Department of Electrical and Computer Engineering

Spring 2010

CPE 323: Introduction to Embedded Computer Systems

Course Home Page: http://www.ece.uah.edu/~milenka/cpe323-10S/

Lectures

Instructor
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Office hours
Monday/Wednesday 1:00 - 2:00 PM or by appointment.

Lab Instructors
Ms. Zahra Atashi, EB 242-A, Tel: 824 6304, Email: atashiz@ece.uah.edu
Mr. Avula Mallikarjun (Max), EB 246-E, Tel: 824 3485, Email: ma0004@uah.edu
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Description
The course examines both hardware and software aspects in building embedded computer systems, as well as methods to evaluate design tradeoffs between different technology choices. The students develop an appreciation of technology capabilities and limitations and appreciation of all system components necessary to design and implement a basic embedded computer system and interface it to the outside world. Experiments performed in the Microcomputer Laboratory provide considerable experience, allowing students to develop programs in assembly language and C and program embedded systems to perform required functions.

Prerequisites
EE 202, CPE 212. Corequisite: CPE 323L

Text

References
- Class handouts (lecture notes and tutorials)
Grading

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Laboratory assignments</td>
<td>30%</td>
</tr>
<tr>
<td>Homeworks</td>
<td>15%</td>
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<tr>
<td>Test I</td>
<td>15%</td>
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<td>Test II</td>
<td>15%</td>
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<tr>
<td>Final Exam (comprehensive)</td>
<td>25%</td>
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Late
Homeworks and Lab reports – 10% off per day

Submission
Homeworks and Lab reports will not be accepted after 5 days past the due date

Important
Test I & Test II: February 24, 2010 & April 07, 2010 (tentatively).

Dates
Last day of Class: April 26, 2010.
Final exam: May 3, 2010 (3:00 – 5:30 PM).

Course Outline
- Introduction to Microprocessor-Based System Design
- TI MSP430 Microcontroller: An Introduction
- Programmer's View (TI MSP430): Registers, Data types, Memory, Addressing Modes, Instruction Sets, Instruction Encoding
- Software development: Assembly Programming and Debugging (TI MSP430)
- Software Development: C/C++ (TI MSP430)
- TI MSP430 System Architecture
- Exception Handling, Basic clock module
- I/O Interfacing: Parallel Ports, Timers (Watchdog Timer, Timer A, Timer B) (TI MSP430)
- I/O Interfacing: Serial Communication (TI MSP430)
- I/O Interfacing: ADC (TI MSP430); DAC (TI MSP430); DMA (TI MSP430)
- Advanced Topics: Building An Embedded Computer Systems

Laboratory
The Microcomputer Laboratory is located in the room 106 of the Engineering Building. Students will be required to work individually on a set of laboratory experiments that are designed to reinforce the material being covered in the class.

Lab Policies
1. You must demonstrate your solution for each laboratory assignment to the lab instructor during your assigned lab session.
2. You must hand in a printout of your code and test vectors to the lab instructor.
3. Although highly discouraged, lab assignments may be turned in after the due date with a penalty of 10% off per day late (including weekend days). Lab assignments will not be accepted more than 5 days late.

Academic Policy
See http://www.ece.uah.edu/~milenka/cpe323-10S/#Info