SAULT COLLEGE OF APPLIED ARTS **AND** TECHNOLOGY

SAOLT STE. MARIE, ON

COURSE OUTLINE

COURSE TITLE: PHYSICS

CODE NO.:   PHY 125-5   SEMESTER: ONE

PROGRAM: AVIATION TECHNOLOGY - FLIGHT

AUTHOR: G. DISANO

DATE: JUNE 1989   PREVIOUS OUTLINE DATED: AUGUST 1988

APPROVED: _____   ^9/oBhEL

       CHAIRPERSON   DATE

PHYSICS   PHY 125-5

COURSE NAME   CODE NO.

TOTAL CREDIT HOURS   60

PREREQUISITE(S):

I. PHILOSOPHY/GOALS; This course will provide both a review of, and a more in depth study of many of the concepts of applied physics intro- duced in secondary school physics courses> An attempt will be made to limit the topics to those which should be relevant to the flight studeni

II. STUDENT PERFORMANCE OBJECTIVES:

Upon successful completion of this course the student will-be able to:

1) in his/her own words write definitions for the concepts introduced,

2) answer questions requiring a knowledge of the concepts presented*

3) respond to questions requiring extrapolation of the course content,

4) solve problems requiring an understanding of the course theory,

5) spply "t^Q knowledge to other courses which are 'physics based',

III. TOPICS TO BE COVERED:

1) INTRODUCTION

2) MECHANICS - STATICS & DYNAMICS

3) MECHANICAL PROPERTIES OF SOLIDS, LIQUIDS & GASES

4) TEMPERATURE & HEAT

5) WAVE MOTION *So* SOUND (See YIII - Special Notes page 3)

IV.   LEARNING ACTIVITIES   REQUIRED RESOURCES

                      (Optional)

PHYSICS	**PHY** 125-3
COURSE NAME	CODE **NO**

V. EVALUATION METHODS:

See attached sheet: <u>GHADE REQUIREMEHTS</u>

VI. REQUIRED STUDENT RESOURCES

Harris and Hemmerling, <u>INTRODUCTORY APPLIED PHYSICS</u>,
Fourth edition, McGraw-Hill Book Company. Toronto.
1980.

VII. ADDITIONAL RESOURCE MATERIALS AVAILABLE IN THE COLLEGE LIBRARY

<u>Book Section</u>:

<u>Periodical Section</u>:

<u>Audiovisual Section</u>:

VIII. SPECIAL NOTES

The course outline as detailed on pages 4- and 5 lists the
subtopics to be covered under each of the five main topic
headings. Some subtopics may be deleted **from the outline**
at the discretion of the instructor and/or others may be
introduced.
Topic V is optional; however, time permitting it will be
covered. This creates the possibility for some latitude
in the grading scheme as detailed on page 6.

Suggested Text: <u>Introductory Applied Physics</u> by Harris & Hemmerling

TOPIC **NO.**	*PERIODS*	*TOPIC DESCRIPTION*	*REFERENCE*

^   <u>Introduction</u>   Chapters 1,2,5

                            a) mathematics of basic physics
                            b^ the SI metric system of measure
                            c) the Imperial system of meastire
                            d^ 'base' quantities and 'base' units
                            e) S.I. prefixes and their abbreviations
                            f; 'derived' quantities and 'derived' units
                            g) conversion of units of measure
                            h) significant figxares
                            i) 'accuracy' and 'precision'
                            j) 'vector' and 'scalar' quantities
                            k) graphical and mathematical methods of
                                 adding and subtracting vector quantities

II   <u>Mechanics * Statics & Dynamics</u>   Chapters 4-,5,6,7

                            a^ forces
                            b) the distinction between mass and weight
                                'distance' and 'displacement'
                                'speed' and 'velocity'
                                'acceleration'
                                equations of uniformly accelerated motion
                                the acceleration of gravity - free fall
                                Newton's First Law of Motion
                                Newton's Second Law of Motion
                                Newton's Third Law of Motion
                            k) work
                            1) kinetic energy
                            m) gravitational potential energy
                            n) conservation of energy
                            o) power
                            p) efficiency
                            q) mechanical advantage (actual)
                            r^ velocity ratio (ideal mechanical advantage)
                            s) some simple machines
                            t) angular measurement
                            u) angular velocity
                            v) centripetal acceleration
                            w) centripetal and centrifugal forces

Ill   <u>Mechanical Properties of Solids^</u>   Chapters 9,10,11,
                                 12
                  <u>Liquids and Gases</u>

                      mass density
                      weight density
                      specific gravity
                      pressure
                      units of pressure measurement
                      pressure at a depth in a liquid
                      Pascal's law
                      the hydraulic press
                      Archimedes' principle
                      absolute pressure and gauge pressure
                      atmospheric pressure

IV   <u>Temperature **fitnd Heat**</u>   Chapters 13,14,15

                      temperature
                      temperature scales
                      absolute temperature scales
                      heat
                      linear expansion of solids
                      area expansion of solids
                      volume expansion of solids
                      volume expansion of liquids
                      Boyle's gas law
                      Charles' gas law
                      the general gas law
                      units of heat measurement
                      specific heat capacity
                      changes of state
                      specific latent heat of fusion
                      specific latent heat of vapourization

<u>Wave Motion and Sound</u>   Chapters 18,19

a) methods of heat transfer
b^ Hooke's law
c) simple harmonic motion
d^ period, frequency and amplitude
e) types of waves
    speed of wave s
    sound
    speed of sound
    loudness and intensity of sound

GRADE REQUIREMENTS

PHT125

PHTSICS
(Aviation Technology - Flight)

Your final grade in PHY125 will be determined on the basis of four tests to be administered during the semester. Each test will examine your knowledge of a number of topics and will be administered within one week of completing those topics. The topics covered in each of the four tests are as follows:

> Test #1———Topic Niomber I & Topic Number II(1)
>
> Test #2———Topic Number 11(2)
>
> Test #3———Topic Ntimber III
>
> Test #4———Topic Number IV

The four tests are of equal weight (i.e. each of the four tests is worth 25^ of your final grade). As a result, provided you have received a passing grade in each of the four tests« your final grade will simply be an average of your four test results. In order to obtain your letter grade the following percentage-letter grade equivalents will be used:

> A"^ :   90^ - 100^ (Consistently outstanding achievement)
>
> A   :   80?^ - 895^ (Outstanding achievement)
>
> B   :   70^ - 79^ (Consistently above average achievement)
>
> C   :   55^ - 69/^ (Satisfactory or acceptable achievement)
>
> X or R   0^ - $b^\%$ (Incomplete or Repeat)

If yovir final average is below 55^» or if you have received a failing grade in one or more of the unit tes"Fs, whether you receive an 'X' (Incomplete) or an 'R' (Repeat) grade is entirely at the instructor's discretion. The decision will be based upon your final average (e.g. 52^ would result in an R grade while 50^ might result in an X grade;; your attendance diiring the semester; your attitude while in the class-room; your perceived level of effort during the semester; etc..

In any case, should you find yourself with an X grade at the end of the semester, in order to upgrade your mark to a passing grade you will be required to write a make-up examination covering the entire course content. Should you receive a passing grade on the make-up examination (55^ or higher) yoior X grade will be upgraded. The best you can do after receiving an X grade as a result of a failing average is a C! If you were required to write the make-up examination as a result of having failed one test you **may** substitute the exam result for this test result.

Prior to administering any test you will be notified a full week in advance. Should you for any reason not be able to be in attendance on a day for which a test has been scheduled it is your responsibility to notify the instructor prior to the test! If your reasons are acceptable a date will be set during which you may write a substitute test for the one you have missed.

> G. Disano, June 1989