EE-308 Microprocessor Based System Design
Spring 2020-2021

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Catalog Data: EE 308 Microprocessor Based System Design (4 cr.) Prerequisites: CS 303. Introduction to hardware and software design of microcomputer systems. Basic working principles of microprocessors, memory and I/O devices, bus interconnections, assembly language programming, integration of hardware and software design. Serial communications, parallel interfacing, interrupts and interrupt handlers, timing analysis and delay handling in microcomputer circuits. A term project involving the design and implementation of a self-contained microcomputer system for a specific purpose (i.e., embedded system) will be assigned, in addition to regular software/hardware lab assignments.

Reference Material:
- PIC24FJ256GB110 Family Data Sheet
- MPLAB® Assembler, Linker and Utilities for PIC24 MCUs User’s Guide
- PIC24 Family Reference Manuals (contains detailed peripheral information)
- MPLAB® XC16 C Compiler Users Guide

Computer Usage: Assembler and C in MPLAB® X IDE.

Course Information and Software Resources:
- EE308 Course Web Page: http://acoustics.sabanciuniv.edu/ee308/
- Microchip Website: http://www.microchip.com
- Mississippi State ECE3724 Page: http://sites.google.com/site/ece3724/Home

Goals: To develop the engineering skills of the students to design microprocessor based systems.

Prerequisites by Topic:
- Analysis and design of logic circuits.
- Basic computer organization, number representations and basic computing algorithms.
- Register transfer microoperations, datapaths, sequencing and control.
- C programming.

Weekly Schedule:
01 22/02–26/02 Basic microcomputer structure
02 01/03–05/03 Microcomputer programming: basics
03 08/03–12/03 Microcomputer programming: memory management Quiz#1
04 15/03–19/03 Microcomputer programming: I/O management Lab#1
05 22/03–26/03 Microcomputer programming: data structures Quiz#2
06 29/03–02/04 Interrupt interfacing and management I Lab#2
07 05/03–09/04 Interrupt interfacing and management II Quiz#3
08 12/04–16/04 Device driver design Lab#3
09 19/04–23/04 Keypad, ADC/DAC and display device interfacing Quiz#4
10 26/04–30/04 Serial interfacing: asynchronous protocols Lab#4
11 03/05–07/05 Serial interfacing: synchronous protocols Quiz#5
12 17/05–21/05 Sensor Interfacing: protocols and physical layer Lab#5
13 24/05–28/05 DC Motor interfacing. Quiz#6

General Rules
- Homework and lab assignments are announced one week before the deadline.
- Submission deadlines and exams are never postponed.
- Quizzes will be held during class hours.
- Cheating and late submissions are severely penalized.

Grading: Quizzes 50%; Lab work & Project 35%; HWs 5%; Final 10%.