General Course Information

Physics 256, Electronics, Spring 2008

Staff

Instructor: Edward Eyler, office P325, lab P301
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Office hour: Monday, 10:30-11:30 AM, in P304 or P325. Also most evenings in P325.

Lab T.A.: Igor Senderovich, office P403A
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Office hours: To be announced.

Course Web Page

Lab writeups, problem sets, and a variety of resource material will be posted on the Physics 256 web page,
http://www.phys.uconn.edu/~eyler/phys256

Textbooks

This semester we will be using two complementary texts, one emphasizing basic principles and the other dealing almost exclusively with practical matters:

1. Curtis A. Meyer, *Basic Electronics: An Introduction to Electronics for Science Students* (Carnegie-Mellon University, 16 August 2007, unpublished). This text is free but is available only in .pdf form. An older version is available for open internet access, but a more recent edition is available here: http://www.phys.uconn.edu/~eyler/phys256/R/BasicElectronics.pdf. It is available for instructional use only by permission, so please do not redistribute this file to others without explicit consent from the author.

   This book was written for a course taught to second-year physics students at Carnegie-Mellon University, so it is very accessible. A particular strength is its detailed discussion of basic passive-component circuits and how to analyze them.

2. P. Horowitz and W. Hill, *The Art of Electronics, Second Edition*. Cambridge Press, 1989. ISBN number 0-521-37095-7.

   This is an excellent but excessively lengthy tome with an emphasis on the practical. Don't be overwhelmed by the details, many of which are intended for reference, rather than for textbook use. The accompanying laboratory manual (used for many of our labs) is:

3. T.C. Hayes and P. Horowitz, *Student Manual for The Art of Electronics*, Cambridge University Press, 1989. ISBN number 0-521-37709-9.

   Much more than a list of laboratory exercises, this guide to learning is filled with hints and intuitive descriptions. Several of our laboratory projects will be based on this manual.

Another good laboratory-oriented text, which is recommended but not required, is:

4. Daniel M. Kaplan and Christopher G. White, *Hands-On Electronics*, Cambridge University Press, 2003. ISBN number 0-521-89351-8.

This book lacks the some of the flair and insight of Hayes and Horowitz, but it is more up-to-date, and it does an excellent job of introducing the basics of the electronics lab, such as breadboards and digital oscilloscopes.

Another recommended secondary text is

5. James Diefenderfer and Brian E. Holton, *Principles of Electronic Instrumentation (3rd Ed.)*, Saunders, 1994.

   At first glance this would appear to be a superior choice as the primary text. However, students who actually use the book apparently feel otherwise; for example, there are several scathing student reviews at Amazon.com. Still, it provides a well-organized, focused treatment.

Assignments and Grading (subject to revision)

- Problem Sets: Distributed as needed, with most problems taken from either Meyer or Horowitz and Hill. There will be approximately 6-7 problem sets, which will contribute 25% to the course grade.
- Exams: A one-hour written midterm exam will contribute 15% of the course grade.
- Labs: The first 8-10 weeks will have structured laboratories, starting with a short introductory lab after our second lecture, on January 24. Lab handouts will be provided to provide details; most will be posted on the Physics 256 web page. You should bring a lab notebook or loose-leaf binder to record your observations. Brief lab write-ups will be required, presenting your fully analyzed results and your answers to any questions posed in the lab handout. A sample writeup for Lab 1 is available on the web page, and you can take advantage of it to save some time in writing up this first lab session. The T.A. will base your lab grade (35% of the total grade) on your in-lab performance and on both your lab notebook and your write-ups.
- Final Project: In most cases you will want to work with a partner. Each pair should decide on a project in consultation with the staff, preferably by the 7th week of the semester. The design, construction and testing of your project will contribute the remaining 25% of your grade. We will schedule demonstrations of the projects by each group during the last class meeting.