EEL4746 Microprocessor-Based System Design

Fall Semester 2006

Instructor:	Dr. Ming Yu	**Lecture Hours:**	TR 1:15 – 2:30 PM
Office:	Room B367	**Classroom:**	B210/211
Phone:	(850) 410 - 6263	**Office Hours:**	TR 11:30 AM – 12:30 PM or by appointment
Email:	mingyu@eng.fsu.edu	**T.A.**	Jeffrey Connor, connoje@eng.fsu.edu

Required Textbooks:

(1) *Microcontrollers and Microcomputers*, by Frederick M. Cady, Oxford, 1997.

(2) *Software and Hardware Engineering, Motorola M68HC11*, by Frederick M. Cady and James M. Sibigtroth, Oxford, 1997.

Course Web Page:

A course web page is available under the FSU Blackboard System at http://campus.fsu.edu.

Note: All FSU students registered for the class are automatically enrolled on the web page. FSU students: log in using your Garnet account ID and password. FAMU students log in using their engineering account user name appended with "_eng", and their engineering password (Example: If your engineering email address is JDoe@eng.fsu.edu and your engineering password is "eestudent", then login in as "JDoe_eng" with password "eestudent"). *FAMU student must then select the course and use the enrollment button to add their names to the course web page roll.* **IT IS REQUIRED FOR ALL FAMU STUDENTS TO ENROLL, AND ALL FSU STUDENTS VERIFY ENROLLMENT IN THE COURSE WEB PAGE.**

Catalog Description:

Fundamental topics in basic computer design, structured assembly-language software design, RTL, CPU design, pipelineing and superscaling, computer arithmetic, memory and I/O organization and interface, cache, and design tools.

Prerequisites: EEL 3705, EEL 3705L.

Course Objectives:

At the completion of this course the student should be able to:

1. Identify important parts of a microprocessor-based system design.
2. Calculate physical memory addresses from instruction opcodes and interpret different source and destination addressing schemes.
3. Interpret memory and register operations and results by analyzing assembler code to determine data movement and microprocessor state.
4. Calculate binary, hexadecimal, decimal and two's complement number conversion, and solve arithmetic relationships using signed and unsigned integer arithmetic.
5. Identify microprocessor interface types and design interface routines using assembly language.
6. Develop and verify an assembly language program for a modern microprocessor.
7. Analyze contemporary issues in microprocessor-based design.
8. Recognize the need for lifelong learning and engage in lifelong learning.

Topics Covered:

(1) Introduction
(2) Review of Digital Logic and Binary Numbers
(3) Introduction to Computer Architecture
(4) Introduction to Assembly Language
(5) M68HC11 Hardware & Addressing Modes
(6) Assembly Language for the M68HC11
- Programming and Debugging (AS11 & Buffalo)
- M68HC11 Instruction Set

Review for Test #1 and Test #1

(7) Structured Programming
- Top-Down Design, Bottom-Up Implementation

(8) Parallel Input/Output
(9) Processor Interrupts
- Real-Time Events

Review for Test #2 and Test #2

(10) M68HC11 Timer
(11) Analog Input and Output (if time allows)

Review and Q & A Session for the Final Exam

Relationship to ABET Program Outcomes: A, C, E, I, J, K, and O (CpE).

Grading Policy:

Test 1	20%
Test 2	20%
In-Class Assignments/Quizzes	10%
Homework Assignments	10%
Project	10%
Final Exam	30%

Note: Questions, problems and errors involving the grading of any assignment or test must be brought to the attention of the instructor ***within 1 week*** of the graded work's return to the *class*. A student's absence from class does not extend the time limit. After 1 week the grade is final and will not be reviewed at the student's request.

Class Policies:

Exams/Tests:

- Test dates announced at least 1 week in advance
- In-class assignments and quizzes will be given without notice
- All or part of test or exam may be assigned as a take-home assignment
- No make-ups will be granted unless **prior** approval has been obtained from the instructor or for university-recognized excused absence.

Homework:

- Assignments are due at the *BEGINNING* of class on the due date
- Assignments may be required to be submitted on-line through Blackboard
- Late assignments will not be accepted

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- Assignments are considered independent unless specifically stated otherwise
- Group assignments or projects may be assigned

Attendance:

- Class attendance is required for all students. College and University rules allow only 3 unexcused absences for this course. The grades for those exceeding 3 unexcused absences will be lowered at least by one level.
- Coming late or leaving early for 5 minutes will be considered as the absence from class.
- Cellular phones and beepers must be turned off in the classroom.

Ethics/Honor Code:

All students are bound by the honor code of their university. Violations of the honor code will be reported. Penalties include but are not limited to 1) failing grade on the assignment and 2) failing grade for the course. Students are encouraged to discuss topics and homework, but the work itself is to be performed on an individual basis.

Computer Usage:

This course will make use of compilers and simulators. Course material such as assignments, schedule, notes and solutions will also be posted on the course web page (Blackboard). Your grades will also be posted (password protected) on the web page.

Students with Disabilities:

Students with disabilities needing academic accommodations should:

(1) Register with and provide documentation to the Student Disability Resource Center (SDRC); and

(2) Bring a letter to the instructor from the SDRC indicating you need accommodations.

This should be done within the first week of class.

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