

CSE379: INTRODUCTION TO MICROPROCESSORS & MICROCOMPUTERS (3 Credits, Required)

Catalog Description

Microprocessor architecture, machine language programming, microprocessor assemblers, assembly language programming, software development, memory and I/O interface, interrupts, microprocessor system design and microprocessor applications.

Prerequisites

Prerequisites: CSE241 or EE378

Corequisites: CSE380

Textbooks(s) and/or other required material

Steve Furber. (2000). ARM System-On-Chip Architecture, 2nd Edition, Addison Wesley.

Course Objectives

The objectives of this course are to give students an understanding of how a microprocessor is organized and designed, familiarize students with how microprocessors function, introduce assembly language programming, introduce microprocessor system design techniques, introduce memory system design, introduce serial and parallel I/O, and introduce the ARM AMBA standard.

At the end of this course, each student should be able to understand how a microprocessor is organized, write ARM assembly language programs that interface with memory and peripherals, design a memory subsystem for an ARM-based microprocessor system, and design an ARM-based microprocessor system for a control application.

Topics Covered

- microprocessor concepts
- instruction set architecture
- memory design and interfacing
- input/output concepts
- interrupt and exception handling
- timing considerations
- the ARM AMBA standard
- system design techniques

Class / Lab Schedule

Two 80 minute lectures per week

Contribution of course to professional component/criterion 5

Engineering Topics: 3 credits

Engineering Design

Relationship of course to program outcomes

This course is required of all computer engineering students and has a significant relationship with the following program objectives for computer engineering:

(c) an ability to design and construct a complex hardware and software system, component, or process to meet desired needs using relevant software engineering principles, within realistic constraints such as economic, environmental, social, political, ethical, health & safety, manufacturability, and sustainability

(e) an ability to identify, formulate, and solve hardware and software computer engineering problems using sound computer engineering principles

(h) the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context

This course has a strong relationship with the following program objectives for computer engineering:

(a) an ability to apply knowledge of mathematics, probability & statistics, computer science, and electrical engineering as it applies to the fields of computer software and hardware

(i) a recognition of the need for an ability to engage in lifelong learning

(k) an ability to use the techniques, skills, and modern hardware and software engineering tools necessary for computer engineering practice

Persons who prepared this description and date of preparation

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