

Section 10312, MW 1:00-3:10 pm, FLH426

## Catalog Description

CDA3331C Introduction to Microcomputers

### 4 Credits

*Prerequisite: CDA3201C and COP2212 (strictly enforced)*

Architecture of a 32-bit microprocessor; addressing modes, instruction set, assembly language programming, program design, hardware model, exception handling and interface to memory and peripherals. Training kits will be used in the lab to run assembly programs. C cross compiler may be used for the course project.

## Course Objectives

1. To learn the fundamental hardware and software structures of microprocessors.
2. To learn the basic concept of microprocessor-based control systems.
3. To develop basic to moderate skills in assembly language programming.
4. To learn basic interface between computing systems and real-world devices.
5. To demonstrate knowledge by performing 5 simple to moderate lab exercises using a 68000 MP actual training board connected to real-world I/O controls such as sensors and actuators.

## Student Learning Outcomes

- SLO#1 Proficiency in the areas of electronics, computer architecture and computer design.
- SLO#3 An ability to plan and execute an engineering design to meet an identified need.

## Text

Antonakos, James L., The 68000 Microprocessor, Hardware and Software Principles and Applications, 4E, Upper Saddle River, New Jersey, Prentice Hall, Inc., 1999.

*Diskette with the text:* It includes all source files presented in the book. Also, two programs, ASM68K and EMU68K, are provided to allow students to assemble and execute (emulate) 68000 programs on personal computers.

## Lab

The course includes lab experiments, which are mainly assembly language programs. You will use the software in the lab to edit, assemble, and load your programs to the 68000 boards to run them. These experiments are designed to put learned concepts into actions. The labs cover data arrays (sorting), math functions (factorial), bit manipulation (image processing), and interface with real-world controls (sensors and actuators).

## Grading Policy

Grades will be determined primarily from the following:

Five quizzes/homework assignments:

5 x 10 = 50 points

Five lab experiments:

5 x 5 = 25 points

Final examination:

25 points

**Total**

**100 points**

It is for your advantage to read ahead and promptly solve all assigned homework problems. On the due date, you will be asked to either submit parts of your homework assignment or take a quiz. No make-up quizzes are allowed unless official excuses are provided. Missed assignments and quizzes will receive a zero grade. Depending on the overall performance of the class, a quiz#6 may be given and then the lowest quiz of the six will be dropped.

## Office Hours and Policy Changes

Office hours are posted on my office door and on my web site. Other times are available by appointment. Changes in class policies may be necessary during the semester and if so, the changes will be announced in class and posted on my web. It is the student's responsibility to be aware of any changes and announcement though out the semester by viewing this course page on my web site twice a week.

## Course Outlines

1. Preliminaries
2. Introduction to the 68000
3. Addressing modes
4. Instruction set
5. Exception processing
6. Programming the 68000
7. Memory and I/O systems
8. Advanced programming