Course: ET 439  
Title: Microprocessor Application & Design

Instructor: Dr. Garth V. Crosby  
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Office Hours: Mon, Wed: 10a.m.-12 noon & 1-3 p.m.  
Instructor website: [www.engr.siu.edu/staff1/crosby/index.htm](http://www.engr.siu.edu/staff1/crosby/index.htm)  
Course website: D2L

Course Description

A study of microprocessor applications and embedded systems based on the 8051 family of microcontroller. This course introduces students to assembly language programming of microcontrollers.

Course Objectives:

To gain an understanding of microprocessor based computer architecture; to become proficient in assembly language programming for practical applications.

Learning Outcomes

At the end of this course students should:
1. Be knowledgeable of the 8051 family of microcontrollers and their various differences.
2. Be knowledgeable of the 8051 architecture.
3. Be knowledgeable of the issues to consider in selecting a microprocessor/microcontroller for a design project.
4. Be able to implement design projects using assembly language programming.
5. Be able to apply design skills to interface the microprocessor/microcontroller with various peripherals.

List of Topics

1. Overview of Number Systems and Digital Logic Fundamentals (ch. 0)  
2. Introduction to the 8051 Microcontroller (ch. 1)  
3. 8051 Assembly Language Programming (ch. 2)  
4. Jump, Loop and Call Instructions (ch. 3)  
5. I/O Port Programming (ch. 4)  
6. 8051 Addressing Modes (ch. 5)  
7. Arithmetic & Logic Instructions and Programs (ch. 6)  
8. 8051 Hardware connection and Intel Hex File (ch. 8)  
9. Timer Programming in Assembly (ch. 9)
10. Serial Port Programming in Assembly (ch. 10)
11. Interrupts Programming in Assembly (ch. 11)
12. 8051 Interfacing (selected peripheral)

Typically, we will cover one of the above mentioned topics in one to two weeks. Some topics will require additional time. Based on the programming experience of the class we may also cover chapter 7.

**Assessment (subject to change at instructor’s discretion):**

1. Homework – 10%
2. Lab- 20%
3. Test 1- 15%
4. Test 2 -15%
5. Test 3- 15%
6. Final Exam- 30% (Comprehensive)
7. Project- 10%

One of the tests will be dropped, that is, best two of three tests.

Project presentation will be in the final week of classes.

**Final Exam- Date & Time**

Wednesday, May 7, 2014; 12:50-2:50 p.m.

**Grading**

A: 90-100
B: 80-89.9
C: 70-79.9
D: 60-69.9
F: below 60

**Class Policies**

i) Class attendance is required and class role will be randomly taken. Attendance data will be used to determine border-line grade adjustments.

ii) In exceptional cases a make up test will be given to a student that complies with all of the following:

1. Call (or email) instructor **BEFORE** test time to notify of problem.
2. Bring written proof to instructor.

The following situations apply for a make-up:
1. The make-up test will be of more complexity and more exhaustive than the original test missed and will include all materials up to the date of the make-up test.
2. Only one test can be missed; therefore, only one test make-up will be given.
3. The time and place of this make-up test will be announced in advance, and you must sign up with the instructor a minimum of one week in advance.

Recommended Course Text


Reference
Manufacturers’ manuals. Additional material will be posted on D2L.

Emergency Procedures:

Southern Illinois University Carbondale is committed to providing a safe and healthy environment for study and work. Because some health and safety circumstances are beyond our control, we ask that you become familiar with the SIUC Emergency Response Plan and Building Emergency Response Team (BERT) program. Emergency response information is available on posters in building on campus, available on the BERT’s website at www.bert.siu.edu, Department of Public Safety’s website www.dps.siu.edu (disaster drop down) and in the Emergency Response Guidelines pamphlet. Know how to respond to each type of emergency.

Instructors will provide guidance and direction to students in the classroom in the event of an emergency affecting your location. It is important that you follow these instructions and stay with your instructor during an evacuation or sheltering emergency. The Building Emergency Response Team will provide assistance to your instructor in evacuating the building or sheltering within the facility.