

PHYSICS 517/617 Summer 2008

Prof. G. P. Lafyatis

Office PRB4186 (292-2286)

Labs PRB4189

Office Hr. W 12:30 --- feel free to stop by at any time.

LECTURES: Monday 9:30-11:18 Rm. PRB 4122

LABORATORY: Tuesdays and Wednesdays 9:30-12:18 Rm. SM 1187 (Smith Lab)

BOOKS: I recommend you get *Practical Electronics for Inventors* and *The Art of Electronics* by Horowitz and Hill. Many of the homework problems are taken from *Introduction to Electronics for Scientists and Engineers*, Robert E. Simpson. While this book is no longer in print, copies of it are available in the lab and library.

WEBPAGE: <http://www.physics.ohio-state.edu/~lafyatis/phys517/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.

Homework assignments are due as indicated on the course calendar. 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 your BuckID. 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 Wednesdays 12:30 or by arrangement at most other times. I am available at most other times at my office or laboratory (4189 PRB), 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.