SAULT COLLEGE OP APPLIED ARTS & TECHNOLOGY

SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: APPLIED PHYSICS I

Code No.: PHY 100-3

Program: WATER RESOURCES/PULP & PAPER ENGINEERING TECHNOLOGY

Semester:

Date; JANUARY, 1986

Author: D. HEGGART

New: Revision:

APPROVED: _____ Date I/K^

Chairperson

CALENDAR DESCRIPTION

APPLIED PHYSICS I — COURSE NAME

PHY 100-3 — COURSE NUMBER

PHILOSOPHY/GOALS: This course covers Introductory topics such as measurement forms of energy, graphs and their interpretations and vectors. This is folowed by a study of mechanics including force and motion, work, energy and power and theory of basic machine. A final unit on the mechanical properties of matter with particular emphasis on liquids, especially water and gases is presented.

METHOD OP EVALUATION (GRADING): Three term tests, one at the end of each of Parts 1, 2 and 3. These tests will have the following weightings:

TEST #1	15 marks
TEST #2	35 marks
TEST #3	i*0 marks
QUIZZES -	10 marks
TOTAL	100 marks

A = 80--100?
B = 70-- *19%*
C =: 60-- 69%
I =: < (50%

Eighty percent attendance is required to have the right to write any term test.

Students wo have achieved less than 60% but more than 45% on all of the above may have the opportunity to write a supplemental test covering all of the course. This is only granted where all of the tests have been written and satisfactory attendance has been maintained •

TEXTBOOK:

Harris and Hemmerllng; Introductory Applied Physics, 4th edition. McGraw-Hill, 1980.

APPLIED PHYSICS I. .,3

PART *1^ 2.* INTRODUCTION, MEASUREMENT AND GRAPHIC METHODS - 12 HOURS

OBJECTIVES

1. To state the Importance of physics to modern technology and to the work of technologists in their understanding of matter and energy.

*2** To state the importance of and make calculations of some necessary mathematical skills in formula manipulations, trigonometric functions and solid geometry.

3- To interpret graphs and to prepare graphs from raw data.

4. To make sure that all students state the essential units of measurement (length, mass, area and volume) in both the SI metric system and the English system of measurement, and to covert from one system to another.

5. To apply the concept of vector and scalar quantities to problem solving.

6. To solve problems of structures - equilibrium of coplanar forces.

7. To solve force problems by graphical and analytical methods-

8. To state relationships in concurrent and parallel force systems•

TEST #1

APPLIED PHYSICS *1..A*

PART 2^ ^ **f^CHANICAL** PROPERTIES OP MATTER: STRUCTURE OP MATTER, PROPERTIES OP SOLIDS, LIQUIDS, GASES - 14 HOURS

OBJECTIVES:

1. To apply basic chemical and physical theories to the structure and properties of matter.
2. To apply the kinetic-molecular theory of matter to gases.
3. To relate molecular motion and gas pressure.
4. To distinguish between elements, compounds, and mixtures.
5. To calculate mass density and weight density of the three forms of matter*
6. To use the relationship between mass-density units and specific gravity.
7. To apply the properties of liquids at rest and in motion.
8. To determine the specific gravity of liquids and solids.
9- To apply Pascal's law in hydraulic systems.
10. To apply Archimedes' principle to such examples as submarines, deep-sea vessels, hydrometers, measurement of specific gravities, etc.
11. To apply Bernoulli's principle for fluid flow in pipes or channels under steady-state conditions.
12. To apply principles of physics for flood control, conservation of water resources, and the development of power from impounded water•
13. To calculate the condition of a gas as determined by pressure, volume, and temperature.
14. To investigate the operation of liquid pumps that utilize atomospheric pressure.
15. To investigate those gases that are highly important in today's industrial economy.
16. To apply the gas laws to current problems of air pollution.

TEST #2

APPLIED PHYSICS I. ,.5

PART 2 Z MECMNICS; FORCE, MOTION, WORK, ENERGY, POWER, FRICTION
18 HOURS

OBJECTIVES

1. To understand dlstance-tlme-velocity relationships.
2. To develop the relationships governing force and motion, inertia and mass, and Impulse and momentum*
3. To solve problems involving the acceleration of gravity, the laws of projectile motion and Newton's Laws of Motion.
^. To correctly use the several systems of units required for the study of applied physics - SI metric (mks) ft-slug-sec, and ft-lb-sec (fps) units.
5- To analyze and solve elementary problems in mechanics.
6. To develop the concept of energy as a unifying thread in the study of applied physics and use it to solve problems.
7. To develop the related ideas of the law of conservation of energy and the principle of work and use it to solve problems.
8. To understand the relationships between work, energy, and power in modern industry.
9. To develop an understanding of both English (engineering) and Sl-metric as used in work-energy-power relationships.
10. To develop the concepts of momentum, impact, and reaction.
11. To apply the input-output relationships involved in work, energy, and power - the idea of efficiency.
12. To set up and solve speedily and accurately elementary problems involving work, energy, and power.
13. To Investigate the basic principles of the simple machines - how they apply forces and how they do work.
14. To analyze and solve problems from considerations of the principle of work.
15. To use concepts of mechanical advantage and efficiency in problems involving simple and complex machines.
16. To solve problems where friction is a factor.

TEST #3