

## PHYSICS 517/617 Spring 2011

Prof. L. S. Durkin

Office PRB3144 (292-4237)

Labs PRB3122, PRB3121, PRB3127 (292-8776)(292-6948)

(*PRB stands for the Physics Research Building. I will spend all my time in my three labs clustered together. Feel free to drop by.*)

HEP Sect: 292-7331

Office Hrs. Tues 10:30-11:30. & Thurs 10:30-11:30 PM PRB3144 or PRB3122

**LECTURES:** Monday 1:30-3:18 Rm. 1081 Hitchcock Hall)

**LABORATORY:** Tuesdays and Thursday 12:30-3:18 Rm. 1081 Smith Lab }

**TEXTBOOK:** *Practical Electronics for Inventors*, Paul Scherz, 2<sup>nd</sup> Edition, McGraw Hill.

**WEBPAGE:** <http://www.physics.ohio-state.edu/~durkin/phys617/index.html>

Additional references are included in this document and the books are on reserve in the Physics Library.

### **GOALS:**

This course (either 517 or 617) is designed to provide an introduction to electronics for students with a background at the level of a calculus-based introductory physics course in physics. Upon this basis we will rapidly build a basic understanding of passive components, semiconductors (diodes and transistors), and analog and digital integrated circuits. After completing this course a student should be able to make a variety of simple electrical measurements with some degree of proficiency, design and use basic circuits, and read the literature on more advanced circuitry and measuring techniques with a hope of understanding the subject. It is not expected that the student after taking this course will become sufficiently proficient in electronics to become a circuit designer.

### **PROCEDURES:**

There will be no examinations in this course. The grade in this class will be based on laboratory performance, laboratory reports, and homework. Every student must complete all assigned problems and each of the *basic* experiments. Students enrolled in Physics 617 are also expected to complete the advanced experiments. Physics 517 students can, if they wish, work on advanced experiments for extra credit, but only after first completing the *basic* experiment. The schedule

for the quarter shows dates when lab reports are due following the completion of each of the seven laboratory assignments.

The lab reports are to include, for each lab, an introduction, with objectives; raw data ( with circuit diagrams, component values, instruments used); a running account of your procedures; data analysis; error analysis (brief); and conclusions. Each lab report is worth 100 points and will be graded on the basis of your preparation for and initiative demonstrated in carrying out the experiment, and the extent of the investigation. Lab reports can be hand written. It is suggested that you learn to use computer generated plots of your data.

The homework assignments will come from the textbook and elsewhere. Some of the problems will be relevant to your preparation for laboratory experiments, so you should make an effort to keep up to date. The homework will be graded on the basis of 10 pts. per problem.

At the end of the quarter, grade assignments will be based on the following weighting scheme:

**Homework 20% Laboratory 80%**

In addition to the eight hours of formal class time, students should expect to spend a substantial amount of time each week reading, calculating, working problems, and preparing reports. The workload, especially at the beginning, will depend on any previous experience with electronics. Many students will find that they cannot complete the laboratories in six hours per week. Access to the laboratory at other than the scheduled times is possible by obtaining a lab key from the physics library. Students working outside of class hours are fully responsible for turning off lights and locking both doors when they leave. Free access to the room and your equipment is a privilege which will be revoked if it is abused.

**OFFICE HOURS:**

My office hours will be on Tuesday and Thursday, 10:30-11:30 or by arrangement at most other times. I am available at most other times at my laboratories ( PRB 3121, PRB 3122, PRB 3127), and I will be glad to drop what I am doing to discuss questions which you might have about the course.

*I hope that you find this class a rewarding one.*

