introduction: standards, dimensional analysis, significant figures, unit conversions, mathematics review
2	3	Motion in One Dimension: displacement, velocity and acceleration vectors, graphical analysis, uniformly accelerated motion, freely-falling bodies
3	3	Vectors and Two-dimensional Motion: vectors and scalars, properties of vectors, components, velocity and acceleration in two dimensions, projectiles, relative motion
4	5	Newton's Laws of Motion: applications, friction
5	4	Work and Energy: work, kinetic energy, work-energy theorem, potential energy, conservative and non-conservative forces, conservation of mechanical energy, conservation of energy in general
6	3	Momentum and Collisions: momentum, impulse, conservation of linear momentum, collisions in one and two dimensions
7	5	Circular Motion and the Law of Gravity: angular speed and acceleration, rotational motion under constant angular acceleration, relations between angular and linear quantities, centripetal acceleration and force, Newton's Law of Universal Gravitation, Kepler's Laws of Planetary Motion
8	5	Rotational Equilibrium and Rotational Dynamics: torque, rotational equilibrium, center of gravity, torque and angular acceleration, rotational kinetic energy and angular momentum
13	5	Vibrations and Waves: Hooke's Law, elastic potential energy, position dependent velocity, comparing simple harmonic motion and uniform circular motion, pendulum, damped oscillations, wave motion, types of waves, frequency, amplitude and wavelength, waves on a string, superposition and interference of waves, reflection of waves

Problem Sets

Set Number	Date Due	Problems
1	Sept. 18	Chapter 1 Conceptual Questions: #8 (additional question: If an equation is true, is it dimensionally correct?) Problems: #2, 11, 24, 32, 33
2	Sept. 25	Chapter 2 Conceptual Questions: #12 (a, b, c, d, g) Problems: #3, 10, 15, 18, 20
3	Oct. 2	Chapter 2 Problems: #30, 42, 48, 55, 60
4	Oct. 11	Chapter 3 Conceptual Questions: #20 Problems: #13, 14, 18, 21, 38, 46
5	Oct. 16	Chapter 4 Conceptual Questions: #5 Problems: #11, 17, 24, 36, 43
6	Oct. 30	Chapter 5 Conceptual Questions: #7 Problems: #13, 28, 52, 57, 60
7	Nov. 6	Chapter 6 Conceptual Questions: #14 Problems: #14, 18, 26, 41, 36
8	Nov. 20	Chapter 7 Conceptual Questions: #19 Problems: #10, 13, 25, 29, 58 (assume 5 years means 5 earth years)
9	Nov. 27	Chapter 8 Conceptual Questions: #17 Problems: #9, 14, 33, 40, 47
10	Dec. 4	Chapter 13 Conceptual Questions: #10 Problems: #8, 23, 30, 38, 43

Laboratory Work

Lab No.	Expt. No.	Date	Title
1	1	Sept. 7	Graphical Analysis
2	Handout	Sept. 14	Kinematics
3	2	Sept. 21	The Acceleration Due to Gravity
4	Handout	Sept. 28	Vectors
5	4	Oct. 5	Atwood's Pulley
6	5	Oct. 12	Conservation of Mechanical Energy
7	6	Oct. 19	Collision: Ramp
8	Handout	Nov. 2	Bending of a Beam
9	9	Nov. 16	Simple Pendulum
10	13	Nov. 23	Oscillations of a Spring