# CPE/EE 421/521: Microcomputers

**Course Home Page:** [http://www.eb.uah.edu/~milenka/cpe421-05F/](http://www.eb.uah.edu/~milenka/cpe421-05F/)

## Lectures
Monday/Wednesday 2:20 - 3:40 PM, EB239.

## Instructor
Dr. Aleksandar Milenkovic  
217-L, Engineering Building  
Phone: 824 6830  
E-mail: [milenka@ece.uah.edu](mailto:milenka@ece.uah.edu)  
Web: [http://www.ece.uah.edu/~milenka](http://www.ece.uah.edu/~milenka)

## Office hours
Monday 5:15 - 6:15 PM, Wednesday 12:30 – 1:30 PM, and by appointment.

## Description
The goal of this course is to teach students how to design microcomputer systems and how to utilize a microprocessor as a basic system component or single chip microcomputers. The course begins with an overview of typical microcomputer architecture and examines the hardware features of the microprocessor system. Basic microcomputer design and the interface between the microprocessor and external devices are explored. This course examines the software aspects of microcomputers using assembly language and C programming. The course also introduces single chip microcomputers for embedded and power efficient applications. By the end of the course the students have studied all the computer components necessary to be able to design and implement a basic 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 and C and download them into a target microcomputer.

## Prerequisites
CPE/EE 321 (Computer Organization).

## Text

## References
Grading

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<th>Undergraduate</th>
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<tr>
<td>Laboratory assignments</td>
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<td>Homeworks</td>
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<td>Test I</td>
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<td>Final Exam (Comprehensive)</td>
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<td>Discretion</td>
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Late Submission
Homeworks and Lab reports – 10% off per day
Homeworks will not be accepted after 5 days past the due date

Important Dates
Test I & Test II: W7, W12 (tentatively)
Last day of Class: December 5, 2005.
Final exam: December 9, 2005 (3:00 – 5:30 PM).

Course Outline

- Introduction to Microprocessor-Based System Design
- Motorola 68000 processor Architecture
- Microcomputer Architecture -- Programmer's View (overview of MC68000 family of microprocessors basic assembly language programming of the MC68000)
- MC68000 Software development (Lab Session)
- Software Development for the MC68000 (High-Level Language Considerations – C programming)
- Single chip microcomputers - Hardware and System Issues (Texas Instruments MSP430 microcontroller family)
- TI MSP430 Software development (Lab Session)
- Single chip microcomputers – Low Power Issues
- Single chip microcomputers – Software Issues, Exceptions, Interrupts, Real time operation, Real time kernels
- Microprocessor Architecture – Hardware Details (MC68000 CPU specifications, pin descriptions and timing analysis, I/O interfacing, Parallel and serial data transfer using custom hardware and MC6800/MC68000 type peripheral IC’s)
- Microcomputer System Design (ROM, EPROM, EEPROM, Static and Dynamic RAM, connections, signals and timing)

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.

Academic Policy
See [http://www.ece.uah.edu/~milenka/cpe421-05F/#Info](http://www.ece.uah.edu/~milenka/cpe421-05F/#Info)