

CDA 3331C Introduction to Microprocessor System

Credits and hours: 4 credits; 2 classes per week of 110 minutes each

Text book, title, author, and year: Programmable Microcontrollers with Applications: MSP430 LaunchPad with CCS and Grace1st Edition, by Cem Unsalan and H. Deniz Gurhan, 2013.

Supplemental materials: none.

Specific course information

- a. **Catalog description:** Architecture of a 16-bit microprocessor; addressing modes, instruction set, assembly and C 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 and C programs.
- b. **Prerequisites:** CDA 3201C, COP 2212.
- c. **Required, elective, or selected elective:** selected elective

Specific goals for the course

- a. **Specific outcomes of instruction:** By the end of the course students will: 1. Learn the fundamental hardware and software structures of microprocessors. 2. Learn the basic concept of microprocessor-based control systems. 3. Develop basic to moderate skills in assembly language programming. 4. Learn basic interface between computing systems and real-world devices. 5. Demonstrate knowledge by performing 5 simple to moderate lab exercises using a MSP430 Launchpad connected to real-world I/O controls such as sensors and actuators.
- b. **Student outcomes addressed by the course:** a, b, c, e, and k

Brief list of topics to be covered:

1. Preliminaries
2. Introduction to the MSP 430
3. Introduction to Code Composer Studio
4. Introduction to programming MSP430 in C
5. Introduction to assembly language
6. Digital input and output
7. Interrupts
8. Timers
9. Mixed signal processing