

PHYSICS 270 Course Syllabus Spring 2016

Instructor: Dr. Andrew W. Smith (asmith44@umd.edu)
Office: 2123 Phys. Sci Com.

Lecture: MWF 12-12:50pm, Physics 1412
Office Hours: MWF 4:00-5:00 pm or by Appt

Mastering Physics ID: MPSMITH20965

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. Part of your grade will be the completion of worksheets (through Learning Catalytics) in discussion section working in groups. Therefore, you must attend discussion to get these points.....

Teaching Assistants:

Donggeun Tak: takdg123@umd.edu
Milos Nikolic: mnikolic0706@gmail.com

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).

Your Grade:

35% Midterm Exam Scores (Best 2 out of 3 Exams)
25% Homework
15% Discussion Learning Catalytics
25% Final Exam (cumulative)

Homework:

Homework will be done through *Mastering Physics*. I will assign HW periodically, you will usually have around 1 week to complete the assignment. I will usually assign HW on Fridays to be due the following Friday. The due dates for your HW will be clearly marked on MP.

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: MPSMITH20965

Learning Catalytics:

Learning Catalytics (LC) is an in-lecture based student response system- this system will be used in discussion and will count towards your grade. Instead of using "clickers" you will interact with the LC through the use of any smart phone/tablet/laptop which has an internet connection. Please see me if you do not have one of these devices. You can purchase a LC membership for the semester for \$12 through:

learningcatalytics.com

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.

Grading Policy:

Your overall grade in this course will be curved. What this means is that at the end of the semester I will calculate the mean and standard deviation of the overall scores in the course. A score at the mean will represent a B- with the standard deviation determining the spread in scores required to attain the next lowest/highest grade.

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.

VERY LIKELY TO EVOLVE OVER THE COURSE OF THE SEMESTER

Week of		Topic	Text Chapters
01.25	Mon Wed Fri	Introduction, review of Fundamentals, Intro to Magnetism The B-field of a point charge + current, Biot-Savart Dipoles, Magnetic Force on a moving Charge	Ch 32.1-3 Ch 32 3-5 Ch 32 5,7
02.01	Mon Wed Fri	Ampere's Law, Force on Current Carrying Wires Intro to Induction Magnetic Flux, Lenz's Law	Ch 32.6, 8 Ch 33.1-2 Ch 33.3-4
02.08	Mon Wed Fri	Faradays Law, Induced Fields Generators and Transformers Inductors, LC Circuits	Ch 33.5-6 Ch 33.7-8 Ch 33.8-9
02.15	Mon Wed Fri	Review For Exam #1 Exam #1 Review of Resistors, Capacitors, RC Circuits	Your 260 notes
02.22:	Mon Wed Fri	AC Circuits 1 AC Circuits 2 Maxwells Equations	Ch 35 1-3 Ch 35 4-6 Ch 34 1-2
02.29:	Mon Wed Fri	Electromagnetic Waves EM Waves, polarization, applications Polarization, Applications	Ch34.2-4 Ch34.4-5 Ch34.6-7
03.09	Mon Wed Fri	Diffraction Diffraction II Diffraction III: Interferometry and Holography	Ch22. 1-2 Ch22. 2-5 Ch22. 6
03.14		SPRING BREAK!!!!	
03.21	Mon Wed Fri	Ray Optics I Ray Optics II Ray Optics III	Ch 23.1-3 Ch 23.3-6 Ch 23.6-8
03.28	Mon Wed Fri	Review For Exam 2 Exam #2 Galilean Relativity, Einstein, and Events	Ch 36.1-3
04.04	Mon Wed Fri	Simultaneity, Time Dilation Length Contraction Lorentz Transformations Rel. Energy + Momentum	Ch 36.4-6 Ch 36 7-9 Ch 36.9-10
04.11	Mon Wed Fri	The Photoelectric Effect The Photon Model, Matter Waves The Bohr Hydrogen Atom	Ch 38 1-2 Ch 38 3-4 Ch 38. 5-6
04.18	Mon Wed Fri	Waves, Particles, Probability Wave Functions, Wave Packets The Heisenberg Constraint	Ch 39 1-2 Ch 39 3-4 Ch 39 5-6
04.25	Mon Wed Fri	1D Quantum Mechanics I 1D Quantum Mechanics II 1D Quantum Mechanics III	Ch 40 Ch 40 Ch 40
05.02	Mon Wed Fri	Review for Exam 3 Exam 3 TBD	
05.09	Mon	Class Summary/Review	

Final Exam: Saturday May 14th, 6:30-8:30 pm, Room TBD