

PHYS 241 - Physics for Scientists & Engineers 3 Course Outline

Approval Date: 11/08/2013

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SECTION A

Unique ID Number CCC000192628

Discipline(s)

Division Science and Engineering

Subject Area Physics

Subject Code PHYS

Course Number 241

Course Title Physics for Scientists & Engineers 3

TOP Code/SAM Code 1902.00 - Physics, General / -

Rationale for adding this course to the curriculum minor changes to language, clarifications, and additional text.

Units 4

Cross List N/A

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3. Course Content

- A. Wave Motion:
 - a. Types of waves
 - b. Superposition and interference of waves
 - c. Reflection and transmission of waves
 - d. Energy transmitted by sinusoidal waves on strings
- B. Sound Waves
 - a. Speed of sound waves
 - b. Periodic sound waves
 - c. Intensity of periodic sound waves
 - d. The Doppler effect
- C. Superposition and Standing Waves
 - a. Superposition and interference of sinusoidal waves
 - b. Standing waves
 - c. Resonance
 - d. Beats: Interference in time
- D. Electromagnetic Waves
 - a. Maxwell's equations and Hertz's discoveries
 - b. Plane electromagnetic waves
 - c. Energy carried by electromagnetic waves
 - d. The spectrum of electromagnetic waves
- E. The Nature of Light and the Laws of Geometric Optics

meaning.

The laboratory is a large portion of your PHYS 240 grade. In fact, the lab accounts for 30% of the total grade. Hence, it is important to make sure that you meet the entire requirement on every lab. Please ask for assistance and/or any clarification.

The lab work is done by teams and it is acceptable for students to do analysis together but the laboratory report is to be your own work. Laboratory reports from group members that are identical or essentially identical will be treated as a single report and the points awarded to each member will be graded as one report and the points will be split among the students violating this rule. The very best grade you can get if you do not do your own work is 50%.

You are expected to obtain a copy of the laboratory instructions for each week and study them before coming to the laboratory class. This preparation will enhance your learning experience. In order to encourage you to do your preparation, there will be occasional quizzes covering the procedure for the current lab experiment. It is your responsibility to obtain a copy of the laboratory instructions before you come to the lab. Copies will not be available at the laboratory during the lab session.

C. Other Assignments

Homework Problems

Sample Problem 1:

One of the beams of an interferometer passes through a small evacuated glass container 1.155 cm deep. When a gas is allowed to slowly fill the container, a total of 187 dark fringes are counted to move past a reference line. The light used has a wavelength of 631.8 nm. Calculate the index of refraction of the gas at its final density, assuming that the interferometer is in vacuum.

Sample Problem 2:

How long must you wait (in half-

Author: Wilson, D.P., Hernandez, C.A.
Title: Physics Laboratory Experiments 8th edition
Publisher: Cengage Learning
Date of Publication: 01-03-2014

B. Other required materials/supplies.