Douglas College

EFFECTIVE: SEPTEMBER 2002

CURRICULUM GUIDELINES

A: Division: **Instructional**

B: Department/ Program Area: **Science and Technology**

Date: **07 January 2002**

New Course [ ]

Revision [X]

If Revision, Section(s) Revised: **F,H,L,N,P,Q**

Date Last Revised: **27 May 1997**

C:	**D:**	**E:**
PHYS 207	**Introductory General Physics II**	**5**
Subject & Course No.	Descriptive Title	Semester Credits

F: Calendar Description: This is a non-calculus based course. Topics include geometric optics; interference, diffraction, and polarization of light; electrostatics; direct current circuits; magnetic force and field; electromagnetic introduction; temperature; thermal properties of matter; gas laws; laws of thermodynamics.

G: Allocation of Contact Hours to Types of Instruction/Learning Settings

Primary Methods of Instructional Delivery and/or Learning Settings:

Lecture/Laboratory

Number of Contact Hours: (per week / semester for each descriptor)

7 hours

Number of Weeks per Semester:

14 weeks

H: Course Prerequisites:

PHYS 107 or equivalent

I. Course Corequisites:

J. Course for which this Course is a Prerequisite:

with 107 serves as prerequisite for PHYS 321, 322, 420 and 421

K. Maximum Class Size:

36

L: PLEASE INDICATE:

[ ] Non-Credit

[ ] College Credit Non-Transfer

[X] College Credit Transfer: Requested [X] Granted [X]

SEE BC TRANSFER GUIDE FOR TRANSFER DETAILS (www.bccat.bc.ca)

College Credit Transfer: Requested (SFU); Granted (UBC;UVic)

SFU SFU PHYS 100 (3) & SFU PHYS 130 (2); DOUG PHYS 107 & DOUG PHYS 207 = SFU PHYS 101 (3), SFU PHYS 102 (3), SFU PHYS 130 (2) and SFU PHYS (2)

UBC DOUG PHYS 107 & DOUG PHYS 207 = UBC PHYS 100 (3) & UBC PHYS (3). Exempt UBC PHYS 101. No credit if taken alone.

UVIC UVIC PHYS (1.5) 100 lev; DOUG PHYS 107 & PHYS 207 = UVIC PHYS 102 (3).

M: Course Objectives/Learning Outcomes

The student will be able to:

1) identify the following quantities and their SI units (where applicable): wavelength, frequency, velocity, index of refraction, focal length, radius of curvature, magnification, electric charge, force, electric field, potential, potential difference, capacitance, permittivity, dielectric constant, electromotive force, current, resistance, resistivity, power, energy, time constant, magnetic field, torque, permeability, magnetic flux, temperature, coefficient of expansion, pressure, volume, mass, mole, gas constant, molecular mass, Avogadro's number, heat, specific heat, latent heat, thermal conductivity, internal energy, work, efficiency.

2) demonstrate an understanding of the following concepts, procedures, and principles through the solution of problems: law of reflection; law of refraction/Snell's law; total internal reflection; mirror equation; lens makers equation; thin lens equation; constructive and destructive interference with light waves; Brewster's law; Rayleigh's criterion; Coulomb's law; vector addition via components; electric field; electric potential energy, potential, and potential difference; charged particle motion in electric field; capacitance; capacitor combinations; energy storage in capacitors; electric current; Ohm's law; resistance and resistivity; electric energy and power; resistor combinations; Kirchhoff's rules; capacitor charging; magnetic force on moving charge; magnetic force on current carrying conductor; torque on a current loop; Ampere's law; Faraday's law; Lenz's law; motional emf; thermal expansion of solids and liquids; gas laws; heat capacity; phase change; conservation of energy; calorimetry; heat transfer via conduction; first law of thermodynamics; thermodynamic processes; efficiency; Camot cycle; entropy.

3) perform laboratory experiments and analyze the data obtained using appropriate graphing techniques, scientific notation, significant figures, and experimental uncertainty consideration;

4) write a formal laboratory report in the conventional format required for submissions to scientific journals.

N: Course Content

1. Light:
   wave nature of light, reflection and refraction, mirrors and lenses, interference and diffraction; polarization of light.
2. Electricity and Magnetism:
   electrostatic force and field; electric potential; capacitance; direct current circuit elements; direct current circuit analysis; magnetic force and field; magnetic force applications; Ampere's law; direct current meters; electromagnetic induction; generators;
3. Heat:
   temperature and thermometers; thermal expansion of solids and liquids; Gas Laws; heat capacity and latent heats; heat transfer; thermodynamics
4. Laboratory experiments:
   the spectrometer; wavelength determinations; thin lenses; wave optics; charged particles in an electric field; electric circuits and resistance measurements; Kirchhoff's rules and circuit analysis/capacitance; radioactivity; motion of charged particles in a magnetic field; introduction to the oscilloscope; electromagnetic induction; thermal linear expansion of solids; heating effect of an electric current/conservation of energy.

O: Methods of Instruction

Classroom time will be divided between the presentation and discussion of concepts on the one hand and the application of these concepts in problem solving 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.

P: Textbooks and Materials to be Purchased by Students

Cutnell, J.D. and K.W. Johnson; Physics, Fifth Edition, Wiley, 2001
Douglas College; Physics 207 Laboratory Experiments

Q: Means of Assessment

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

a) final examination - minimum of 30%/ maximum of 40%
b) minimum of two tests administered during the semester - minimum of 40%/ maximum of 50% and
c) submitted laboratory reports - 20%

R: Prior Learning Assessment and Recognition: specify whether course is open for PLAR

Not open for PLAR.

Course Designer(s)	Education Council/Curriculum Committee Representative
Dean/Director	Registrar