

# PENSACOLA JUNIOR COLLEGE

## COURSE SYLLABUS

PHY 1054 General Physics II

TERM: Summer 2007

SECTION #: 1904 (M,W: 6:00 P.M. to 9:20 P.M. Room 1776)

INSTRUCTOR: Dr. J. Zayas OFFICE #: 9728 TEL. #: (850) 484-1104

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Catalog Description: A physics course emphasizing fundamental principles, practical applications and relevance to modern society. A continuation of PHY 1053. Major topics include the study of magnetism, electricity, light and elements of modern physics.

Prerequisite: Completion of PHY 1053 with a grade of "C" or better.

Co-requisite: PHY 1054L.

Required Textbook: Physics Principles and Applications, 6<sup>th</sup> Edition  
By Douglas C. Giancoli  
Pearson, Prentice-Hall Publisher

General Statement

By Instructor: The laws of physics are relatively few in number, but the myriad of different circumstances in which they may be applied shows that strict memorization is not the best procedure for learning the subject matter. Rather, the solution of numerous problems leads to a much better understanding of physics. Therefore, the student is advised to solve as many problems as possible in order to gain a deeper insight into the subject. **Students are also encouraged to work in groups.** This technique usually leads to more material being covered with greater overall understanding.

Course Objectives: Upon completion of the course, the student will be able to:

- 1) Write down and know the meaning of all terms in Coulomb's Law.
- 2) Calculate the magnitude and direction of the electric field due to several charges.
- 3) Give a qualitative explanation of the differences between conductors, insulators, semi-conductors and superconductors.
- 4) Find the electric potential due to several point charges.
- 5) Analyze simple DC and AC circuits and find the current flowing through any particular element.
- 6) Use Ohm's Law to find the electric potential between any two points in a simple circuit.
- 7) Compute the electric power delivered by a source of emf, such as a battery.
- 8) Find the equivalent resistance of several resistors connected in series and/or parallel.
- 9) Find the equivalent capacitance of several capacitors connected in series and/or parallel.
- 10) Determine the electrical energy stored in a charged capacitor.
- 11) Predict the effect of a magnetic field on moving charges or on electric currents flowing through wires.
- 12) Find the magnitude and direction of the magnetic field produced by a constant current flowing through a long straight wire using the Biot-Savart Law.
- 13) Compute the magnetic field of a solenoid.
- 14) Determine the induced emf in a circuit where the magnetic flux is changing by applying Faraday's Law of electromagnetic induction.
- 15) Find the self-inductance of a solenoid.
- 16) Relate the electric and magnetic fields present in a plane polarized electromagnetic wave.
- 17) Find the impedance of a simple AC circuit.
- 18) Cite the laws of geometric optics.
- 19) Find the location of real and virtual images produced by spherical mirrors and lenses.
- 20) Explain the phenomenon of total internal reflection.
- 21) Describe the main properties and uses of polarized light.
- 22) Understand how thin-film interference techniques may be used for the measurement of minute distances.
- 23) Use a diffraction grating to measure the wavelength of a light source.
- 24) Understand the operating principles of microscopes and telescopes.
- 25) Describe the visible spectrum of Hydrogen.
- 26) Give an explanation of the photoelectric effect and how it applies to modern instruments as the photocell.
- 27) Describe how X-Rays are generated in a typical X-Ray tube.
- 28) Understand the wave nature of particles and the particle nature of radiation.
- 29) Find the deBroglie wavelength of a rapidly moving electron.

Grading Policy: Throughout the term, two full-period examinations will be given. These exams will consist of problems similar to those given at the end of each chapter and covered in class. The student will be expected to show all steps in the solution of each problem **with all reasoning clearly indicated**. A properly labeled diagram should appear whenever applicable. **Partial credit will be awarded in direct proportion to amount of correct work and reasoning shown**. A 2-hour final exam will also be given. Each student is allowed to **bring and 8 ½" X 11" formula sheet** to any exam, including the final exam. The main objective of this course is to teach students how to think analytically, rather than relying on memorization of formulas, etc. **The lowest grade of the 2 full-period exams will be dropped**. Credit will be given as follows:

Best one-hour exam: 65% of final grade  
2-hour final exam: 35% of final grade

Total:  $\overline{100\%}$

Withdrawal Policy: **A student may withdraw from the course and obtain a grade of W up to July 24, 2007**. Beyond that date, the instructor is required to assign a grade other than W for the course.

Tentative Exam Dates: Exam # 1: July 9, 2007  
Exam # 2: July 25, 2007

Final Exam: Aug 6, 2007

HOMEWORK PROBLEM ASSIGNMENT

Textbook: Physics Principles with Applications, 6<sup>th</sup> Edition

By Douglas C. Giancoli

Pearson/ Prentice-Hall Publishers

Chapter 16: 1,3,4,7,12,13,15,20,23,28,31,36,38,43,45,48,64,66,67

Chapter 17: 1,2,5,7,9,10,13,15,16,19,20,24,25,28,29,31,32,34,36,39,  
40,42,44,46,49,60,62,63,64,66,72

Chapter 18: 1,6,7,9,11,13,16,19,21,24,27,30,31,34,38,39,43,45,48,49,  
50,57,58,60,64,66,67,71,75,81

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EXAM # 1

Chapter 19: 1,3,6,10,11,14,15,17,23,25,27,32,34,37,41,46,50,51,53,55  
58,70,71,74,79,81,84

Chapter 20: 1,2,4,5,9,11,12,14,15,16,19,24,26,28,33,41,42,45,48,50,52,  
54,55,60,62,67,73,75,77,86

Chapter 21: 1,3,4,5,6,10,13,15,16,21,23,26,30,32,34,35,39,42,44,47,48,  
50,51,53,54,58,59,61,62,64,69,73,76,77,80,85,88

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EXAM # 2

Chapter 22:

Chapter 23:

Chapter 24:

Chapter 25:

Chapter 26:

Chapter 27:

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FINAL EXAM