Grande Prairie Regional College
Academic Upgrading Department

SEP. 18 2001

Physics 0110
Course Outline

Instructor: Sukhvir Sandhu

Office:

Phone:

Class Time: Monday & Friday 9:00 – 9:50 am in B201
Wednesday 8:30 – 9:50 am in B201

Office Hours: 8:30 to 9:00 (M & F) in B201
8:30 to 9:30 (T & R)

Prerequisite: SC 0100

Co-requisite: Ma0100 or Ma0110 placement
Recommended : at least 6 in MA0100 / Grade 9 math

Textbook:

Supplies: A binder with lots of paper: lined, plane, and graph; paper dividers; scientific calculator, colored pens or pencils, 2 or 3 plastic folders, ruler, rubber etc.

Course Goals:

- To provide knowledge and skills in selected topics in physics.
- To develop an appreciation of the importance of physics in modern society and in day-to-day life.
- To develop problem-solving skills.

Attendance: Regular attendance, which is crucial for passing the course, is expected of all students. Students who miss classes will soon find themselves falling behind and failing. If you miss a class because of illness and other legitimate reason, please see me about catching up. Students with more than 20% absences may be debarred from writing the final exam. On the other hand, regular attendance and class participation will contribute towards your final marks.

Tests and Exams: There will be 4 tests throughout the term and a final exam at the end of the term. The tests and the final exam must be written at scheduled times. A missed test/exam will result in a score of zero unless prior arrangement to write the test/exam at some other time has been made with the instructor.

Assignments: A major part of the assigned homework will be closely examined and marked. You will be asked to submit your prior marked work along with the new assigned work so that I can monitor the improvements on a regular basis. The assigned work will not be graded later than one day without the prior approval of the instructor.

Labs: There will be 3 – 4 labs throughout the term. Attendance is compulsory in all labs. A missed lab will result in a mark of zero for that lab. Make-up labs cannot be guaranteed, and may be permitted only under special circumstances.

Evaluations:

Tests	20% (4 tests)
Assignments & Lab Reports	35%
Attendance & Participation	10%
Final Exam	35%

Course Content:

Unit 1: Describing motion (Test #1)

Unit 2: Forces (Test #2)

Unit 3: Work, power, and energy (Test #3)

Unit 4: Heat, temperature, and calorimetry (Test #4)

The Final Exam

The 9-Point Grading System

9 or 8 (80 % and above) -------- Excellent
7 or 6 (65 % to 79%) ---------- Good
5 or 4 (50% to 64%) ---------- Pass
3, 2, or 1 (below 50%) -------- Fail

Course Objectives

The following are the minimum objectives which must be achieved in the course. More objectives may be added later depending upon the rate of progress.

Unit 1: Kinematics

On completing this unit, you should be able to:

- Define and distinguish between distance and displacement giving examples.
- Define and identify scalar and vector quantities.
- Define and explain speed and velocity – average and instantaneous. State their units.
- Define and explain acceleration and state its units.
- Explain why time appears twice in the acceleration unit.
- Draw distance-time, and velocity-time graphs. Determine velocity and acceleration from them as slope of the respective graph.
- Derive the following formulas from basic principles:

- Use the international sign conventions for directions – positive and negative
- Apply the above formulas in relevant situations to solve problems.
- Define acceleration due to gravity, "g", and state its value. Also be able to explain the dependency of the value of "g" on different locations.
- Solve problems involving "g".

Write Test # 1

Unit 2: Force

On completing this unit, you should be able to

- State and explain Newton's First Law of Motion giving examples. Explain inertia.
- Explain some phenomena in everyday life involving Newton's First Law.
- Define force and its units
- Distinguish between mass and weight, and state their units.
- State and explain Newton's Second Law of Motion and derive the expression F=ma from the Second Law.
- Explain the force of friction, and incorporate it in problems involving force.
- Solve problems based on the Second Law.
- State and explain Newton's Third Law of Motion, and apply it to relevant situations
- Solve problems based on the Third Law.

Write Test # 2

Unit 3: Work, Energy, and Power

On completing this unit, you should be able to:

- Define and explain work done by a force, and state units of work.
- Identify situations in which a force does not do any work.
- Define and explain energy and state its units.
- Name different forms of energy, and explain the principle of conservation of energy.
- Explain kinetic and potential energies, and using the principles of conservation of energy, convert kinetic energy into potential energy, and vice-versa.
- Explain the relation between work and energy, and using the relation, convert one into the other.
- Define and explain power, and state its units.
- Explain the working of a simple pulley, and that of a wheel and axle as simple machines. Explain mechanical advantage and efficiency of simple machines, and how they are calculated.
- Solve problems based on the above three simple machines.

Write Test #3

Unit 4: Heat

On completing this unit, you should be able to:

- Describe heat as thermal energy, and state its units.
- Define temperature, and distinguish between heat and temperature.
- Explain the Celsius and Kelvin (Absolute) scales of temperature, and convert one into the other.
- Define and explain specific heat capacity (or simply heat capacity), and state its units.
- Discuss the implications of the high heat capacity of water, and how it modifies the climate of coastal cities.
- State the relation between amount of heat, and use this relation to solve related problems.
- Define and explain heat of fusion and heat of vaporization. State its units.
- Use the heat of fusion and heat of vaporization to calculate the amount of heat absorbed or released when substances undergo phase changes.
- State the principle of hear of transfer and use the principle to solve related problems.

Write Test #4

Write the Final Exam