PHYS 105
How Things Work
3 Credits

Community College of Baltimore County
Common Course Outline

Description

PHYS 105 – How Things Work: uses a conceptual approach to present selected physics topics. Topics will include the scientific method, motion, matter, heat, sound, electricity and magnetism, and optics. For students needing a lab, PHYS 111 serves as the accompanying lab.

Pre-requisites: (ESOL 052 and ESOL 100) and MATH 082

Overall Course Objectives

Upon completion of this course, students will be able to:

1. apply the concepts of linear motion to problems involving speed, velocity, and acceleration;
2. analyze projectile motion in terms of vectors;
3. solve problems using Newton's Laws;
4. apply conservation of linear momentum to problems using real life examples;
5. differentiate between work and energy;
6. solve real life examples involving work and energy;
7. apply concepts of rotational inertia, torque, and forces to solve problems of rotational motion;
8. use Kepler's laws to explain the motion of the planets around the Sun;
9. distinguish between the three states of matter and the properties that apply to them;
10. describe the principles involved in the transfer of heat;
11. interpret rays of light experiencing reflection versus refraction;
12. identify the characteristics of a sound wave;
13. relate the principles of electricity & magnetism to everyday life;
14. discuss how developments in physics and the global community have influenced each other and how they have adapted over time;
15. distinguish between principles related to physics which are evidence-based versus non-evidence based;
16. describe physics information using effective written and/or oral communications;
17. find, evaluate, use, and cite informational resources to research physics topics;
18. evaluate professional behavior within the scientific community and the ramifications of misconduct;
19. draw conclusions about questions in physics using data obtained from appropriate technological resources;
20. connect physics principles with the methods of experimentation through which they were derived;
21. apply general physics concepts to new situations; and

22. describe the universal applicability of the laws of physics, making them the intellectual property of all cultures and segments of humankind.

Major Topics

I. Motion
II. Force
III. Momentum
IV. Energy
V. Rotational Motion
VI. Matter
VII. Sound
VIII. Optics
IX. Electricity
X. Magnetism
XI. Heat
XII. Global Developments in Physics

Course Requirements

Grading will be determined by the individual faculty member, but shall include the following, at minimum:

- four exams, one of which may be the final exam
- five homework assignments and/or activities; activities may be collaborative
- one assignment/activity will assess General Education Outcomes and be worth 10% of the course grade
- Extra credit in this course can increase a student's percentage grade by no more that 2%

Written assignments: Students are required to use appropriate academic resources.

Other Course Information

This course is an approved 3-credit General Education course in the Biological and Physical Sciences category that does not fulfill the laboratory requirement. Successful completion of this course and the companion laboratory, PHYS111, fulfills the laboratory requirement and equals 4 credits. Please refer to the current CCBC Catalog for General Education course criteria and outcomes.

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