

Cleveland State University
Department of Electrical Engineering and Computer Science

EEC 417: Embedded Systems

Catalog Description:

EEC 417 Embedded Systems (3-0-3).

Pre-requisites: EEC 315 or EEC 316, EEC 384

Software design of microcontroller-based embedded systems. Topics covered include microcontroller architecture, assembly programming, real-time interrupts, external interrupts, input/output issues, analog-to-digital conversion, serial port reception/transmission, step motor control, and RS232 communication.

References:

I do not recommend any specific books, but there are a lot of books about the Microchip PIC. Go to amazon.com and browse books under the subject: Computers & Internet – Hardware – Microprocessors & System Design – PIC Microcontroller.

Coordinator:

Dr. Dan Simon

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Web: <http://academic.csuohio.edu/simond/>

Course web site: <http://academic.csuohio.edu/simond/courses/eec417>

Office: FH 343

Lab: FH 310

Office Hours: M W 2:15–4:00

Call or stop by my office any time and I'll be glad to help you if I'm available.

Course Objectives:

After taking this course the student should be familiar with Microchip's microcontroller products. The student should be able to design an embedded system using a Microchip microcontroller. The student should be able to interface the embedded system with the electronics in order to collect data and control external devices. In addition, the student should be able to choose an appropriate microcontroller for an embedded system based on system requirements. The student will also be in a position to design embedded systems with microcontrollers and digital signal processors from companies other than Microchip.

Equipment:

Each student needs the following equipment for this course.

1. A microcontroller development kit (student purchase).
2. Miscellaneous lab equipment, including a solderless breadboard, a wire cutter/stripper, a digital multimeter, and several colors of solid 22-gauge wire (student purchase).
3. A kit of electronics parts for the labs (borrowed).

This equipment and its prices are listed at <http://academic.csuohio.edu/simond/courses/eec417/parts.html>.

Grading:

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| Labs | 35% |
| Quizzes | 15% |
| Midterm | 25% |
| Final Exam | 25% |
| Project | ---- |

Short quizzes will be given on random days during the semester before the lecture. The quizzes will cover the material from the previous lecture.

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| A | 93–100 |
| A minus | 90–92 |
| B plus | 87–89 |
| B | 83–86 |
| B minus | 80–82 |
| C plus | 77–79 |
| C | 70–76 |
| D | 60–69 |

Labs:

Lab assignments are generally due two class periods after the lecture material is given. Lab assignments can be handed in as many as 48 hours late, but those that are handed in late will be penalized 20%. Students are encouraged to work together on lab assignments, but those who hand in identical assignments will be given a grade of zero. Lab assignments must be handed in as hard copies. You can fax your assignment if you are not at school on the day that the lab is due.

Tests:

Quizzes and exams will be open-book and open-notes. No electronic devices are allowed during tests. No makeup tests will be given without the prior permission of the instructor.

Attendance:

Attendance is required only during the last two regular class periods during the project presentations. Attendance on those two days will count toward your grade in an amount equal to one quiz.