



**PC 1030 Introductory General Physics I  
(Mechanics) 4(3-1-3) UT(4)  
Fall 1992-93**

**Course Outline**

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**Calendar Description:**

**PC 1030 Introductory General Physics I (Mechanics) 4(3-1-3) UT(4) (FORMERLY: PC 203)** A non-calculus physics course for students without credit for Physics 30. Vectors, forces in equilibrium, linear and rotational motion, dynamics of particles, and oscillations. Intended to be taken in sequence with PC 1060 and PC 2040. Credit may be obtained for only one of PC 1030 or PC 1050.

**Prerequisite: MA 30**

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<b>Transfer Credits</b>	University of Alberta, Phys 105 (3 credits) University of Calgary, Phys 201 (3 credits) University of Lethbridge, Phys 1000 (3 credits) Athabasca University, Jr. Science (3 credits)
<b>Instructor:</b>	Dr. Jaime P. Santiago J209 539-2865
<b>Lecture:</b>	MWF 10:00 - 10:50 p.m., J202
<b>Laboratory:</b>	W or T or F 3:00 - 5:50 p.m., J103
<b>Seminar:</b>	R 12:30 - 1:20 p.m., J202 (Section S2)
<b>Textbook:</b>	<b>Physics 3rd Edition</b> , Douglas C. Giancoli (Prentice-Hall)
<b>Laboratory Manual:</b>	<b>Physics 105/106/204 Laboratory Manual</b> Physics Department, University of Alberta (McGraw-Hill Ryerson)
<b>Assignments:</b>	10 problem sets 20% deduction per day for late assignments Assignments more than 2 days late will not be accepted.



<b>Grading:</b>	Assignments	15%
	Laboratory	20%
	Midterm Exam I	10%
	Midterm Exam II	15%
	Final	40%

### 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

## Detailed Course Description

### A. Introductory Materials (Chapter 1)

1. What is physics and how is it related to other fields?
2. Physical models, theories and laws
3. Measurement and uncertainty
  - errors, sources of errors, significant figures
4. Units, standards and conversion of units
5. Mathematics review

### B. Kinematics in One Dimension (Chapter 2)

1. Scalars and vectors
  - Examples and properties
2. Coordinate systems and frames of reference
3. Displacement vector and average velocity vector
4. Instantaneous velocity
5. Acceleration; uniformly accelerated motion
6. Freely falling bodies – uniformly accelerated motion under action of gravity

### C. Kinematics in Two or Three Dimensions (Chapter 3)

1. Addition of vectors
  - graphics methods
  - analytic methods
2. Relative velocity
3. Projectile motion

### D. Dynamics (Chapter 4)

1. Force vector; Newton's First Law
2. Mass; Newton's Second Law
3. Newton's Third Law
4. Weight and the normal force

5. Solving problems using Newton's Laws

6. Friction

**E. Circular Motion and Gravitation (Chapter 5)**

1. Kinematics and dynamics of uniform circular motion

2. Non-uniform circular motion

3. Newton's Law of Universal Gravitation

4. Satellites and weightlessness

**F. Work and Energy (Chapter 6)**

1. Work done by a constant force

2. Work done by a varying force

3. Kinetic energy and the Work-Energy theorem

4. Potential energy and conservative force

5. Conservation of energy

6. Power

**G. Linear Momentum (Chapter 7)**

1. Definition of momentum

2. Relationship between change in linear momentum and force

3. Conservation of linear momentum

4. Collisions and impulse

5. Elastic collisions

6. Center of mass

**H. Rotational Motion (Chapter 8)**

1. Angular variables

2. Rotational kinematics

3. Torque

4. Moment of inertia

5. Rotational dynamics
  6. Rotational kinetic energy and angular momentum
  7. Conservation of angular momentum
- I. Equilibrium and Elasticity (Chapter 9)**
1. Statics; conditions for equilibrium
  2. Simple machines
  3. Stability
  4. Elasticity
- J. Vibrations and Waves (Chapter 11)**
1. Simple harmonic motion
  2. Periodic and sinusoidal nature of simple harmonic motion
  3. Energy in simple harmonic motion
  4. Simple pendulum
  5. Damped harmonic motion, forced vibrations and resonance
  6. Wave motion
  7. Types of waves
  8. Energy carried by waves
  9. Properties of waves
  10. Standing waves

**Laboratory Work**

Number	Week of	Expt. #	Title
1	Sept. 7	Handout	Introductory Laboratory Exercises
2	Sept. 14	Handout	Micrometer and Vernier Calipers
3	Sept. 21	1	Introduction
4	Sept. 28	2	Kinematics
5	Oct. 5	Handout	Vector Addition
6	Oct. 12	3	Acceleration due to Gravity
7	Oct. 26	4	Atwood's Pulley
8	Nov. 2	6	Transformation of Mechanical Energy
9	Nov. 9	7	Collision Ramp
10	Nov. 16	10	Bending of Beam
11	Nov. 23	5	Simple Pendulum
12	Nov. 30	8	Hooke's Law