PHYS 1212 Syllabus

The University of Georga, Fall 2009

http://www.physast.uga.edu/classes/phys1212/meyer

Introduction: Welcome to Physics 1212. This course is the second half of a two-semester introductory sequence. This semester we will focus on electromagnetism, one of the four fundamental forces of nature. The understanding of electric, magnetic, and optical phenomena as different aspects of the same underlying force was a crowning achievement of 19th century physics. Without this understanding, our modern electronic world would not be possible.

The ordering of topics this semester will be different from the traditional sequence. We will start with optics, the study of light and how it interacts with matter. You will then learn about electric fields and electric potential. You will see how to apply those concepts to study electric circuits and currents (moving charges). Next we will discuss the magnetic field, and how electric and magnetic fields interact with each other. With any time remaining, we may touch on topics in modern physics.

As you know from your first semester of physics, this is a quantitative science. We won't neglect the qualitative and conceptual aspects of electromagnetism, but much of the work in this course will involve setting up and solving math problems. You will need to be able to communicate your results in a variety of ways mathematical and numerical expressions, diagrams and graphs, and even plain English. By now you should be comfortable with using algebra, geometry, and trigonometry in the context of physics, and well-acquainted with basic concepts such as units and dimensions, scientific notation, and significant figures.

Keep in mind that physics subjects are grounded in basic and widely-applicable principles. Mechanics concepts like force, energy, and torque will reappear in this course, and you will continue to make use of Newtons Laws, the conservation laws, and their applications (e.g., wave motion). If you don't feel comfortable with your background in mathematics or mechanics, please come see me.

If you are a physics or astronomy major, or if you are considering those possibilities, then this course is probably not for you. Please talk to Prof. Wiegert (physics) or Prof. Caillault (astronomy) for help in exploring your options.

Basic Information:

Instructor:	H. Meyer	Email:	hmeyer@hal.physast.uga.edu
Office:	223B Physics Building	Phone:	542-2020

Class:	TR 2:00 - 3:15 pm, 202 Physics Building
Lab:	Various times, 321 Physics Building
Final Exam:	Fr, December 11, 3:30-6:30 pm, Room TBA
Office Hrs HW Clinic:	TR 5:00 - 6:15 pm, 221 Physics Building

Required Course Materials:

- *Physics for Scientists and Engineers: A Strategic Approach*, 2nd ed, by R. D. Knight (Pearson-Addison Wesley, 2008). You may use the older edition if you wish, but you are responsible for knowing about any changes in content.
- An account on www.masteringphysics.com: An access code to this site is included with the required textbook. If you are using a used book or an older edition, you can buy an access code through the University book store or online.
- *Experiments for an Introductory Physics Course*, 5th ed., by R. M. Wood and S. P. Lewis. This is the same lab manual from the first semester of physics, and will be used in your lab section.
- A simple scientific calculator for exams, which must be non-programmable, non-graphing, and non-symbolic. Examples of acceptable calculators include the TI-30X series or the Sharp EL-531. The use of calculator graphing, algebra-solving, or programming functions will not be permitted for any exam, nor will PDAs, cellphones, etc.

Online Course Resources:

- The course Website at http://www.physast.uga.edu/classes/phys1212/meyer will be used to disseminate course information: homework assignments and solutions, exam solutions, practice problems, etc.

- Online assignments are an essential part of the course. You will access them with an account on www.masteringphysics.com.
- You will be subscribed to a low-volume email announcement list. It is important that you check your email daily.
- Grade information may be made available through eLearning Commons or its replacement software.

Other Student Resources:

- Optional weekly homework clinics will give you and your classmates an opportunity to work on problems in small groups. I will be on hand to answer questions and give guidance, but this is really designed for you to work together, not to watch someone else work problems.
- If you cannot come to my regular office hours, or need additional help, please set up an appointment (by email, by phone, or in person) to see me outside of class.
- There is a Student Study Guide with Selected Solutions for this textbook that may be useful, although students have given this guide mixed reviews. Information on this and other resources is provided in your textbook.
- Tutors are available either through the UGA Tutoring Program at Milledge Hall, or directly through the Department of Physics and Astronomy.

Grading Policy and Assignments: Your overall grade will be determined from your course performance, based on your weighted average percentage score, computed as follows:

20%	Cumulative final exam grade
45%	Three in-class exams (20% / 15% / 10% for highest/middle/lowest grades)
15%	Laboratory grade
15%	Homework grade
5%	Reading quizzes

Letter grades will be assigned from your overall numerical grade according to the following cut-offs:
A 90.0, **A-** 87.5, **B+** 85.0, **B** 80.0, **B-** 78.5, **C+** 75.0, **C** 70.0, **C-** 67.5, **D** 60.0, **F**

Average percentage scores will not be rounded (i.e., 89.9 is still an A–). Any requests for a regrade of an assignment or an exam must be made no later than one week after the item is returned. For a regrade I will look at the entire assignment/exam, not just one problem, and this may raise or lower your score. Regrade requests (including those for online homework) should be accompanied by all your work.

Exams: There will be three in-class midterm exams and a cumulative final exam. All exams will be closed-book and closed-notes. You may use a simple scientific calculator that is *non-programmable, non-graphing, and non-symbolic*. (Calculators such as the TI-83 or TI-84 are not allowed.) I will provide you with a formula sheet for each exam, and will also post it to the Web before the exam. The purpose of the formula sheet is to focus your studying on understanding rather than memorization. If you feel you need an equation that is not on the sheet, do not memorize it; learn how to derive it from the equations that are given. In the alternative, I may also allow you to use your course textbook (Knight), but no other printed material. Therefore, please always bring your textbook to every exam, in case I do allow you to use it.

Exams will comprise both conceptual and problem-solving questions, very similar to homework, practice problems, and in-class examples. Unless told otherwise, you must show your work on each problem in order to receive full credit. Partial credit is awarded (based on your work) for incomplete or incorrect answers, so it is usually in your best interest to attempt every problem. Detailed solutions will be posted to the Web after each in-class exam.

Exams are designed to test your understanding thoroughly and to distinguish among levels of performance. In order for exams to be effective assessments, raw scores will often be lower than the expectations created by the standard letter grade cutoffs. These raw exam scores will be converted into rescaled numerical grades. This conversion is based partly on the distribution of raw scores, but also on the difficulty level of the exam. A rescaled numerical grade will never be lower than your raw score. Also, unlike a typical curve, you are not competing against your peers; it is possible for everyone to get an A or B, for example. There will be no make-up midterm exams. If you need to miss a midterm exam for a serious

There will be no make-up exams. If you need to miss a midterm exam for a serious, documentable reason, your final exam grade will be substituted for your one of your midterms, making your final exam worth 30-40% of your overall grade (depending on how this grade compares to your other midterm exam grades). This policy is designed to handle unavoidable situations like medical or family emergencies, or previously scheduled academic or athletic events. You must contact me as soon as you know of the conflict (before the exam if at all possible), and you must provide sufficient documentation in a timely fashion. (An example of unacceptable documentation is a note stating only that you visited the health center, with no indication of the severity of your illness.) Do not simply presume that your situation or documentation merits an excused absence; that determination is not your prerogative. Unexcused exam absences will result in an exam grade of zero. A make-up final exam will be given only for students with legitimate, documentable reasons as explained above.

Homework: Regular, personal practice with physics problems is essential to understanding physics, so you will have weekly homework assignments. The assignments will generally be due every Thursday, although class pacing and scheduling may necessitate different due dates, which will be announced in class. Assignments will be posted online, and most problems will require you to submit your answers on the Web. However, some assignments may also have a handwritten component, which you should hand in to me directly or put into my mailbox in the main office, Room 201. (Do not slide anything under my office door.) Detailed solutions will be posted to the Web after the homework is due.

Each assignment will be weighted equally. Responses will be graded for correctness, although for some problems incorrect responses may earn partial credit for the effort. Problems that are to be handed in on paper must show all work legibly in order to receive credit. I will drop your lowest two assignment percentages in calculating your overall score. Again, this policy compensates for the unavoidable circumstances that may occasionally prevent you from submitting homework on time (e.g., illness, scheduled event, Internet failure, etc.).

Late homework will not be accepted or excused.

Teamwork can be a very effective way to learn, so I encourage you to collaborate with your classmates on homework problems. That is in fact a goal of the optional weekly clinics. However, do not mistake teamwork for plagiarism; your solutions must be your own. Copying or paraphrasing from someone else's work, or from any source of homework solutions, is a violation of academic honesty policies.

Since you can not collaborate on exams, homework is your best opportunity to develop your own problem - solving skills.

Reading Quizzes: You are required to read the assigned textbook sections before the class in which those topics are discussed. I will regularly assign short, multiple-choice online quizzes based on the reading material. Each quiz will be posted to the Web on the day before the class it pertains to, if not earlier. You must complete the quiz by 12:30 pm on the day of the corresponding class.

Regular reading is an important part of your preparation for class. Don't expect to understand everything in the textbook at first sight! However, your learning effectiveness in class will depend on having encountered the material prior to class. You should jot down notes and questions as you read; this will aid in organizing your class notes and will remind you to ask for clarification.

Extra Credit: A 0.5% bonus will be added to your final exam percentage score if you submit your online student course evaluation for this PHYS1212 course during the designated evaluation period at the end of the semester (dates to be announced) at the web site https://evals.physast.uga.edu/. No other extra credit will be given in this course.

Academic Honesty: The University of Georgia has a comprehensive policy on academic honesty, described in a document entitled A Culture of Honesty. This document is available through the Office of the Vice President for Instruction or online at http://www.uga.edu/ovpi/. This policy covers all academic work.

As a UGA student, you are responsible for knowing and understanding this policy. If you have any question about the appropriateness of your actions or your work, you are obligated to ask me for clarification.

I take the issue of academic honesty very seriously, and it is my responsibility to uphold the Universitys policy. This means, among other things, that I wont hesitate to report my suspicions of dishonesty to the Office of the Vice President for Instruction. Typical consequences of cheating on homework or an exam range from receiving a zero for that grade, to failing the course.

Schedule of Class Activities: PHYS 1212 Fall 2009

The schedule below is approximate and subject to modification, possibly including exam dates. Significant schedule changes will be announced in class and/or on the course web-site. Note that the midpoint withdrawal deadline is October 22, 2009.

Lecture	date	Chapter	Topic	Reading Assignment
1	Tu 8/18	22/23	intro, nature of light	22.1,23.1-2
2	Th 8/20	23	geometric optics	23.3-4
3	Tu 8/25	23	geometric optics	23.6-8
4	Th 8/27	24	optical instrumentation	24.1-2
5	Tu 9/1	24	optical instrumentation	24.3-4
6	Th 9/3	22	wave optics interference	22.2-3
7	Tu 9/8	22	wave optics interference	22.4
8	Th 9/10	22	wave optics diffraction	22.5, 24.5
9	Tu 9/15	Exam 1	Chap. 22-24	
10	Th 9/17	26	electric charge and force	26.1-4
11	Tu 9/22	27	electric charge and field	26.5 27.1-2
12	Th 9/24	27	electric charge and field	27.3-4,6
13	Tu 9/29	28	Gauss's law	28.1-3
14	Th 10/1	28	Gauss's law	28.4-6
15	Tu 10/6	29	electric potential	29.1-2,4
16	Th 10/8	29	electric potential	29.5-7
17	Tu 10/13	30	potential and field	30.1-3
18	Th 10/15	30	potential and field	30.4-6
19	Tu 10/20	Exam 2	Chap. 26-30	
20	Th 10/22	31	current	31.1,3,5
21	Tu 10/27	32	dc current circuits	32.1-4
22	Th 10/29	32	dc current circuits	32.6-9
23	Tu 11/3	33	magnetic field force	33.1-4
24	Th 11/5	33	magnetic field force	33.6-8
25	Tu 11/10	34	Faraday induction	34.1-4
26	Th 11/12	34	Faraday induction	34.5-9
27	Tu 11/17	35	electromagnetic waves	35
28	Th 11/19	Exam 3	Chap. 31-35	
29	Tu 12/01	38/39	Classical vs Quantum	
30	Th 12/03		Course Review	
	Fr 12/11	Final Exam:	Fr 12/11 ** 3:30-6:30 pm	Room TBA