

PHYSICS 251 SPRING 2008

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Class Schedule

- **Mon, Wed, and Fri, 12:00-12:50 AM**, Luerssen Room 125
- **Laboratory Begins Wed Jan. 23rd.**

Course Description

Algebra-based introduction to classical electricity and magnetism, optics, and areas of modern physics, including such topics electric charge and fields, electrical potential and energy, electric currents and resistance, direct current (DC) circuits, magnetism, electromagnetic induction and applications to devices, electromagnetic waves, light and geometrical optics, wave nature of light, basic optical instruments (microscopes, telescopes, etc.), basics of quantum mechanics, applications of quantum theory to atoms, molecules, and solids, nuclear physics and radioactivity, applications of nuclear energy and radiation.

Course Objectives

- This course is designed to provide students with a working knowledge of the elementary physics principles in Electricity and Magnetism and modern physics: as well as their applications to everyday phenomena.
- This course is designed to enhance your conceptual understanding of physical laws, and to *increase your problem solving abilities*, especially as applied to physical systems.
 - ★ You will continue to develop the tools to solve multi-step problems involving application of the physical laws presented in this course.
- The mathematical prerequisites for this course (and the prerequisite PHYS 250) are mathematics at the level of algebra and trigonometry, demonstrated by suitable coursework or demonstration of satisfactory performance on the mathematical proficiency exam.
- Students attend three lectures, and a two-hour lab/activity per week.
- Students perform laboratory experiments, discuss their results, and write up their conclusions in weekly lab reports. Course evaluation is based on a combination of homework, quizzes, lab reports, midterm and final exams, and other evaluative tools. The course is a continuation of the first-semester course, PHYS 250.

Course Materials: Text, Web-Assign-Homework Tool

- **TEXTBOOK:** PHYSICS, 6th Ed., GIANCOLI, Prentice Hall
- **Electronic Media-Learning Tools:**
 - ★ *Web Assign*TM Homework Assignment Tool: **Go to bookstore and purchase WebAssign card:** log onto www.webassign.com. See instructions on course website.
 - ★ Website of text: http://wps.prenhall.com/esm_giancoli_physicsppa_6
Content that appears on the Website invaluable resource for course: to endless amount of information.

Lectures

You are expected to attend class, and will be held responsible for all work covered in the lectures. I will assume that you have read the assigned material before coming to class. This will help you to assimilate the concepts and demonstrations as they are discussed in lecture.

Quizzes

From time to time, there may be short quizzes in class. *Quizzes will be based on lectures, assigned homework problems, and reading assignments.*

Homework

Homework is assigned on a regular basis. Specific problems and solutions will be interspersed throughout the lectures. You are expected to work every assigned problem. Your homework will be graded weekly through Web Assign.

- Group discussion and collaboration on solving homework problems are encouraged. **However, you will write up your homework solutions on your own and submit them using Web Assign. Copying the solution of your classmate will be considered a breach of the academic integrity code.**

Grading

- Three hourly exams— $3 \times 13\% \approx 40\%$
- Final Exam—20%
- Homework & Classwork—20%
- Laboratory—20%

Examinations

- All exams will be “closed book”. Bring a calculator to quizzes and examinations. You may bring *one 3 by 5 inch index card* containing only formulae to exams. *The formula card will be turned in with the exam.* Failure to restrict the card to formulae only will result in a failing grade for the exam. There are no makeups for these exams. If for any legitimate reason, e.g. illness, you cannot be present for an examination, **notify me PRIOR to the examination time!** *Doctor's certification will be required.*
- Final Exam: The final examination will take place during the final exam period in May 2008. This examination must be taken at the scheduled time unless you have three or more exams in a 24 hour period.

Academic Integrity and Honesty

- Academic integrity is the pursuit of scholarly activity in an open, honest and responsible manner. It is the basic guiding principle for all academic activity at Penn State. Consistent with this expectation, the University's Code of Conduct states that all students should act with personal integrity, respect other students' *dignity, rights and property, and help create and maintain an environment in which all can succeed through the fruits of their efforts.*
- Academic integrity includes a commitment not to engage in or tolerate acts of falsification, misrepresentation or deception. Such acts of dishonesty violate the fundamental ethical principles of the University community and compromise the worth of work completed by others. (**Senate Policy: 49-20**).
- Academic dishonesty includes but is not limited to cheating, plagiarism, fabrication of information or citation, prior possession of examinations submitting the work of another person or work previously used without informing the instructor, or tampering with the academic work of other students.
- *Failure to conform to the stated University policy during exams, quizzes and in homework will result in a 0 for the activity and possibly an F for the course.*

Tentative Schedule through Exam 1

The syllabus for the course (*which is subject to change*) is given below up to Spring Break. The first and second columns show the dates and chapter-subjects to be covered. Homework assignments are posted on the Web Assign Course page and are assigned weekly.

Date	Chapter	Problems
Jan 14	Ch 16-Electric Charge (1-10)	HW Webassign Weekly
Jan 16	Ch 16-Coulomb's Law	
Jan 18	Ch 16-Electric Fields	
Jan 21	Martin Luther King Day, no classes	
Jan 23	Ch 17-Electric Potential & E-Fields	
Jan 24	Ch 17-Capacitance	
	Lab-1: Electric Field Mapping <i>Labs start on Wed. Jan. 23</i>	
Jan 28	Ch 18-Electric Currents	
Jan 30	Ch 18-Resistance & Ohm's Law & 3-D	
Feb 1	Ch 18-cont.	
	Lab-2: Electric Field and Electric Potential	
Feb 4	Ch 19 DC Electric Circuits (1-7,9)	
Feb 6	Ch 19 Kirchoff's Laws	
Feb 8	Exam 1 covers (16-18)	
	Lab-3: Measurement of Resistance-Statistical Error	
Feb 11	Ch 20 Magnetic Fields (1-10,12)	
Feb 13	Ch 20-cont.	
Feb 15	Ch 20-cont.	
	Lab-4: Ohmic and Non-Ohmic Devices	
Feb 18	Ch 21 Electromagnetic Induction)	
Feb 20	Ch 21 Faraday's Law	
Feb 22	Ch 21 AC Circuits	
	Lab-5: RC Circuits and the Time Constant	
Feb 25	Ch 21-cont.	
Feb 27	Ch 22 Displacement Current	
Feb 29	Ch 22 Maxwell's Equations	
	Lab-6: Charge to Mass Ratio of the Electron	
Mar 3	Ch 22 Electromagnetic Waves	
Mar 5	Ch 23 Geometrical Optics (1-10)	
Mar 7	Exam 2 Covers (19-22)	
	Mirrors Demo	
Mar 10	Spring Break	
Mar 12	"	
Mar 14	"	
	No Lab	