Douglas College

Course Information

A: Division: INSTRUCTIONAL

DATE: May 27, 1997

B: Department: SCIENCE & TECHNOLOGY

New Course: _____

Revision of Course Information form: X

DATED: November 29, 1993

C: PHYS 104 (Subject & Course No.) D: Practical Physics (Descriptive Title) E: 5 (Semester Credit)

F: Calendar Description: This is a course designed primarily for students who intend to pursue technology studies. It can also serve as a review or upgrading course prior to PHYS 107 or PHYS 207 (non-calculus level, first-year university transfer courses). The areas to be covered include mechanics (vectors; statics; one-dimensional motion; work, energy and power; simple machines; circular motion; and hydrostatics), heat (temperature and thermal properties of matter), and electricity (electrostatics and direct current circuits).

Summary of Revisions:
(Enter date & section)
Ex: Section C,E,F, &R

1997-05-29

H

G: Type of Instruction: Hours Per Week/ Per Semester

Lecture	4	Hrs.
Laboratory	3	Hrs.
Seminar	____	Hrs.
Clinical Experience	____	Hrs.
Field Experience	____	Hrs.
Practicum	____	Hrs.
Shop	____	Hrs.
Studio	____	Hrs.
Student Directed Learning	____	Hrs.
Other	____	Hrs.

TOTAL 7 HOURS

H: Course Prerequisites:
Mathematics 11 (C or higher)

I: Course Corequisites:

J: Course for which this course is a pre-requisite

K: Maximum Class Size:
36

M: Transfer Credit:
Requested ___
Granted ___
Specify Course Equivalents or Unassigned Credit as Appropriate

U.B.C.
S.F.U.
U. Vic.
OTHER:

L: College Credit Transfer _____

College Credit Non-Transfer X

COURSE DESIGNER(S)

VICE PRESIDENT (INSTRUCTION)

DEAN

REGISTRAR

N: Textbooks and materials to be purchased by students
(Use Bibliographic Form):

W. Thomas Griffith, **The Physics of Everyday Phenomena**, 1st Edition, Wm. C. Brown, 1992

Douglas College, **Physics 104 Laboratory Experiments**

Complete Form with Entries Under the Following Headings:

O. Course Objectives; P. Course Content; Q. Method of Instruction;

R. Course Evaluation

O. Course Objectives:

1. The student will be able to

1.1) explain/define terms and quantities encountered: scalar, vector, resultant, vector component, equilibrium, mass, weight, force, free-body diagram, centre of gravity, torque, lever arm, displacement, speed, velocity, acceleration, free fall, friction, work, kinetic energy, potential energy, power, mechanical advantage, efficiency, angular displacement, angular velocity, angular acceleration, centripetal force, centripetal acceleration, density, pressure, fluid pressure, temperature, thermal energy, specific heat, latent heat, heat conduction, convection, radiation, electric charge, electrical conductor, insulator, electric field, electric potential difference/voltage, resistance, current, electromotive force;

1.2) identify the appropriate SI units for the quantities encountered;

1.3) state the major principles/laws encountered: first and second conditions for equilibrium. Newton's three laws of motion, law of universal gravitation, work-energy theorem, principle of conservation of energy, Archimedes principle, Coulomb's law, Ohm's law;

1.4) add vector quantities using the component (trigonometry) method;

1.5) apply the laws/principles to the solution of numerical problems encountered in the textbook and in the laboratory;

1.6) perform basic experiments in mechanics, heat and electricity and analyze the data obtained using appropriate graphing techniques, scientific notation, significant figures and experimental uncertainty considerations.

P. Course Content

1) Mechanics
   - 1.1) physical quantities and SI units
   - 1.2) vectors versus scalars
   - 1.3) vector addition
   - 1.4) first condition for equilibrium with applications
   - 1.5) torque and lever arm
   - 1.6) second condition for equilibrium with applications
   - 1.7) velocity and acceleration
   - 1.8) uniformly accelerated motion
   - 1.9) gravitation
   - 1.10) Newton's laws of motion
   - 1.11) friction
   - 1.12) work, energy and power
   - 1.13) conservation of energy
   - 1.14) simple machines
   - 1.15) rotational motion
   - 1.16) centripetal force and acceleration
   - 1.17) density
   - 1.18) pressure
   - 1.19) Archimedes' principle

2) Heat
   - 2.1) temperature and thermometers
   - 2.2) thermal energy and heat capacity
   - 2.3) latent heats and phase changes
   - 2.4) heat transfer mechanisms

3) Electricity
   - 3.1) electric charge
   - 3.2) Coulomb's law
   - 3.3) electric field
   - 3.4) potential difference
   - 3.5) current
   - 3.6) resistance and Ohm's law
   - 3.7) electric power
   - 3.8) simple circuit analysis

Q. Method of Instruction

Classroom time will be divided between the presentation and discussion of basic concepts on the one hand and the application of these concepts in problem solving (working through examples and problems) on the other, with the majority of time devoted to the latter. The laboratory program will involved weekly, three hour sessions during which students will perform a set number of experiments.

R. Evaluation

The final grade assigned for the course will be based upon the following components:

1) final examination - maximum 30%
2) tests - minimum three administered during the semester
   - minimum 45% / maximum 50%
3) submitted laboratory reports - minimum 20% / maximum 25%