EEL 4742L: Advanced Microprocessor-Based System Design Lab

Curriculum Designation: Elective lab for EE majors. Required laboratory for CpE majors.

Course (Catalog) Description: Laboratory in support of EEL4743 Advanced Microprocessor-Based System Design

Prerequisite: EEL4746 and EEL4746L

Co-Prerequisite: EEL4742


Course Objectives:

1. Maintain a lab notebook and describe the results of each lab experiment in a predefined format.
2. Use a modern IDE to design, code, and implement C language and assembly language routines and programs that will run on a prototype or development board.
3. Design, code, and implement C language or assembly language software routines and programs that will utilize advanced interface techniques to connect to peripherals.
4. Use debugging techniques to solve programming difficulties and to observe program behavior in an embedded system.
5. Use interrupts to synchronize hardware and software in real-time embedded systems.
6. Demonstrate the ability to acquire, interpret and apply technical documentation to the design of embedded microprocessor systems.
7. Design, code, assemble, debug, and test C and assembly language

Topics covered:

1. Introduction to CCS and the MSP432
2. Interfacing to peripherals using GPIO
3. Interface to peripherals using interface standards
4. Synchronize hardware and software systems
5. Use interrupts for complex timing
6. Design system using display
7. Design motor control system
8. Design a simple real-time system
9. Use a RTOS to implement an algorithm with multiple peripheral interfaces
10. Final Project

Class Schedule: One 165 minute lab per week (1 credit hour).

Subject Area: Engineering

Significant Design: Yes

Relationship to Assessed ABET Student Outcomes: 7(a-d) (CpE only)

Last Updated by: R.J. Perry Date: 4/30/2021