

PHYSICS 270 Course Syllabus Spring 2015

Instructor: Dr. Andrew Smith (asmith44@umd.edu) Office: 2208 Phys. Sci. Com.

Lecture: MW 5-6:15pm, Physics 1410 Office Hours: MWF 4:00-5:00pm or by Appt

Mastering Physics ID: MPSMITH41058

Standard Course Description:

PHYSICS 270 is the third semester of a three-semester calculus-based general physics course designed primarily for engineering students. Electrodynamics, Maxwell's equations and electromagnetic waves, geometrical optics, interference, diffraction, special theory of relativity, and modern (quantum) physics.

Prerequisite: PHYS 161, PHYS 260-261

Co-requisite: PHYS 271 (lab course), you must be enrolled in and pass the laboratory course if you want to pass this course.....

Discussion Sections

Discussion sessions are where you should go to obtain follow up information to the material covered in lecture. While they are not compulsive, skip them at your absolute peril, they are invaluable, especially if you are having trouble keeping up in the course.

Teaching Assistant:

TBD

For schedules and venues of discussion sessions please consult TESTUDO.

Textbook:

"Physics (with Modern Physics) for Scientists and Engineers, A Strategic Approach" by Randall. D. Knight, 3rd Edition (we will use chapters 22 onwards). In addition to the textbook, you will need a copy of the "Physics 271 Laboratories" manual, which is a University of Maryland custom book published by Wiley. (used copies of the lab book are okay, but they must not have been written in)

Your Grade:

25% Lab

25% Exam Scores (Best 2 out of 3 Exams)

25% Homework

25% Final Exam (cumulative)

Homework:

Homework will be done through *Mastering Physics*. I will typically assign HW on Wed night after lecture and it will typically be due by 12:00am the following Wed (i.e. late Tue Night)

You must submit your answers for the homework problems over the internet using the Mastering Physics web site (see below).

There are several advantages to electronic homework submission:

- (1) You will know right away if your answer is right or wrong
- (2) If you give a wrong answer, you can go back and try again to see if you can get the correct solution.
- (3) You are graded only on your final answers and get your score when you are done.
- (4) The site also has a tutorial capability that you may find helpful.

Note that the software may randomize the numbers each time you make a new attempt on a problem, so be careful and remember that other students working on exactly the same problems are likely to have different numbers.

Why You Need to do the Homework: The principal way that you can understand Physics is by learning how to solve problems. The homework can be expected to be challenging, it counts a great deal towards your final grade and it enables you to succeed on your exams.

Getting started in electronic homework submission: To turn in your homework, you need to go to:

<http://www.masteringphysics.com/>

The site is best accessed with a current version of Windows Explorer or Firefox. If you run into problems, check the system requirements. In the past, there have been major issues working with Mastering Physics through Google Chrome, so please avoid using Google Chrome.

Registering and Gaining Access to Mastering Physics: In order to turn in your homework, you will need to register at the Mastering Physics website <http://www.masteringphysics.com/>. To register, you need two things - an access number and the class ID. When you buy (new or used copy of) your textbook you will need to purchase a Mastering Physics access key number. The easy way to do this is to simply buy it on line from the above MP website.

Your class ID is: MPSMITH41058

Exams:

You will have 3 in-class exams, plus a cumulative final. I will take the best 2 out of 3 in-class exam scores. You will be allowed 1 8.5x11 sheet of notes with equations on it (2 for the final), but they must be hand written. You can bring a calculator if you like, but it will most likely not help much as the exams are typically much more conceptually oriented.

Late Submissions and Make-ups

Turning in late homework is not allowed under any circumstances. Assignments will be given well in advance of the due date, so that it is in your interest not to wait until the last day to work on them, thereby avoiding that inescapable commitments or unforeseen emergencies could prevent you from submitting your work on time.

The lowest of three scores in the midterm exams will be dropped. No make-ups will be given under any circumstances. If you happen to miss one exam, due to illness or any other reason, that is the score that will be dropped. You must take the final exam in order to pass this course.

Students with disabilities

Accommodations will be provided to enable students with documented disabilities to participate fully in the course. Please discuss any needs with the instructor at the beginning of the semester so that appropriate arrangements can be made. *Students who are registered with DSS, and who are planning to take examinations at DSS facilities, are required to let me have the pertinent authorization forms in editable electronic format at least one week prior to each exam date.*

University Closure

In the event of a University Closure the department will do its best to accommodate students by scheduling make-up sessions or revision of the lab schedule.

Academic Integrity

All students will be expected to comply with the University of Maryland's academic integrity policies, including the [code of academic integrity](#) and the [honor pledge](#). Failure to comply will result in a failing grade and will be reported to the Honor Council.

Week of		Topic	Text Chapters
01.26	Mon Wed	Introduction, review of Electrostatics, Intro to Magnetism The B-field of a point charge + current, Biot-Savart	Ch 32.1-3 Ch 32.3-5
02.02	Mon Wed	Ampere's Law, Magnetic Force Catch up and Intro to Induction	Ch 32.5-9 Ch 33.1-3
02.09	Mon Wed	Lenz's Law, Faradays Law Applications of Induced Currents	Ch 33.4-8
02.16	Mon Wed	Inductors/Intro to LRC Circuits Exam #1	Ch33.8-10
02.23:	Mon Wed	AC Circuits Maxwell's Equations, intro to EM waves	Ch 35 Ch34.1-4
03.02	Mon Wed	EM Waves, polarization, applications Galilean Relativity, Einstein, and Events	Ch34.4-7 Ch 36.1-4
03.09	Mon Wed	Simultaneity, Time Dilation, Length Contraction Lorentz Transformations, Rel. Energy + Momentum	Ch 36.4-7 Ch 36.7-10
03.16		SPRING BREAK!!!!	
03.23	Mon Wed	Review of Relativity, General Relativity Ray Model of Light: Reflection + Refraction	Ch 36 Ch 23.1-4
03.30	Mon Wed	Exam #2 Image Formation with Mirrors and Lenses	Ch 23.4-8
04.06	Mon Wed	Optical Instruments Wave Optics: Diffraction	Ch 24 Ch 22. 1-4
04.13	Mon Wed	Wave Optics: Diffraction continued, Interferometry Experimental Results: Hints of a new paradigm	Ch 22. 4-6 Ch 38
04.20	Mon Wed	Foundation of Quantum Mechanics Probability and the Wave Function	Ch 38 Ch 39
04.27	Mon Wed	The Heisenberg Constraint The Schrodinger Equation	Ch 39 Ch 40
05.04	Mon Wed	Exam #3 The Weak and Strong Nuclear Forces	TBD
05.11	Mon	Class Summary/Review	