

ECE 36200 - Microprocessor Systems and Interfacing

Type of Course

Required for the CmpE and EE programs

Catalog Description

An introduction to basic computer organization, microprocessor instruction sets, assembly language programming, and microcontroller peripherals.

Credits

4

Contact Hours

Class: 3, Lab: 3

Prerequisite Courses

ECE 27000, ECE 20700, ECE 22900

Prerequisites by Topics

Digital logic design, computer programming.

Textbook

The Definitive Guide to ARM Cortex-M3 and Cortex-M4 Processors, third edition, by Joseph Yiu, Newnes, 2013

Course Objectives

The objective of this course is to become familiar with the architecture and the instruction set of an ARM microprocessor. Assembly language programming will be studied as well as the design of various types of digital and analog interfaces. The accompanying lab is designed to provide practical hands-on experience with microprocessor software applications and interfacing techniques

Course Outcomes

Students who successfully complete this course will have demonstrated

1. An ability to understand a modern CPU instruction set. (7)
2. An ability to solve an engineering problem (for example, arithmetic calculation, string operation, etc.) using assembly language. (1)
3. An ability to use debugging and troubleshooting techniques.(6)
4. An ability to know the concept of stacks during function calls. (1)
5. An ability to know the mixed programming of C and assembly language. (1)
6. An ability to interface CPU with various devices. (6)

7. An ability to understand interrupts. (1)

Lecture Topics

1. Review of number systems
2. ARM microprocessor architecture
3. ARM microprocessor addressing modes
4. Assembly language programming and debugging
5. ARM assembly instruction set
6. ARM Cortex M3 based Microcontroller
7. Memory interfacing
8. I/O interfacing
9. Analog-to-Digital and Digital-to-Analog conversion interface
10. Communication between the microprocessor and other peripherals

Computer Usage

High

Laboratory Experience

High

Design Experience

High

Coordinator

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Date

09/30/2018