

# Common Course Outline

## PHYS 251

### General Physics II

4 Semester Hours

## The Community College of Baltimore County

### Description

**PHYS 251--4 Credits--General Physics II** includes electricity and magnetism, kinetic theory, thermodynamics, thermal energy and heat transfer; builds on PHYS 151 toward a three-semester set of calculus-based courses in the basic principles of physics for students who plan to major in engineering, mathematics or physical sciences.

**4 credits: 3 lecture hours per week, 1 recitation hour per week, and 3 laboratory hours per week**

**Prerequisites: PHYS 151 and MATH 252(corequisite/prerequisite)**

### Overall Course Objectives

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

1. solve problems analyzing thermal properties; (I,III,IV,VI) (1,2,3)
2. apply laws of thermodynamics to problem solving; (I,III) (1,2,3)
3. analyze laws of thermodynamics; (I,III) (2,3,4)
4. solve problems using electric field and electric potential laws; (I,III,IV,VI) (1,2,3)
5. analyze electrical circuits; (I,III) (2,3,4,6)
6. analyze laws of electromagnetic induction and apply these laws to problem solving; (I,III) (2,3,4)
7. solve problems involving the application of the concepts presented to practical situations in our and other societies; and (III,IV,V) (1,5,7)
8. write coherent and presentable laboratory reports. (II,III,V,VI,VII) (2,4,5,6,7)

### Major Topics

- I. Temperature and Heat
- II. Thermal Properties of Matter
- III. The First Law of Thermodynamics
- IV. The Second Law of Thermodynamics
- V. Electric Charge and Electric Field
- VI. Gauss's Law
- VII. Electric Potential
- VIII. Capacitance and Dielectrics

- IX. Current, Resistance, and Electromotive Force
- X. Direct-Current Circuits
- XI. Magnetic Field and Magnetic Forces
- XII. Sources of Magnetic Field
- XIII. Electromagnetic Induction
- XIV. Inductance

### **Course Requirements**

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

Writing: Written laboratory reports will be required on a more or less weekly basis.

### **Other Course Information**

This lab course may be used to fulfill four credits of the General Education requirement in Biological and Physical Sciences.

This course is part of 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.

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