

COLLEGE PHYSICS II - PH 202-1E and recitation PH202R-K3 (Fall 2006)

Class information is available at Mirov's web site http://heisenberg.phy.uab.edu/~mirov/SMirov_Teaching_Page22.htm

PH202-1E: Monday, Wednesday, Friday 12:00-12:50 pm, Campbell Hall (CH) Room 301

PH202R-K3: Wednesday 11:00-12:00pm, Campbell Hall (CH) Room 301. **Students are required to register and attend the recitation. This requirement will be enforced by credit bearing events during recitation.**

Instructor: Prof. Sergey B. Mirov **934-8088** (CH 421B), E-mail: mirov@uab.edu

Office Hours: Monday 10:00-12:00 n in CH 421B and by appointment.

Course Description: This is the second of a two-semester introductory, trigonometry-based college physics sequence. Topics include: Electric forces and fields, electric potential energy, electric circuits, magnetic forces and magnetic fields, electromagnetic induction, electromagnetic waves, optics, selected topics of modern and nuclear physics. The course has both a lecture and a required laboratory component.

Course Prerequisite: Physics 201/211.

Course Text: Cutnell & Johnson, PHYSICS, 6th Edition (2004, Wiley & Sons, ISBN: 0471-15183-1)

Lab. Text: Lab handouts will be provided. Labs will start the week of August 28.

Lab: Taking lab as co-requisite (same term) is a requirement. Assignments, protocol, due dates, and grading of labs will be discussed in the first lab meeting.

Tests and Exams: Three in-class 1 hour tests and one comprehensive final exam (2.5 hours) will be given. Textbook and notebooks are not allowed in the exams. One letter-size formula information sheet is allowed. A calculator may be used. There will be no make-up tests & exams except for the most extraordinary circumstances (documented illness, etc.). The tests & exams will be based on problems related to (but often with important differences) homework problems and problems discussed in class. The intent of the test & exam problems will be to test your understanding of physics principles and to test your ability to apply these principles to practice. To do well on the tests & exams, you should do the reading assignments before class, pay attention to lectures, and personally work all of the homework problems when they are assigned. The tests & exams will be graded on a step-by-step basis, with partial credit awarded for correct steps and techniques even if the answer is wrong. Full credit will be awarded only if the right answer is obtained for the right reason.

Homework:

Homework is electronically processed via an internet website:

<http://www.webassign.net/>

You are strongly advised to start homework as soon as a problem set is given. It is absolutely critical to work these problems yourselves when they are assigned, since this will help to lock in understanding of the physical principles learned from class and the textbook and develop problem-solving skills, which will be necessary for any type of success on the exams. Do not fall into the trap of just reading over or memorizing homework solutions, this will generally be of little or no use for solving the exam problems. Developing the necessary problem solving skills will only come from personally going through the struggle of working homework problems yourself. In order to solve homework problems, you need internet access and a web browser (Netscape or Internet Explore is recommended). Students who do not have internet access can use computers in Stern Library and Physics Labs (Campbell Hall 4th floor). Day schedule when 4th floor labs are open for use by students enrolled in PH202 will be set up by Dr. Todd Devore (CH468A, phone 934-4295, E-mail: devore@uab.edu).

Related UAB core learning outcomes: Students successfully completing this course will demonstrate knowledge of fundamental concepts in electricity, magnetism, optics, nuclear physics and the ability to apply this knowledge and mathematical skills in algebra, trigonometry and vectors for quantitative reasoning and problem solving.

Course learning objectives:

- Demonstrate knowledge and understanding of electromagnetism, optics, nature of atom, nuclear physics and radioactivity.
- Demonstrate ability to interpret data and apply the knowledge of the fundamental concepts of electromagnetism, optics, nature of atom, nuclear physics and radioactivity as well as quantitative reasoning and mathematical analysis skills to effectively solve problems. You should be able to: 1) read a description of the problem and translate nonscientific prose into the language of physics, identifying key physical variables that point to a solution; 2) set up a

figure or diagram to assist in analyzing the problem: 3) determine a relationship between the given physical quantities and the ones to be found; 4) carry out mathematical operations to arrive to a solution.

- Demonstrate (in the associated laboratory) the ability to collect, evaluate and communicate scientific information

Measurement of learning objectives: Homework problem sets and exams will be used regularly to measure understanding of the fundamental concepts presented as well as students' abilities to apply this understanding to problems in electromagnetism, optics, and nuclear physics. Both, problem sets and exams also provide an opportunity to evaluate the progression of students' understanding of physical concepts and problem solving skills.

Grading: The work to be graded consists of homework CAPA problem sets, physics 202 Lab, three interim tests, a comprehensive final exam, weighted as shown below:

Homework:	20%	(200 pts)
Lab	15%	(150 pts)
3 Interim Tests	$15+10+10=35\%$	$(150+100+100=350 \text{ pts})$
Final Exam (2.5 hr)	<u>30%</u>	<u>(300 pts)</u>
TOTAL:	100%	(1000 pts)

The overall average will be calculated according to the weights above, and the final letter grade will be determined as follows:

A: 90% or above

B: 80%-89%

C: 70%-79%

D: 60%-69%

F: 0% -59%

Other course policies: To do well on the tests & exams, you should attend and stay focused at the lectures, do the reading assignments of notes and textbook before class, and personally work all of the homework problems when they are assigned. Homework due is strictly enforced by a computer. No late homework will be accepted. There will be no make-up tests & exams except for the most extraordinary circumstances (documented illness, etc.).

Last day to withdraw from course with a "W" is October 23, 2006

Tentative Schedule:

#	Date	Text	Topics
1	Aug 23 (W)	CH 18	Electric Forces and Electric Fields – Lecture Notes
2	Aug 25 (F)	CH 18	Electric Forces and Electric Fields – Lecture Notes
3	Aug 28 (M)	CH 18	Electric Forces and Electric Fields – Lecture Notes
4	Aug 30 (W)	CH 18	Electric Forces and Electric Fields – Lecture Notes
5	Sep 1 (F)	CH 19	Electrical Potential Energy and the Electric Potential – Lecture Notes
	Sep 4 (M)	Labor Day	No classes
6	Sep 6 (W)	CH 19	Electrical Potential Energy and the Electric Potential – Lecture Notes
7	Sep 8 (F)	CH 19	Electrical Potential Energy and the Electric Potential – Lecture Notes
8	Sep 11 (M)	CH 20	Electric Circuits – Lecture Notes
9	Sep 13 (W)	CH 20	Electric Circuits – Lecture Notes
10	Sep 15 (F)	CH 20	Electric Circuits – Lecture Notes
11	Sep 18 (M)	CH 20	Electric Circuits – Lecture Notes and Review for Test 1
12	Sep 20 (W)	TEST 1 Grades	Test 1 over chapters 18-20 Correct Solution
13	Sep 22 (F)	CH 21	Magnetic Forces and Magnetic Fields – Lecture Notes
14	Sep 25 (M)	CH 21	Magnetic Forces and Magnetic Fields – Lecture Notes
15	Sep 27 (W)	CH 21	Magnetic Forces and Magnetic Fields – Lecture Notes
16	Sep 29 (F)	CH 21	Magnetic Forces and Magnetic Fields – Lecture Notes
17	Oct 2 (M)	CH 22	Electromagnetic Induction – Lecture Notes
18	Oct 4 (W)	CH 22	Electromagnetic Induction – Lecture Notes
19	Oct 6 (F)	CH 22	Electromagnetic Induction – Lecture Notes
20	Oct 9 (M)	CH 22	Electromagnetic Induction – Lecture Notes
21	Oct 11 (W)	CH 23	Alternating current circuits – Lecture Notes
22	Oct 13 (F)	CH 23	Alternating current circuits – Lecture Notes and Review for Test 2
23	Oct 16 (M)	TEST 2 Grades	TEST 2 over chapters 21, 22, and 23 Correct Solutions
24	Oct 18 (W)	CH 24, 25	Electromagnetic wave, The Reflection of Light: Mirrors – Lecture Notes
25	Oct 20 (F)	CH 25	The Reflection of Light: Mirrors – Lecture Notes
26	Oct 23 (M)	CH 25	The Reflection of Light: Mirrors – Lecture Notes
27	Oct 25 (W)	CH 26	The Reflection of Light: Lenses and Optical Instruments – Lecture Notes
28	Oct 27 (F)	CH 26	The Reflection of Light: Lenses and Optical Instruments – Lecture Notes
29	Oct 30 (M)	CH 26	The Reflection of Light: Lenses and Optical Instruments – Lecture Notes
30	Nov 1 (W)	CH 26	The Reflection of Light: Lenses and Optical Instruments – Lecture Notes
31	Nov 3 (F)	CH 27	Interference and the Wave Nature of Light (selected topics) – Lecture Notes
32	Nov 6 (M)	CH 27	Interference and the Wave Nature of Light (selected topics) – Lecture Notes
33	Nov 8 (W)	CH 27	Interference and the Wave Nature of Light (selected topics) – Lecture Notes
34	Nov 10 (F)	CH 27	Review for Test 3
35	Nov 13 (M)	TEST 3 Grades	TEST 3 over chapters 25, 26, and 27 Correct Solutions
36	Nov 15 (W)	CH 29	Particles and Waves (selected topics) – Lecture Notes
37	Nov 17 (F)	CH 30	Nature of atom (selected topics) – Lecture Notes
38	Nov 20 (M)	CH 30	Nature of atom (selected topics) – Lecture Notes
	Nov 22 (W)	Thanksgiving Holiday	No classes
	Nov 24 (F)	Thanksgiving Holiday	No classes
39	Nov 27 (M)	CH 31	Nuclear Physics and Radioactivity – Lecture Notes
40	Nov 29 (W)	CH 31	Nuclear Physics and Radioactivity – Lecture Notes
41	Dec 1 (F)	CH 31	Nuclear Physics and Radioactivity – Lecture Notes
42	Dec 4 (M)	CH 31	Nuclear Physics and Radioactivity – Lecture Notes
43	Dec 6 (W)	Review for Final	Review for Final - Sample Final exam
44	Dec 11 (M)	FINAL GRADES	FINAL EXAM Over Chapters 18-27, 29-31 (10:45am-1:15pm)