

PHY 252 – Fundamentals of Physics II Syllabus

Credit

4 semester hours

3 hours of lecture per week, 3 hours of lab per week

Prerequisites

PHY 251 (First semester calculus based physics)

Course Description

Light, electricity, and magnetism presented with the aid of calculus.

Rationale for Course

Physics is the study of the physical phenomena that we observe in our universe. It is broad ranging and essential to all the sciences. This course aims to introduce the fundamental concepts of physics, focusing primarily on the areas of electricity, magnetism, and optics. Students will develop problem solving skills, learning how to logically approach and evaluate a variety of physical situations.

Learning Objectives

- The student will understand electrostatic phenomena using classical electric field theory and will be able to analyze electrostatic problems using classical principles.
- The student will understand the behavior of electrical circuits and will be able to analyze electrical circuits using Ohm's law and Kirchhoff's laws.
- The student will understand magnetostatic phenomena using classical magnetic field theory and will be able to analyze magnetostatic problems using classical principles.
- The student will understand electromagnetic induction phenomena and will be able to analyze physical situations involving induced electromotive forces.
- The student will understand physical and geometrical optical phenomena based on classical optical theory and will be able to analyze optics problems using classical principles.

Academic Integrity

Students are expected to be honest and to submit their own work on exams and research papers. Strict adherence to the Mississippi College "Honesty Policy" (*2010-2011 Mississippi College Undergraduate Bulletin, pg. 60*) will be followed.

Course Outline

- Electric Charge and Electric Field
- Gauss's Law
- Electric Potential
- Capacitance and Dielectrics
- Current, Resistance, and Electromotive Force
- DC Circuits
- Magnetic Fields and Forces
- Sources of Magnetic Field
- Electromagnetic Induction

- Alternating Current
- Electromagnetic Waves
- Optics

Method of Instruction

Class will consist primarily of presenting fundamental physics concepts, working problems, and discussing in-class demonstrations. Key points will be highlighted by the choice of examples, and these points will be discussed in the context of the example.

Required Text and Materials

University Physics with Modern Physics, 12th Edition, by Young and Freedman. In addition to the text, you will need a scientific calculator and a laboratory data notebook. General procedures for lab experiments can be found online at http://www.mc.edu/academics/departments/physics/lab_information/. You are expected to have the laboratory procedures printed out and previewed before you come to lab. It may also be beneficial to bring a set of colored pencils to lecture and lab. Figures shown on the board are often drawn in multi-color for clarity, so it is recommended that the illustrations in your notes take advantage of this capability as well.

Grading

The final average will be computed as follows: 60% will be from lecture tests, 20% from lab, and 20% from the final exam. The final exam is comprehensive. Lab points will be determined based on lab report grades (see Lab Policies and Procedures handout).

Scale:	Grade	Final Average
	A	90–100
	B	80–89
	C	70–79
	D	60–69
	F	0–59

Makeup Tests

Makeup tests will be given only under the following circumstances:

- Consent of the instructor has been obtained prior to the test.
- An excused absence is obtained from a doctor or the Vice-President for Academic Affairs

Absences

Mississippi College policies on attendance and academic integrity will be enforced. Please see the *2010–2011 Mississippi College Undergraduate Bulletin*, pg. 56–57 for additional details of these policies. Students are responsible for all work missed during an absence.

Special Needs

If you need special accommodations due to learning, physical, psychological, or other disabilities, please contact the Counseling and Career Development Center (601–925–3354).