

General:

Physics 48 is an introduction to electronics for students who have had Physics 14 (or 16); in particular, second-year physics majors who are enrolled in Physics 41 are encouraged to take this course. The course is designed for students who wish to learn about analog and digital electronics.

A major goal of Physics 48 is to provide second-year students with enough knowledge of electronics and practical experience so that they can work productively in various research groups in the physics department during their third and fourth years.

Professor:

Simon Shepherd (visiting assistant professor, Ph.D. Dartmouth College, department of physics and astronomy, 1998) will be teaching the course and the labs.

Lectures and Labs:

The first lecture and organizational meeting will be held at 10:00 a.m. in room 216 of Wilder Hall. At that time all future lecture and lab times will be arranged according to the schedules of the students present. **It is important to attend this first meeting.**

Physics 48 will stress laboratory experience, therefore about half of the students' time commitment for the course will be spent in the lab. It is expected that we will spend two full afternoons (or mornings) together in the laboratory each week: typically starting with ~60 minutes of lecture and demonstrations, followed by building, testing, and experimenting with electronic circuits. In addition, there may be a third weekly class, which will consist of a lecture only (X hour). All lectures and labs will be held in room 216 of Wilder Hall. Although students will keep lab notebooks there will be no formal lab write-ups. Hands-on experience is the main goal. The instructor may, however, review students' notebooks periodically and offer suggestions.

The last 2-3 weeks of class the lectures and labs will be supplemented with some instruction by Dave Collins and Mike Trimpi (professional engineers on campus), who will introduce students to some valuable practical electronic skills, such as computer-aided design and layout, and soldering.

Homework:

There will be weekly homework problem sets consisting mainly of circuits to be analyzed. The homework will be closely tied to the work in lab.

Exam:

A written exam will be held during week 7 or 8 covering material from homeworks and lectures. The lab notebook will be the only allowed reference during the exam (incentive to keep a good notebook).

Project:

The final 2+ weeks of class will be devoted to special student projects. Work on these projects will replace the normal laboratory schedule. Each student will design, build, and demonstrate a circuit incorporating both digital and analog parts. A brief written report is also required. A number of project ideas will be suggested or students can make up their own.

Grading:

The grading will be roughly split evenly between the exam, lab work and homework, and the final project (~1/3 weight on each).

Book:

"Principles of Electronics: Analog & Digital" by Lloyd R. Fortney is the text we will use. Students should also purchase a quadrille-ruled notebook for use in the laboratory.