OPTI 360- Electronics for Optical Engineers and Scientists

Course Description:

Principles of electronics and circuit analysis, diodes and transistors, analog circuits and op-amps, digital logic and circuits, microprocessors and microcontrollers, computer interfaces, data acquisition systems, digital communication protocols. Prerequisites: PHYS 241 and advanced standing in B.S. in OSE program. [Last offered in 2008.]

Textbooks:

- Multisim Student Lite (software package), Electronics Workbench Corporation

Grading Policy:

- Homework 35%
- Two Midterm Exams 40%
- Final exam 25%

Objectives

To teach students the basic concepts of analog and digital electronics so that students will be able to understand circuit diagrams, make simple troubleshooting measurements on analog and digital circuits, discuss electronic problems intelligently with electrical engineers, and select and use electronic instruments and computer interfaces effectively.

Course Outline

- Basic concepts
- Kirchhoff’s laws, DC circuit analysis
- AC circuits, impedance, AC circuit analysis
- Op amps and op amp circuits
- Diodes and transistors
- AC power control
- Digital circuits, Boolean logic, and logic gates
- Digital logic blocks
- Microprocessors and microcontrollers
- Computer interfacing
- Data acquisition, process control
- Digital communication protocols
- Signal transmission, grounding, and noise
- Measurements and signal processing, signal analysis