Common Course Outline
PHYS 151
General Physics I
3 Semester Hours

The Community College of Baltimore County

Description

PHYS 151--3 Credits--General Physics I includes Newtonian mechanics, kinematics and dynamics of translational, rotational and simple harmonic motions, momentum, energy and gravitation; serves as the first course in a set of three calculus-based courses in the basic principles of physics for students who plan to major in engineering, mathematics or physical sciences. While there is no formal laboratory, as the second and third courses have, an occasional laboratory "investigation" may be assigned.

3 credits: 3 lecture hours per week and 2 recitation hours per week

Prerequisites: MATH 251 and high school physics or PHYS 101

Overall Course Objectives

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

1. solve problems analyzing uniformly accelerated motion; (I, III, VI), (1, 2, 3)
2. apply Newton's Laws of Motion to problems of force analysis; (I, III, VI), (1, 2, 3)
3. analyze circular motion; (I, III, VI), (1, 2, 3)
4. apply Newton's Law of Universal Gravitation; (I, III, V, VI), (1, 2, 3, 4, 5)
5. solve the Conservation of Energy condition in mechanical systems; (I, III, VI), (1, 2, 3)
6. apply the Conservation of Linear Momentum for collision analysis; (I, III, VI), (1, 2, 3)
7. analyze rotational motion; (I, III, VI), (1, 2, 3)
8. apply force and torque analysis to static systems; (I, III, VI), (1, 2, 3)
9. solve the elementary equation of motion of the simple harmonic oscillator; (I, III,VI), (1, 2, 3)
10. perform vector addition by the graphical and component methods; (I, III, VI), (1, 2, 3)
11. execute vector scalar product and vector product operations; (I, III,VI), (1, 2, 3)
12. describe the merits of collaborative learning if projects and/or investigations are assigned; (II, III, VI), (1, 2, 3, 4, 6)
13. discuss the universal applicability of the laws of physics making them the

intellectual property of all cultures and segments of humankind; and (I, V), (4, 7)

Major Topics

I. Measurement
II. Motion in One-Dimension
III. Vectors
IV. Motion in Two and Three Dimensions
V. Force and Newton's Laws
VI. Particle Dynamics
VII. Work and Energy
VIII. Conservation of Energy
IX. Systems of Particles
X. Collisions
XI. Rotational Kinematics
XII. Rotational Dynamics
XIII. Angular Momentum
XIV. Equilibrium of Rigid Bodies
XV. Oscillations
XVI. Gravitation

Course Requirements

Grading/exams: Grading procedures will be determined by the individual faculty member but include the following: a minimum of three examinations, quizzes, and a final examination.

Writing: Individual faculty member will determine specific writing assignments.

Other Course Information

This course may be used to fulfill three credits of the General Education requirement in Biological and Physical Sciences.
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This course is the first course in a three-course set.

Individual faculty members may include additional course objectives, major topics, and other course requirements to the minimum expectations stated in the Common Course Outline.

Date Revised: 3/26/07