DEPARTMENT OF ACADEMIC UPGRADING
COURSE OUTLINE PHYSICS 0110

INSTRUCTOR:	NANCY FRASER	**PHONE:**	539 – 2980
OFFICE:	J – 216	**E-MAIL:**	nfraser@gprc.ab.ca
OFFICE HOURS:	AS POSTED ON MY OFFICE DOOR		

PREREQUISITES/COREQUISITES(s): SC0110 or permission of the Department

REQUIRED TEXT/

RESOURCE MATERIAL:

- There is no required textbook. If you are taking SC 0110 that textbook will be helpful.
- Lab notebook (250 page coiled notebook is fine do not spend the money on a real lab notebook)
- **Non**programmable calculator – this is the only electronic devise allowed during tests or exams.
- 10 quad to 1 cm graph paper are also required.

CALENDAR

DESCRIPTION: The major concepts to be covered include linear motion, force, work, energy, power, and heat.

CREDIT/CONTACT HOURS: PC 0110-Physics Grade 10 Equivalent; 3 (3-0-0.5) HS
Time: 52 Hours

DELIVERY MODE(S): This course is a lecture and lab course which requires student participation. The course is divided into four weighted units. Each unit includes one or more assignments, regular homework checking, a unit test, and/or lab.

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.

Part One: Review — Approximately 3 days

On completing this section, you should be able to:

1. Re-arrange formulas for different variables
2. Correctly use scientific notation
3. Apply rules for rounding off and correct use of significant digits

Unit 1: Kinematics — Approximately 10 days

On completing this unit, you should be able to:

1. Define and distinguish between distance and displacement giving examples.
2. Define and identify scalar and vector quantities, giving examples.
3. Define and explain speed and velocity; average and instantaneous. State their units.
4. Define and explain acceleration and state its units.
5. Explain why time appears twice in the acceleration unit.
6. Draw distance-time, and velocity-time graphs. Determine velocity and acceleration from the slopes of the respective graph. Determine displacement from the area under a velocity-time graph.
7. Apply the following formulas in relevant situations to solve problems.

$$v = \frac{x}{t} \quad ; \quad v = \frac{v + v_0}{2} \quad v = v_0 + at \quad ;$$

$$x = \left(\frac{v + v_0}{2}\right)t \qquad x = v_0 t + \tfrac{1}{2}at^2 \qquad v^2 = v_o^2 + 2ax$$

8. Use the international sign conventions for positive and negative directions
9. 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.
10. Distinguish between mass and weight, and state their units.
11. Solve problems involving "g."

Write Test # 1

Unit 2: Force and Newton's Laws of Motion — Approximately 10 days

On completing this unit, you should be able to:

1. Define and explain force, and state its units
2. State and explain Newton's First Law of Motion giving examples. Explain inertia and its relation to the First Law.
3. State and explain Newton's Second Law of Motion and derive the expression F = ma.
4. Explain the force of friction, and incorporate it in problems involving force.
5. Solve problems based on the Second Law.
6. State and explain Newton's Third Law of Motion, and apply it to relevant situations.
7. Solve problems based on the Third Law.

Write Test # 2

Unit 3: Work, Energy, and Power — Aproximately 10 days

On completing this unit, you should be able to:

1. Define and explain energy and state its units.
2. Name different forms of energy, and explain the principle of conservation of energy.
3. Explain kinetic and potential energies, and using the principles of conservation of energy, convert kinetic energy into potential energy, and vice-versa.

4. Define and explain work done by a force, and state units of work.
5. Identify situations in which a force does not do any work.
6. Calculate work done in different situations.
7. Explain the relation between work and energy, and using the relation, convert one into the other. Solve related problems.
8. Define and explain power, and state its units. Solve related problems.
9. Explain the working of a simple machines; the pulley, the wheel and axle and lever. Explain mechanical advantage and efficiency of simple machines, and how they are calculated.
10. Solve problems based on the above three simple machines.

Write Test # 3

Unit 4: Heat — Approximately 11 days

On completing this unit, you should be able to:

1. Describe heat as thermal energy, and state its units.
2. Define temperature, and distinguish between heat and temperature.
3. Explain the Celsius and Kelvin (Absolute) scales of temperature, and convert one into the other.
4. Define and explain specific heat capacity (or heat capacity) , and state its units.
5. Discuss the implications of the high heat capacity of water, and how it modifies the climate of coastal areas.
6. State the relation between the mass of a substance and its heat capacity, amount of heat and temperature change. Solve related problems.
7. Define change of state, define and explain heat of fusion and heat of vaporization. State their units.
8. Use the heat of fusion and heat of vaporization to calculate the amount of heat absorbed or released when substances undergo phase changes.

******* If there is time remaining ELECTRICITY will be introduced.**

TRANSFERABILITY: ** Grade of D or D+ may not be acceptable for transfer to other post-secondary institutions. Students are cautioned that it is their responsibility to contact the receiving institutions to ensure transferability.

GRADING CRITERIA: Regular attendance is expected of all students, and is crucial to passing this course. Students who miss classes will soon find themselves falling behind and failing. Lateness will **not** be tolerated as it interrupts the instructor and fellow classmates.
As per Department Policy, if you miss more than 10 per semester of classes in any course, you may be debarred from the final exam for that course.
A certificate (a doctor's or a note from the funeral home) will be required to make up the midterm or final exam. **You will receive a grade of F if you miss the final.** Call if you are going to miss a test. There maybe a deduction of 10% for test rewrites.
There are **NO** 'make up' labs in this course. Being absent from an experiment will result in a grade of **ZERO** for that experiment.
Lab reports must be submitted on the required date and by the required time.
Assignments may not be accepted after the assignment has been returned to the class. I am usually a speedy marker and usually return papers the next day.
Penalties for late **assignments** are as follows: (Assuming that I have not returned the marked assignments)
1 day late –20%, 2 days late –50%, 3 days late –100%

Penalties for late **lab reports** are as follows:
5 minutes after due time –10 %, 24 hours after due time –100%

The Final exam is set by the Student Services. It will be composed of material from the while course.

Marking Scheme:

Lab Reports:	15%
Assignments:	15%
Tests:	30%
Final Exam:	40%
Total	100%

GRANDE PRAIRIE REGIONAL COLLEGE			
GRADING CONVERSION CHART			
Alpha Grade	**4-point Equivalent**	**Percentage Guidelines**	**Designation**
A^{+}	**4**	**90 – 100**	**EXCELLENT**
A	**4**	**85 – 89**	
A^{-}	**3.7**	**80 – 84**	**FIRST CLASS STANDING**
B^{+}	**3.3**	**77 – 79**	
B	**3**	**73 – 76**	**GOOD**
B^{-}	**2.7**	**70 – 72**	
C^{+}	**2.3**	**67 – 69**	**SATISFACTORY**
C	**2**	**63 – 66**	
C^{-}	**1.7**	**60 – 62**	
D^{+}	**1.3**	**55 – 59**	**MINIMAL PASS**
D	**1**	**50 – 54**	
F	**0**	**0 – 49**	**FAIL**
WF	**0**	**0**	**FAIL, withdrawal after the deadline**

STUDENT RESPONSIBILITIES:

Students will:

- review material that is prerequisite to this course quickly so it does not slow you down. (See Assumed Background Knowledge on pages 2 & 3. Especially the section on nomenclature.)
- be at class regularly and on time. (If you miss more than 10 per semester of classes in any course, you may be debarred from the final exam for that course.)
- complete all pre class and pre-lab assignments before arriving in class.
- keep up with course material.
- if experiencing difficulties with course get help immediately.
- catch up on missed material before the next class.
- provide documentation for missed midterms or finals.
- be aware of penalty for failing the lab component and not writing the final.

STATEMENT ON PLAGIARISM AND CHEATING:

Please refer to pages 50 – 51 of the College calendar regarding plagiarism, cheating and the resultant penalties. These are serious issues and will be dealt with severely. The College calendar is available on line.