University of Maryland
Department of Physics
Physics 270 – FALL 2012
"General Physics: Electrodynamics, Light, Relativity and Modern Physics"
Lecture Date and Time: Tu, Th 5:00 – 6:15 PM
Lecture Room: 1412 Physics Building

Instructor: **Dr. Hailu G Bantu** **email:** **hailu@umd.edu**
Office: **3107 Physics Building** **Phone:** **x5-6024**

Office Hours: **Tu, Th 4:00 – 5:00 PM or by appointment**

Teaching Assistants: **Cho, Min-A**
Office: 3103B Phys Building
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Barlev, Gilad
Office: 3329 Energy research facility
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Discussion schedule:

Section	Date and Time	Room	TA
0101	Th 2:00 – 2:50 PM	PHY 1204	Min-A Cho
0102	Th 4:00 – 4:50 PM	PHY 1219	Min-A Cho
0103	W 9:00-9:50 AM	CHM 0128	Gilad Barlev
0104	F 1:00 – 1:50 PM	PHY 0405	Min-A Cho

Lab sections: You must enroll in Physics 271 and complete all the labs in order to pass Physics 270.

Textbook: ***Physics for Scientists and Engineers, A Strategic Approach, byRandall D. Knight (Addison Wesley)*, *Volume 3, 4, 5, second edition.***

- If you buy a new textbook, you must get it with an access number to a Materingphysics.com.
- If you buy a used copy, you will need to also purchase an access number (about $40) which you can do on-line or at the bookstore.

MasteringPhysics.com will be used to assign and collect most of the Homeworks.
Note that we will be using material in three different volumes!

Official Course Description:
Prerequisite: PHYS260, PHYS261 and MATH241.
Corequisite: PHYS271.
Credit will be granted for only one of the following: PHYS270 and PHYS271 (Formerly: PHYS263) or PHYS273. Formerly PHYS263. Third semester of a three-semester calculus-based general physics course. Electrodynamics, Maxwell's equations and electromagnetic waves, geometrical optics, interference, diffraction, special theory of relativity, and modern physics. PHYS270 and PHYS271 (lab) must be taken in the same semester and the grade for the courses will be combined into a single grade for both. To pass, students must complete passing work in both PHYS270 and PHYS271. CORE Physical Science Lab (PL) Course when take concurrently with PHYS 271. If purchasing used books additional software may be required.

Homework: There are two types of homeworks

1. There will be homeworks assigned electronically on Masteringphysics.com. ***You must answer all the problems on the site.*** The first time you log on to masteringphysics.com you will need to enter the course id, which is **"MPBANTUMDFALL2012"**. Each homework will be posted at least a week before the due date and the due date for each homework on Masteringphysics.com will be clearly indicated on the site. Homework on Masteringphysics will be graded by the computer.

   There are several advantages to electronic homework submission:
   (i) You will know right away if your answer is right or wrong
   (ii) If you give a wrong answer, you can go back and try again to see if you can get the correct solution. You will be allowed 5 attempts for each question, so don't waste them.
   (iii) You are graded only on your final answers and you will know your score when you are done.
   (iv) The site also has a tutorial capability that you may find helpful.

Note that the software will 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 will have other numbers! The best way to do physics problems is first to work out carefully a general solution and then plug in the numbers at the end. This is especially true if the numbers are being randomized each time so everyone has different numbers.

2. There will also be homeworks posted on www.elms.umd.edu and you must turn in your written solutions to these problems. Each of these homeworks consists of two or three problems chosen from each homework on masteringphysics.com. ***The written work must show how you arrived at your answers to these two or three problems in each assignment.*** The written homework handed in will be graded by a grader. Typically three problems will be assigned and one will be graded. ***This grade will be dependent on your problem solving technique as well as getting the correct answer.***

Quizzes: In order to test your progress and to encourage attendance quizzes will be given in the lecture period.

Exams: Three midterm exams and one final exam will be given. In computing your grade, ALL midterm exams will be counted. You must take the final exam to pass the course. You will be allowed to bring a one page (both sides) formula sheet prepared by you for the midterm exams. For the finals it will be announced sometime before the final. Calculators are allowed during exams, but you are not allowed to use any device with phone, photo, web, messaging or text display capabilities during an exam. If you cannot attend an exam at the scheduled time, see Professor Hailu Bantu before the exam! If you miss an exam with a valid excuse, a makeup exam will be given and it is your responsibility to arrange this in a timely fashion with the instructor. Students are responsible for all material, including that covered in assigned reading, lectures and homework. Material from any part of the course can appear on a test, quiz or homework, whether or not it was covered in the lectures.

Midterm exams: **Tuesday October 02, Tuesday October 30, Tuesday November 20**

Final exam: The final exam will emphasize the material in the final 3rd of the course. The current plan is to have a common final for all Phys. 270 on **Saturday December 15, 2012 6:30 – 8:30 PM**

Grading:

Homework – 20 % (12% - Masteringphysics.com, 8% - written HW)
Quizzes – 5 %
Midterm exams (10% each) – 30 %
Final Exam – 20 %
Lab – 25%(if all labs completed, F otherwise)

At the end of the semester all Lab, exam, quiz and homework grades will be added with the above weighting and a final letter grade will be assigned depending on the distribution of total scores.

***Important Notes**:

(1) YOU MUST BE ENROLLED AND COMPLETE ALL THE LABS IN PHYSICS 271 IN ORDER TO PASS PHYSICS 270. There are no exceptions. Students who do not complete all of the experiments in physics 271 will automatically get an F in both Physics 270 and Physics 271. Don't believe anyone who tells you differently.

(2) Phys 271 sections will meet the first week of class.

(3) You must take the Final exam in order to pass the course.

(4) No homework or exam scores will be dropped. Missing a homework assignment or exam will not be allowed without a valid documented excuse (medical problem, religious holiday, or serious family crisis). In all cases, a makeup assignment or makeup exam will need to be completed in a reasonable amount of time to get credit. The new due date and assignment must be arranged by consulting with Dr. Hailu Bantu as soon as possible after it becomes apparent that there will be a problem. If you are going to miss an exam or assignment because of a religious holiday, it is your responsibility to inform the instructor of any intended absences for religious observances in advance, so that suitable arrangements can be made.

Discussion Sections: You must attend your discussion section and you must go to the section you have been assigned. Your TA will cover material (homework and exams) that may not be covered elsewhere. Please come prepared so you can ask questions, *i.e.* read the assigned chapter and work on the homework problems. Remember, the TA is there to explain things and give help when you are stuck, not to dole out answers. Also, don't forget that your TA is also a student, in this case a graduate student, and also has to take classes, do homework and teach other sections. Please be respectful and understanding and expect that they treat you with the same respect and understanding.

Help with understanding the material: Physics and engineering are cumulative: the knowledge learned at each stage builds upon previous knowledge. If you find that you are falling behind, seek help early on, rather than waiting until just before an exam. Help can be obtained by:

- Attending your discussion section.
- Visiting the Slawsky Clinic, Mon. – Fri., in room 1140 Physics Building.
- Going to the office hours of your instructor or TA.
- The Learning Assistance Service (located in Suite 3125 of South Campus Dining Hall, 301-314-7693) helps students with time management, reading, note taking, and exam preparation skills.

Phys 270 Schedule for Fall 2012 (subject to change).

	Date	Topics	Knight Chapter
Week 1	08/30	**The Magnetic Field**	**33**
Week 2	09/04, 06	**The Magnetic Field**	**33**
Week 3	09/11, 13	**Electromagnetic Induction**	**34**
Week 4	09/18, 20	**Electromagnetic Induction** **Electromagnetic Fields and Waves**	**34** **35**
Week 5	09/25, 27	**Electromagnetic Fields and Waves**	**35**
Week 6	**10/02**	**EXAM 1**	
Week 6	10/04	AC Circuits	**36**
Week 7	10/09, 11	**AC Circuits** **Interference and Diffraction**	**36** **22**
Week 8	10/16, 18	**Interference and Diffraction** **Geometrical Optics**	**22** **23**
Week 9	10/23, 25	**Geometrical Optics** **Application, Optical Instruments**	**23** **24**
Week 10	**10/30**	**EXAM 2**	
Week 10	11/01	**Relativity**	**37**
Week 11	11/06, 08	**Relativity** **Modern Optics and Matter Waves**	**37** **25**
Week 12	11/13, 15	**Quantization**	**39**
Week 13	**11/20**	**EXAM 3**	
Week 13	**11/22**	**Thanksgiving Holiday – NO CLASS**	
Week 14	11/27, 11/29	**Wave function and Uncertainty** **One Dimensional Quantum Mechanics**	**40** **41**
Week 15	12/04, 06	**One Dimensional Quantum Mechanics**	**41**
Week 16	12/11	**One Dimensional Quantum Mechanics**	**41**
Saturday, December 15, 2012 **6:30 – 8:30 PM** **Final Exam**			