

Relevant Course: Microprocessor and Microcontrollers

Relevant Department : Electrical Engineering

Relevant Semester: 5

Pre-requisite: Nitty Gritty of Processor Design

Course Description & Outline

Processor Board and Memory mapping

- Recollecting earlier discussions.
- External memory as a bunch of addressable registers.
- Signals controlling an external memory.
- Peripheral controllers and adding different peripherals through a Peripheral Controller.
- Understanding the concept of Memory Mapping.
- Using Chip select for unique placements.
- Unmapped address spaces
- Best Practices in memory mapping.
- Demonstration of the concept of Regular mapping with an example
- Complexity of Irregular mapping explained with an example

Connecting Peripherals and concept of Polling and Interrupt

- Peripheral Interface Controller(PIC).
- Working of a 4*4 Keyboard.
- Use of Polling to detect Key press.
- Using Interrupts to detect Key press.
- Understanding General Interrupt handling
- Interrupt flow process and Nested Interrupts.

Peripheral Controllers, Display Controller and DMA

- Three types of PIC Registers.
- Understanding the Control, Status and Data Registers.
- A brief note on common Display Peripherals.
- Using Display controller to display appropriate pixels on Display Peripheral.
- Memory Bus Cycle.
- Dissecting the MOV Instruction.
- Comparing the access times of different types of memories.
- Processor handling different access times.
- Concept of DMA and its working.
- Understanding the Block transfer and Cycle Stealing modes of DMA.
- Advantages and disadvantages of DMA.

Peripherals: Communication, Disc & Mouse Controller and Timer

- Understanding Communication Peripheral Controller and Communication Fundamentals.
- Ethernet controller as a sample communication Controller
- The concept of disc controllers.
- Illustrating the Data storage on disks in tracks and sectors.
- Accessing the Disc and Reading/Writing on it.
- Mouse controller.
- Timer Peripheral and controller.

Schedule for Lecture Delivery

Session 1 : 15-Sep-2016 (10-12 pm)

Session 2 : 21-Sep-2016 (10-12 pm)

Session 3 : 22-Sep-2016 (2-4 noon)