OPTI 680- Microcomputer Interfacing in the Optics Laboratory

Course Description:

Fundamentals of digital electronics, computer and microcontroller operation and computer interfaces to laboratory equipment. Laboratory exercises teach the use of C, assembly language, and digital communication protocols to control interfaces with digital I/O devices, motors, A/D and D/A converters and other instrumentation.

Textbooks:

- Class notes

Grading Policy:

- 80% laboratory exercise grades
- 20% course project

Objectives

To provide a basic understanding of digital logic and computer hardware; common computer interfaces and computer interfacing techniques; C, Windows, and assembly language programming.

Outline

1. Digital logic and circuits
2. Storage of data and programs in memory
3. Assembly language
4. Computer and microcontroller operation
5. C programming
6. Digital I/O
7. D/A converters and waveform generation
8. A/D converters and data-acquisition systems
9. Stepper motors and motor control
10. Serial and parallel data communications
11. USB and other communications protocols
12. Computer networking