

Texas A&M University–Corpus Christi
College of Science and Technology
Engineering Technology

Course Number and Title: ENTC 4418 Microprocessors and Microcontrollers

Weekly Schedule: 3 hours lecture and 3 hours laboratory

Prerequisites: ENTC 3415 Circuit Analysis II and ENTC 3416 Digital Logic

Course Description:

Introduction to microprocessor and microcontroller architecture, programming, and interfacing. Topics include addressing modes, instruction set, I/O operations, interrupts, timing, memory, peripheral interface devices, control of external devices, and an overview of advanced microprocessors and microcontrollers.

Textbooks

1. The 8088 and 8086 Microprocessors: Programming, Interfacing, Software, Hardware, and Applications, 3rd Ed., Walter Triebel and Avtar Singh, 2000, Prentice Hall.
2. Lab Manual to Accompany The 8088 and 8086 Microprocessors, 3rd Ed, Walter Triebel and Avtar Singh, 2000, Prentice Hall.
3. The 8051 Microcontroller and Embedded Systems, Muhammad Mazidi and Janice Mazidi, 2000, Prentice Hall.

Course Objectives

This course is designed to enable students to:

- State the major features of the 8051, 8088/86, 80286, 80386, 80486, and Pentium.
- Use the 8086/8051 addressing modes and instruction set.
- Write assembly language programs.
- Use DOS and BIOS interrupt services.
- Differentiate between the minimum and maximum modes.
- Create memory mapped I/O ports.
- Read/write from/to input/output ports.
- Program the 8051 for serial data communication.
- Design microprocessor and microcontroller interface circuits.

Assessment

	Points		If	Grade
Quiz	5		$90 \leq \text{Total} < \text{XX}$	A
Midterm 1	20		$80 \leq \text{Total} < 90$	B
Midterm 2	20		$70 \leq \text{Total} < 80$	C
Lab Experiments	20		$60 \leq \text{total} < 70$	D
Homework	10		$\text{xx} < \text{Total} < 60$	F
Final	25			

Total	100		
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Topics Covered

Intro to microprocessors/ microcontrollers, Software model of the microprocessor, Memory segmentation/address space, Debugging programs, Instruction set/ addressing modes
Assembly language programs, Microprocessor/microcontroller programming, Microprocessor /microcontroller programming, Microprocessor hardware characteristics, Memory and I/O interfaces, Input/output interface circuits, Interrupt interface of the 8086/88, 8051 I/O port programming, 8051 addressing modes, 8051 serial communication, 8051 real-world interfacing.

Laboratory Exercises/Experiments:

Lab 1 The Debug Commands and Hex Code

Lab 2 Compiling and Building Executable Files

Lab 3 Addressing Modes

Lab 4 Programming and Procedures

Lab 5 Calculating the Average of Signed Numbers

Lab 6 Multiplication of Signed Numbers

Lab 7 Replacing the PC Power Supply, floppy disk drive, and hard disk drive

Lab 8 PC motherboard and features of the microprocessor, RAM, and ROM chips

Lab 9 Design and programming of a 6821 interface circuit

Lab 10 Using INT 10H and INT 21H software interrupt functions

Lab 11 Accessing the Printer Parallel Port on a PC

Lab 12 Microcontrollers in interfacing applications

Prepared by: Ray Bachnak

Date: _____