

Department of Electrical and Computer Engineering
520.349 Microprocessor Laboratory

- 2004-05 Catalog: This course introduces the student to the programming of computers at the machine level. General concepts relevant to microcontrollers are presented, including memory access, numerical representations, programming models, and coding techniques. (3 credit hours/Elective)
- Prerequisite(s): 520.142 Digital Systems Fundamentals or equivalent
Programming competence in a high-level language such as BASIC, C, or PASCAL
- Textbook: Digital and Microprocessor Fundamentals, William Kleitz, 4th edition, Prentice Hall, ISBN 0-13-093217-5
- Course Objectives: This course teaches the student how to program microprocessors in assembly language. The emphasis is on small 8-bit microcontrollers for use as control elements in embedded systems. Several different processors are covered in order to illustrate architectural differences and to cover common characteristics. Upon completion of the course, the student should be able to learn to use any low end microcontroller from the manufacturer's datasheets. Fundamental programming methods are covered, but real-time, input/output, and interrupt issues are not covered other than for a rudimentary exposure.
- Topics Covered:
1. Machine, assembly, high-level languages
 2. 8080/6800 data transfer instructions
 3. 6800 addressing modes
 4. Numerical representation
 5. Example Routines
 6. Delay Loops
 7. Zad assembler
 8. 6800 ALU/branch instructions
 9. Stack operations
 10. Subroutines
 11. Parameter passing
 12. Fox I/O routines
 13. Interrupts
 14. MCS-51 architecture and instructions
 15. State transition table programming
 16. Programming methodology
- Class Schedule: One – one hour class/weekly
One – two hour and fifty minute of laboratory/weekly

Contribution of Course to Meeting the Professional Component (credit hours):

Engineering Science	Engineering Science and Design
	3

Relationship of Course to Program Educational Outcomes (\checkmark those that apply):

x	Apply mathematics, probability and statistics, basic science, and computer science
x	Design and conduct experiments, analyze and interpret data
	Identify, formulate and solve electrical engineering problems
	Use technical skills and modern engineering tools to design to meet needs
x	Communicate effectively and work on multidisciplinary teams
x	Contemporary issues, ethical responsibilities, environmental, health, safety issues
	Engage in life-long learning

Prepared June 9, 2005 by: Robert Glaser