Douglas College

EFFECTIVE: SEPTEMBER 2004
CURRICULUM GUIDELINES

A.	Division:	**Education**	Effective Date:		**September 2004**	
B.	Department / Program Area:	**Science and Technology Physics**	Revision	**X**	New Course	
			If Revision, Section(s) Revised:		**C, H, J, P**	
			Date of Previous Revision:		**07 January 2002**	
			Date of Current Revision:		**September 2004**	

C: **PHYS 1107** **D**: **Introductory General Physics I** **E:** **5**

Subject & Course No.	Descriptive Title	Semester Credits

F: Calendar Description:

This is a non-calculus based course in mechanics. Topics include: vectors; particle kinematics and dynamics; work, energy and power; linear momentum; rotational motion; statics; vibratory motion; simple harmonic motion; waves; sound.

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)

7

Number of Weeks per Semester:

15

H: Course Prerequisites:

BC Principles of Math 12 (C or higher) & either Physics 11 (C or higher) or PHYS 1104

I: Course Corequisites:

none

J: Course for which this Course is a Prerequisite

PHYS 1207 OR PHYS 1210

K: Maximum Class Size:

36

L: PLEASE INDICATE:

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

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

M: Course Objectives / Learning Outcomes

1. Identify the following mechanical quantities and their SI units:
   displacement, velocity, speed, acceleration, force, mass, weight, friction, torque, work, translational kinetic energy, gravitational potential energy, power, linear momentum, impulse, angular displacement, angular velocity, angular acceleration, moment of inertia, rotational kinetic energy, angular momentum, stress, strain, elastic modulus, pressure, amplitude of motion, period of motion, frequency, spring potential energy, wavelength, wave intensity, intensity level.

2. Demonstrate an understanding of the following concepts, procedures, and principles of mechanics through the solution of problems:
   2.1. vector addition via components
   2.2. average velocity and instantaneous velocity
   2.3. average acceleration and instantaneous acceleration
   2.4. uniformly accelerated motion
   2.5. free-fall motion
   2.6. Newton's laws of motion
   2.7. friction and coefficient of friction
   2.8. conditions for equilibrium
   2.9. work-energy theorem
   2.10. conservation of mechanical energy
   2.11. conservation of energy
   2.12. conservation of linear momentum
   2.13. centripetal acceleration and force
   2.14. universal law of gravitation
   2.15. Kepler's law
   2.16. rolling motion
   2.17. conservation of angular momentum
   2.18. elastic deformation of solids
   2.19. general form of Hooke's law
   2.20. Hooke's law for springs
   2.21. single harmonic motion
   2.22. wave parameters
   2.23. superposition principle
   2.24. resonance
   2.25. intensity level versus intensity of sound
   2.26. Doppler effect

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

4. Write a laboratory report in a conventional format required of submissions to scientific journals.

N: Course Content:

1. Mechanics
   1.1. Vectors and vector addition
   1.2. Velocity and acceleration
   1.3. Uniformly accelerated motion in one dimension
   1.4. Projectile motion
   1.5. Newton's laws of motion
   1.6. Friction
   1.7. Objects in equilibrium
   1.8. Work and energy
   1.9. Linear momentum and collisions
   1.10. Circular motion kinematics
   1.11. Centripetal force
   1.12. Rotational dynamics

Continued….

2. Properties of Matter & Waves
   - 2.1. Elastic properties of solids
   - 2.2. Hooke's law
   - 2.3. Simple harmonic motion
   - 2.4. Mechanical wave characteristics
   - 2.5. Standing waves
   - 2.6. Sound wave intensity
   - 2.7. Doppler effect
3. Laboratory experiments
   - 3.1. Composition of Forces/Static Equilibrium
   - 3.2. Uniformly Accelerated Motion
   - 3.3. Projectile Motion
   - 3.4. Simple Pendulum/Determination of Gravitational Acceleration
   - 3.5. Friction
   - 3.6. Collisions
   - 3.7. Orbital Motion and Centripetal Force
   - 3.8. Moment of Inertia
   - 3.9. Hooke's Law and Simple Harmonic Motion
   - 3.10. Standing Traverse Waves
   - 3.11. Resonant Air Columns/Speed of Sound in Air

O: Methods of Instruction

Classroom time will be divided between the presentation and discussion of concepts in mechanics 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 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

Cutnell, J.D. and K.W. Johnson: Physics, Fifth Edition, Wiley, 2001

Douglas College, Physics 1107 Laboratory Experiments.

Q: Means of Assessment

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

a) final examination – minimum 30% / maximum of 40%
b) at least two tests administered during the semester – minimum 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