The Ohio State University
Department of Electrical and Computer Engineering

ECE 265 **Introduction to Microprocessor-Based Systems** **Spring 2009**

Meeting Time:	3:30pm MWF, 120 Caldwell Laboratory
Instructor:	Professor David Orin, 660 Dreese Lab
Office Hours:	After class Monday & Wednesday
Teaching Assistant:	Aarti Krishnamoorthy, 601 Dreese Lab, email: krishnamoorthy.9@osu.edu
TA Office Hours:	12-1 p.m., Monday & Wednesday
Course Web Site:	http://www.ece.osu.edu/~orin/ece265
Text:	*Data Acquisition and Process Control with the M68HC11 Microcontroller, 2nd Ed.*, by F. F. Driscoll, R. F. Coughlin, and R. S. Villanucci, Prentice-Hall, 2000.
Prerequisites:	ECE 261, and En Graph 167 or CSE 221 or CSE 202, and concur: ECE 206
Grades Via Carmen:	http://carmen.osu.edu

Grading:	Quizzes	15%
(Tentative)	Homework & Computer Problems	25%
	Midterm Exam	30%
	Final Exam	30%

General Comments

1. There will be short quizzes (about ten minutes) on many Wednesdays. The lowest quiz grade will be dropped. As a result, there will be **no make-up quizzes**.

2. Homeworks will be assigned most weeks. They will typically be due on the following Wednesday in class. **No late homeworks** will be accepted. Solutions will be made available on Carmen after the due date for the assignment.

3. One week's notice will be given to announce the day of the midterm exam. Make-up exams will virtually NEVER be given.

4. Grading questions should be resolved within one week of the time when the graded work is returned. Check with the TA first.

5. A simulator and assembler are available for the M68HC11 that is used as the basic microcontroller in the text and class. It is used in homeworks especially later ones in the quarter. You can download it off the web to install on your home PC. There is a link for it on the 265 web pages.

Class Schedule (Tentative)

Day	Reading	Subject
1	I.0-I.5, 1.0-1.2	Introduction: computer organization, microcontrollers
2		M68HC11 microcontroller, memory, address space
3		Registers, buses, and data transfers
4		Basic instruction organization and timing
5	2.0-2.7	M68HC11 architecture: registers, stack
6		Condition code register, decimal arithmetic
7	2.8-2.9	Addressing modes, effective address
8	3.0-3.2	M68HC11 instruction set, load & store instructions
9	3.3-3.6	Arithmetic and logic instructions
10	3.7	Shift and rotate instructions
11	3.9-3.10	Branch instructions, time delay program
12	3.11-3.12, 3.14	Index register instructions, subroutines and examples
13	4.0-4.6	Assembly language programming, assembler directives
14		Hand assembly, THRSim11 assembler & simulator
15	5.0-5.3	Designing and writing program modules, tables
16		Use of stack in subroutines
17		Review for Midterm
18		Midterm examination
19	9.0-9.2, 1.3-1.5	M68HC11 ports and pinouts, software control of ports
20		Parallel ports, port I/O registers
21	10.0, 10.2*	LED, 7-segment display, and switch interfaces
22	App. F (to pg. 656)*	Synchronization in data transfers, handshaking
23	1.3.6, 2.4.6-2.4.8	Interrupts, interrupt vector, interrupt service routine
	2.9, 3.13, App. D*	Interrupt masks, polling
24		Interrupt examples – keeping time, parallel port transfers
25	7.0-7.5, 7.7	M68HC11 analog-to-digital converter
26	5.9*	A/D control & status reg., binary to BCD code conversion
27	9.3-9.4	M68HC11 main timing system, time of day program
28		Serial ports
29		Review for final
30		Final examination

* Optional reading

Purpose: The purpose of this course is to introduce the student to the concept of a microprocessor/microcontroller as an electrical system component used to help solve real-time problems in control, communications, etc. The student is introduced to the architecture, programming, and interface requirements of a real microcontroller, the Motorola 68HC11.

Goals: The principal goal of this course is to make the student microprocessor/microcontroller literate by introducing him or her to the basic terminology, concepts, and methods used in the solution of problems by incorporating a microcontroller as part of the solution. Although the course is not intended to teach the students how to carry out a detailed physical design, the student should, at the completion of the course, be able to understand, analyze, and evaluate actual microprocessor/microcontroller designs.