



Division: INSTRUCTIONAL

DATE: May 27, 1997

Department: SCIENCE & TECHNOLOGY

New Course:

Revision of Course Information form: X

DATED: 30 May, 1996

C: <u>PHYS 210</u> Subject & Course No.	D: <u>Electromagnetism, Optics, Modern Physics</u> Descriptive Title	E: <u>5</u> Semester Credit
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F: Calendar Description

This is a calculus based course. Topics include electrostatics; capacitance direct current circuits; magnetic force and field; electromagnetic induction; ac circuits; wave nature of light; geometric optics; interference and diffraction; elements of quantum, atomic and nuclear physics.

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	<u>4</u> Hrs.
Laboratory	<u>3</u> Hrs.
Seminar	_____ Hrs.
Clinical Experience	_____ Hrs.
Field Experience	_____ Hrs.
Practicum	_____ Hrs.
Shop	_____ Hrs.
Studio	_____ Hrs.
Student Directed Learning	_____ Hrs.
Other	_____ Hrs.
TOTAL	<u>7</u> HOURS

H: Course Prerequisites:
PHYS 110 (or PHYS 107
with A or B grade) and MATH 120

I: Course Corequisites:
MATH 220 should be taken concurrently

J: Course for which this course
is a pre-requisite
PHYS 321, 322, 420, 421

K: Maximum Class Size:
36

L: College Credit Transfer X
College Credit Non-Transfer _____

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

U.B.C. PHYS 102(3)
S.F.U. PHYS 121(3) plus 131(2)
U. Vic. with 110, PHYS 112(3) or PHYS 100
level(1.5)

OTHER:

COURSE DESIGNER(S) [Signature]

DEAN [Signature]

VICE PRESIDENT (INSTRUCTION) [Signature]

REGISTRAR [Signature]

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

Halliday, D., R. Resnick, & Walker, G. Fundamentals of Physics, Fourth Edition, Wiley, 1992

Douglas College, Physics 210 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:

The student will:

- 1) demonstrate an understanding of the basic principles and laws of electromagnetism, optics and elementary modern physics;
- 2) be able to apply the theory to the solution of problems in these areas and to the development of equations required to describe particular examples not covered formally in the classroom;
- 3) perform laboratory experiments and analyze the data obtained using appropriate graphing techniques, scientific notation, significant figures, and experimental uncertainty consideration;
- 4) be able to write formal laboratory reports in the conventional format required for submissions to journals in physics.

P. Course Content:

1. **Electricity and Magnetism:**
 - Electrostatic force and field
 - Gauss' Law
 - Electric potential
 - Capacitance and dielectrics
 - Direct current circuits
 - Magnetic force
 - Biot-Savart law and Ampere's law
 - Electromagnetic induction
 - Magnetic properties of materials
 - ac circuits

P. Course Content continued.....

2. **Optics:**
 - Wave nature of light
 - Reflection and refraction
 - Geometric optics
 - Interference and diffraction
 - Polarization
3. **Modern Physics:**
 - Quantum physics
 - Atomic physics
 - Nuclear physics
4. **Laboratory Experiments:**
 - Charged Particles in an Electric Field
 - Resistance Measurements
 - Kirchhoff's Rules for Circuit Analysis
 - Oscilloscope Applications
 - Moving Charge in a Magnetic Field
 - Thin Lenses
 - The Spectrometer
 - Wavelength Determinations
 - Wave Optics
 - Radioactivity
 - Atomic Constants

Q. Method

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 contained in the textbook) on the other, with the majority of time devoted to the latter. The laboratory program will involve weekly three hour sessions during which students will perform a set number of experiments.

R. Course Evaluation

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

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