Douglas College

EFFECTIVE: JANUARY 2004
CURRICULUM GUIDELINES

A. Division: Instructional

Effective Date: January 2004

B. Department / Program Area: Science and Technology

Revision [X] New Course [ ]

If Revision, Section(s) Revised: F,M,N,O,P,Q
Date of Previous Revision: May 27, 1997
Date of Current Revision:

C: PHYS 104 **D**: Practical Physics **E:** 5

Subject & Course No.	Descriptive Title	Semester Credits

F: Calendar Description:
This course is intended for students who have not taken Physics previously or who have taken some secondary school Physics and want a review. It can serve as one of the prerequisites for the university transfer course, PHYS 107. It is recommended that Math 110 or equivalent be taken concurrently. The areas to be covered are mechanics (one and two dimensional motions; rectors; rotational motion; simple machines; work, energy, and power; momentum; equilibrium; Hooke's law; collisions; circular motion; hydrostatics), heat (thermometry; heat transfer; thermal properties of matter), and electricity (electrostatics; direct current concepts and basic circuits).

G: Allocation of Contact Hours to Type 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)

4/3 per week

Number of Weeks per Semester:
15

H: Course Prerequisites:
BC Principles of Math 11 (C or higher)

I: Course Corequisites:

J: Course for which this Course is a Prerequisite

K: Maximum Class Size:
36

L: PLEASE INDICATE:

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

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

M: Course Objectives / Learning Outcomes

Upon completion of the course the student will be able to:

1. explain/define terms and quantities encountered: displacement, velocity/speed, acceleration, free-fall, scalar, vector resultant, vector component, equilibrium, mass, weight, force, free body diagram, center of gravity, torque, lever arm, friction, work, kinetic energy, potential energy, power, mechanical advantage, momentum, impulse, moment of inertia, 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.
2. identify the appropriate SI units for the quantities encountered.
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, principles of conservation of energy and momentum, Archimedes' principle, Coulomb's law, Ohm's law.
4. add vector quantities using the geometric and component (trigonometry) methods.
5. apply the laws/principles to the solution of numerical problems encountered in the textbook and in the laboratory.
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.

N: Course Content

1. **Mechanics**
   - physical quantities and SI units
   - velocity and acceleration
   - uniformly accelerated motion
   - gravitation
   - Newton's laws of motion
   - vectors versus scalars
   - vector addition
   - first condition for equilibrium
   - torque and lever arm
   - second condition for equilibrium
   - friction
   - work, energy and power
   - conservation of energy
   - simple machines
   - momentum and impulse
   - rotational motion
   - centripetal force and acceleration
   - density
   - pressure
   - Archimedes' principle
2. **Heat**
   - temperature and thermometers
   - thermal energy and heat capacity
   - latent heats and phase changes
   - heat transfer mechanisms
3. **Electricity**
   - electric charge
   - Coulomb's law
   - Electric field
   - Potential difference
   - Current
   - Resistance and Ohm's law
   - Electric power
   - Simple circuit analysis

O: Methods 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 involve weekly, three hour sessions during which students will perform a set number of experiments. This course involves some group work.

P: Textbooks and Materials to be Purchased by Students

L.A. Bloomfield, How Things Work: The Physics of Everyday Life, 2nd Edition, Wiley, 2001
Douglas College, Physics 104 Laboratory Experiments

Q: Means of Assessment

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

a) final examination – minimum of 30%/maximum of 40%
b) two tests administered during the semester – minimum of 15% each/maximum of 25% each
c) submitted laboratory reports – 20%
d) quizzes, assignments – maximum of 10%

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