

# PHY 3300

# Course Information

# Winter 2013

**Lecture Time/Room:** MWF 12:50-1:45 PM

177 Physics

PHY3310 meets M 1:55-3:55 PM in 115 Physics

**Lecturer:** G. Lawes  
391 Physics  
577-2774

[glawes@wayne.edu](mailto:glawes@wayne.edu)

**Office Hours:** F 11:00-12:00 or by appointment

**Required Text:** There is **no required textbook for the course**. However, it is strongly recommended that you acquire a textbook for background reading and to provide an additional resource. I will be following *Modern Physics for Scientists and Engineers*, Taylor, Zafiratos, and Dubson, 2<sup>nd</sup> edition fairly closely, but there are a number of other excellent textbooks. These include *Modern Physics* by Serway, Moses, and Moyer and *Modern Physics* by Krane. These books can be obtained from used book sellers at very reasonable prices.

## Grade Determination:

Midterm 1	20%
Midterm 2	20%
Technical essay	15%
Homework	10%
Final Exam	35%

**Grading Scale:** A: 90%-100%, A-: 85-89%, B+: 80-84%, B: 75-79%, B-: 70-74%, C+: 65-69%, C: 60-64%, C-: 55-59%, D+: 50-54%, D: 45-49%, D-: 40-44%, F: 0-39%

## Exams

There will be two in-class exams in addition to the cumulative final exam at the end of the semester. All of these exams will be closed book but an equation sheet will be provided. The in-class exams will focus on selected chapters from the text, although you may be required to apply concepts from earlier chapters as well. The final exam is cumulative, with more emphasis placed on materials not covered in the earlier exams. There are **no make-up exams**, but under exceptional circumstances a missed midterm exam grade may be replaced by the final exam grade.

## Homework

Weekly homework problems will be assigned on Fridays and are to be turned in at the *beginning* of class of the second following Monday. Late homework assignments will not be accepted, although the two lowest homework grades over the semester will be dropped. The problems will be graded on a two point scale with the full two points being awarded for a complete and correct answer and one point for a reasonable attempt. Simply giving the final

answer will earn no points. Students are encouraged to work together to complete the homework assignments, but each student must turn in his or her own work.

### **Technical essay**

As part of this PHY3300 course, you will be required to write a short technical essay on some area of modern physics. A list of suggested topics will be provided, but you are welcome to select your own topic and check with me if it is reasonable. The essay will consist of three components: 1) A 300 word abstract due in February, 2) A first draft of the essay due in March, and 3) The final paper due in April. The abstract and first draft will be worth 5% of the final grade; the final paper will be worth 10% of the final grade. The essays should be approximately five pages (~1200-1500 words) long and be fully referenced.

### **In-class policies**

Out of consideration for the other students in the lecture please abide by the following rules of conduct: (1) Turn off all cell phones while in lecture, (2) Please arrive on time for lecture and do not leave early, (3) Please be mindful of your classmates.

### **Academic dishonesty**

All of the graded assignments are designed to measure your individual understanding of the material. No forms of cheating on these graded assignments will be tolerated (working together on the homework assignments is not considered cheating). Anyone found cheating on any graded activity will receive a grade of zero for that part of their grade, and may receive a failing grade for the course. *Students who plagiarize their essay will receive a failing grade for the course.*

### **Pre-requisites and co-requisites**

This course requires PHY2180. MAT2150 is a co-requisite. Physics majors must also take PHY3310.

### **Students with disabilities**

If you have any impairment that may interfere with your ability to successfully complete the requirements of this course, or you require additional resources in lectures or during exams, please contact the Education Accessibility Services (EAS) in Room 583 of the Student Center Building to discuss appropriate accommodations on a confidential basis. EAS can also be reached by phone at 313-577-1851.

### **Withdrawal**

The last day to withdraw from courses during the Winter 2013 semester is *Saturday, March 23<sup>rd</sup>*. After this deadline, there is no possibility to withdraw from a course.

## **Date Lecture Topics**

1/7- 1/11	Reference frames, relativity Time dilation, length contraction, mass
1/14- 1/18	Momentum, energy Atoms, electrons, protons
1/21	UNIVERSITY CLOSED
1/23- 1/25	Kinetic theory, experimental results Blackbody radiation, photoelectric effect
1/28- 2/1	X-rays, particle wave duality Atomic spectra, Bohr model
2/4- 2/8	de Broglie wavelength, electron diffraction Wave packets, uncertainty principle
2/11- 2/13 2/15	Catch-up and review <b>MIDTERM 1</b>
2/18- 2/22	Particle in a box Free particle, simple harmonic oscillator
2/25- 3/1	2D and 3D boxes Angular momentum, hydrogen-like ions
3/4- 3/8	Electron spin Exclusion principle
3/11- 3/15	UNIVERSITY CLOSED
3/18 3/20 3/22	REVIEW MIDTERM 2 Periodic table of the elements
3/25- 3/29	Atomic selection rules, lasers Nucleons
4/1- 4/5	Radioactivity, nuclear decay Nuclear fission and fusion
4/8- 4/12	Fundamental forces and leptons Hadrons
4/15- 4/17 4/19	Cosmology Catch-up and review
4/22	Catch-up and review
4/29	<b>10:40 AM-1:10 PM</b> <b>FINAL EXAM (COMPREHENSIVE)</b>