

GRANDE PRAIRIE REGIONAL COLLEGE
PHYSICS 0130
COURSE OUTLINE
FALL 1993

INSTRUCTOR Sukhvir Sandhu

OFFICE: C204

OFFICE HOURS: 11:00 a.m. - 12:00 p.m.
1:30 p.m. - 2:20 p.m. Tuesday and Thursday
other times by appointment

PHONE: 539-2831

PREREQUISITE: MA 0120 or MA 0130 placements, PC 0120
Recommended: at least 5 or 6 in MA 20/0120 and PC 20/0120.

TEXT BOOK: MODERN PHYSICS by Frederick E. Trinklein.
Notebook, binder, looseleaf, plain paper, stapler, pencil, pen and calculator
with trigonometric functions and exponential functions, math set.

COURSE GOALS: This course is designed to provide the students with an understanding of basic concepts and principles of physics (Law of vectors, force, motion, equilibrium, work, power and energy; Electrostatics and current electricity; Electromagnetism). The student will develop problem solving skills and gain an appreciation of the physics of modern society.

ATTENDANCE: Regular attendance is expected from all students and is essential for passing the course. Students who miss classes will find themselves falling behind and failing. Note that students missing 20% or more of the classes may not be permitted to write the final exam. Classes will start right on time, so please arrive a few minute early.

ASSIGNMENTS: There are seven or eight assignments throughout the term. Each assignment contains two essay-type questions and six to eight problems. Assignments are due the next day after the unit is done. Late assignments will be penalized 10% per day to a maximum of 20%. Assignment will not be accepted beyond two working days past the original deadline unless there is a valid reason.

Tests and Exams: There are four tests, a midterm exam, and a final exam throughout the term. The tests will be given after finishing each two units. Absence from tests, quizzes or exams will result in a 0 mark; unless previous arrangement is made with the instructor or absence is for medical or other legitimate reasons. College team members must notify the instructor prior to the test date if they are to be away.

LABS:

There will be nine or ten labs during the course, starting in the second week of the semester. This important component of the course is designed to introduce basic laboratory skills and reinforce concepts introduced in lectures!

The following lab policies are enforced by all the members of the science courses in the Academic Development Department.

- a) Students must pass the lab component by 50% as a requirement for receiving credit in the course.
- b) Failure of a student to submit three or more lab reports or lab assignments constitutes ground for being debarred from the final exam for the course.
- c) Students are solely responsible for attending labs. However, given a justifiable excuse with a documentation, a student may be granted exemption from one missed lab, after which missed labs will receive a grade of zero for those labs. Lab make-up opportunities shall not be granted.

Formal lab reports are due one week after the lab is done. Handouts for labs will be distributed in the class ahead of time. No lab reports will be accepted after the deadline.

EVALUATION:

Assignments	24%
Tests	16%
Lab Reports	20%
Mid-Term Exam	10%
Final Exam	<u>30%</u>
Total	100%

<u>GRADING:</u>	<u>9-point Grade</u>	<u>Percentage Equivalence</u>	<u>Designation</u>
	9	90-100	Excellent
	8	80-89	
	7	72-79	
	6	65-71	Good
	5	57-64	
	4	50-56	Pass
	3	45-49	Fail
	2	26-44	
	1	0-25	

Any student wishing to withdraw from the course must do so officially before November 5 in order to avoid receiving a failing grade.

LEARNING OBJECTIVES:

Unit 1:

Review (Text Reference: Chapter 1,2 Mathematics Refresher)

- a) Describe the nature of science.
- b) Describe the basic properties of matter.
- c) Describe the basic properties of energy.
- d) Discuss the relationship between matter and energy.
- e) Describe and discuss the subdivisions of physics.
- f) Describe the metric units of measure.
- g) Define and calculate the accuracy and precision of a group of measurement.
- h) Identify and apply appropriate mathematical operations to solve physics problems.
- i) Review mathematics skills.
- j) Vectors.

Unit 2:

Velocity and Acceleration (Chapter 3)

- a) Define displacement, speed, velocity and acceleration.
- b) Solve problems dealing with accelerated motion.
- c) Discuss and apply Newton's three laws of motion.
- d) Discuss and apply Newton's law of universal gravitation.

Unit 3:

Concurrent and Parallel forces (Chapter 4)

- a) Identify forces as vectors.
- b) Define and calculate resultant and equilibrant forces.
- c) Resolve forces into components.
- d) Define and identify frictional forces.
- e) Solve problems involving frictional forces.
- f) Define and calculate torque.
- g) Solve motion problems by applying the two conditions of equilibrium.

Unit 4:

Two-Dimensional Motions (Chapter 5)

- a) Path or projectile fired horizontally.
- b) Projectile fired at an angle with the horizontal.
- c) Calculate the range, the maximum height reached and the time of flight of a projectile.
- d) Solve other related problems.
- e) Define and calculate centripetal acceleration.
- f) Distinguish between centripetal and centrifugal force.
- g) Define and identify harmonic motion.

Unit 5:

Conservation of Energy and Momentum (Chapter 6)

- a) Define and calculate work and power.
- b) Define and calculate kinetic energy and potential energy.
- c) Define and calculate impulse and momentum.
- d) Apply the law of conservation of energy and momentum to solve motion problems.
- e) Differentiate between elastic and inelastic collisions.

Unit 6:

Electrostatics (Chapter 16)

- a) Describe the two kinds of electrostatic charge and how each is transferred.
- b) Define Coulomb's law.
- c) Describe potential difference.
- d) Show electric field mapping along with a quantitative discussion.
- e) Describe the properties of conductors and nonconductors.
- f) Show how capacitors store electric charge.
- g) Describe the relationship between potential difference, capacitance and amount of charge.

Unit 7:

Direct Current Circuits (Chapter 17)

- a) Discuss the nature of electric current in terms of charge.
- b) Analyze series and parallel circuits.
- c) Define Ohm's law.
- d) Discuss internal resistance and emf.
- e) Define the measurements of voltage, current, resistance in series and parallel circuits.
- f) State and apply Kirchoff's rule to electric circuits.
- g) State electric power and be able to solve related problems.

Unit 8:

Electromagnetism (Chapter 19 & 20)

- a) Discuss the link between an electric current and magnetism.
- b) Magnetic field and charge in motion.
- c) Electromagnet.
- d) Galvanometer, Voltmeter, Ammeter, Ohmmeter.
- e) Study the distinction between an applied emf and an induced emf.
- f) Discuss Faraday's laws.
- g) Describe the factors that affects an induced emf.
- h) Describe the generator principle.
- i) Describe the motor principle.