

Physics 3150/5190 – Electronics Lab

Fall 2012

Phys 3150/5190 Electronics Lab is an advanced laboratory course covering the principles and practice of electronics design. The course will be primarily based on laboratory exercises, but will have lecture, homework, and project components as well.

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Class Hours: MW 12:00 – 2:50, Physics 219

Office Hours: Tue 3-5

Webpage: <http://people.virginia.edu/~cas8m/classes/phys3150/2012/>

Includes links to lecture notes, lab assignments, homework assignments, and homework solutions, as well as other useful resources.

Text: Horowitz and Hill, *The Art of Electronics, 2nd edition* (recommended)

We shall not follow the text very closely, but it provides an excellent reference.

Laboratory exercises are based on the manual provided by the instructor.

Additional resources:

Hayes and Horowitz, *Student Manual for the Art of Electronics*

Grading:

<i>Lab exercises</i>	50%
<i>Homework</i>	15%
<i>Project</i>	14%
<i>Final exam</i>	20%
<i>Course Evaluation</i>	1%

Homework: Homework will be assigned periodically through the semester, with problems in circuit design and analysis. Students are welcome to work together, but must write up their solutions independently. Assignments are due at the beginning of class.

Late Assignments: Homework and lab reports will be accepted up to one week past their due date, but will be penalized by 10% of the full credit value. Assignments turned in after one week will require approval from the instructor and will normally suffer a significant penalty.

Project: Each student will complete an independent project, with details to be provided. Components for the project will cost about \$100, which you will be responsible for. Further details about the project will be provided later in the course.

Exam: There will be a final exam, which will be held in class on Monday, December 17, 2:00 - 5:00 PM. It will cover the design principles discussed in the course.

Course Evaluation: A modest grade credit will be given for completing the online course evaluation at the end of the semester.

Lab Key: You are welcome to use the lab after hours to complete the exercises. All students should check out a key from Helen McLaughlin, in room 101. You want the DA-35 key.

Lab Exercises

Lab Groups: Students will work in groups of two or three on the lab exercises. Groups will be assigned by the instructor and will change every few labs. One student will be designated the group recorder, who will be responsible for preparing the lab report as the exercise is completed. This duty will rotate after each exercise.

Lab Reports: Phys 3150/5190 is somewhat different from other laboratory courses, in that the intent is less to teach science than to provide you with tools for you to use in pursuit of science. As such, the reporting requirements for this course will be less formal than you may have experienced in other courses. The basic report you will turn in will consist of an Excel spreadsheet file. The group recorder is in charge of preparing the report.

As you proceed through a lab exercise, record in the Excel file all your results and answers to any questions posed in the exercise manual. You don't need to duplicate material that is already present in the manual, and you don't need to provide a continuous narrative of what you are doing, but do note any unexpected observations or extra investigations made. You don't generally need to describe difficulties that you encounter (such as initially wiring a component incorrectly or finding that a cable is broken), unless the solution is unexpected or interesting (such as the pin designation of an integrated circuit chip being different from what the lab manual said).

As you proceed, keep the file reasonably well organized, either by proceeding linearly down the page or by putting different sections on different (clearly labeled) tabs. In either case, label your work prominently enough to avoid confusing me. The beginning of the file should also clearly indicate the students in the group and the lab number.

At the end of the exercise, save the file as:

<name1_name2_name3_labnumber>

where the names are the last names of the students in the group, and "labnumber" is the number of the lab. For instance, if Thomas Edison and Nikola Tesla worked together on lab 6, the file name would be "edison_tesla_6". Following this file format will help me keep the files organized.

When you have completed the exercise, the group recorder should email the file to me at sackett@virginia.edu with a subject "Lab Report <filename>". I will add comments and a grade for the exercise, and send the file back to each student. I recommend saving the graded file in a secure place for later reference.

Grading: The lab exercises will be graded on four components:

- Completeness: Did you do all the parts of the lab and answer all the questions?
- Accuracy: Did you get the results I think you were supposed to get?
- Explanations: Were your answers to questions correct and did they illustrate that you understood what you were doing?
- Participation: Each student will be scored on the level of participation observed by the instructor during the lab exercise.

Each component will be weighted equally in the determination of the final grade.