

## **PHYS 102**

### **Fundamentals of Physics II**

4 Credits: 3 Lecture hours and 3 Laboratory hours per week

Community College of Baltimore County  
Common Course Outline

#### **Description**

**PHYS 102 – Fundamentals of Physics II:** continues with the basic principles of physics for students who are not expecting to major in engineering or the physical sciences. Topics include electricity and magnetism, optics, and selected topics from modern physics.

**Pre-requisites: PHYS 101**

**Co-requisites:** Remove if empty

#### **Overall Course Objectives**

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

1. Apply Coulomb's Law of electrostatic force. (I, III), (1, 2, 3);
2. Solve problems of force and motion in electric fields. (I, III, IV, VI), (1, 2, 3);
3. Apply energy concepts to electrostatic potential. (I, III), (1, 2, 3);
4. Analyze elementary DC circuits with Ohm's and Kirchhoff's Law. (I, III). (2, 3, 4, 6);
5. Apply the Lorentz magnetic force laws. (I, III), (1, 2, 3);
6. Solve problems of magnetic induction, Faraday's Law and Lenz's Law. (I, III, IV, VI), (1, 2, 3);
7. Analyze elementary RLC AC series circuits. (I, III). (2, 3, 4, 6);
8. Solve problems of reflection and refraction of light. (I, III, IV, VI), (1, 2, 3);
9. Analyze the optics of lenses and spherical mirrors. (I, III), (2, 3, 4);
10. Analyze lens systems with the lens equation and the Lens Makers equation. (I, III), (2, 3, 4);
11. Solve problems involving the application of the concepts presented to practical situations in our and other societies. (III, IV, V), (1, 5, 7); and
12. Write coherent and presentable laboratory reports. (II, III, V, VI), (2, 4, 5, 6, 7).

#### **Major Topics**

- I. Electric Charge and Electric Field
- II. Electric Potential and Electric Energy; Capacitance
- III. Electric Current
- IV. DC Circuits
- V. Magnetism
- VI. Electromagnetic Induction and Alternating Current
- VII. Electromagnetic Waves
- VIII. Light: Geometric Optics
- IX. Wave Optics
- X. Optical Instruments

The Common Course Outline (CCO) determines the essential nature of each course.

For more information, see your professor's syllabus.

- XI. Topics in Modern Physics Selected From
- a. Special Theory of Relativity
  - b. Atomic Physics
  - c. Quantum Mechanics
  - d. Nuclear Physics
  - e. Molecules and Solids
  - f. Elementary Particles
  - g. Astrophysics
  - h. Cosmology

### **Course Requirements**

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

- Three examinations
- Quizzes
- Final Examination
- Laboratory Reports (Written Laboratory Reports will be required on a more or less weekly basis)

Written assignments and research projects: Students are required to use appropriate academic resources in their research and cite sources according to the style selected by their professor.

### **Other Course Information**

This course is a General Education core course and a Biological and Physical Sciences elective.

This course is the second course in a two-course sequence.

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: 10/28/2003