

# Common Course Outline

## PHYS 105

### How Things Work

3 Credits

## Community College of Baltimore County

### 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 & magnetism, and optics.

### 3 Credits

**Prerequisites:** ACLT 052 or ACLT 053 or (ESOL 052 and ESOL 054) 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 and do simple calculations for projectiles;
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 and solve real life examples involving work and energy;
6. apply concepts of rotational inertia, torque, and forces to solve problems of rotational motion;
7. use Kepler's laws to explain the motion of the planets around the Sun;
8. distinguish between the three states of matter and the properties that apply to them;
9. describe the principles involved in the transfer of heat;
10. sketch rays of light experiencing reflection versus refraction;
11. identify the characteristics of a sound wave;
12. relate the principles of electricity & magnetism to everyday life;
13. discuss how developments in physics and the global community have influenced each other and how they have adapted over time;
14. distinguish between principles related to physics which are evidence-based versus non-evidence based;
15. describe physics information using effective written and/or oral communications;
16. find, evaluate, use, and document informational resources to research physics topics;
17. evaluate professional behavior within the scientific community and explain the ramifications of misconduct;
18. draw conclusions about questions in physics using data obtained from appropriate technological resources;

19. link physics principles with the methods of experimentation through which they were derived;
20. apply general physics concepts to new situations; and
21. value 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 procedures will be determined by the individual faculty member but will include the following:

### **Grading/exams**

- A minimum of four exams, one of which may be the final exam
- A minimum of five homework assignments and/or activities; activities may be collaborative
- Attendance will be taken each class period as per college policy, but no points will be rewarded solely for attendance. However, assignments may be given that can only be completed within a certain class period.
- The total extra credit given in this course can increase a student's percentage grade by no more than two percentage points.
- Multiple assessments will infuse CCBC General Education program objectives.

Written Assignments: Students are required to use appropriate academic resources. Multiple assignments will infuse CCBC General Education Program objectives; at least one assignment worth a minimum of 5% of the total course grade will allow students to demonstrate at least 5 of the 7 General Education Program outcomes.

### **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.

Date revised: 11/06/2018