

220 CPE Course Syllabus

Course Code	220 CPE
Course Name	Microprocessor and Interfacing
Credit Hours	3
Contact Hours	2
Instructor Name	Dr. Mehrez

Text Book (title, author, and year)
<ul style="list-style-type: none">• R.S. Goankar, Microprocessor Architecture Programming and Applications with the 8085/8085A ,5th edition.• The 80X86 IBM PC and Compatible Computers: Assembly Language, Design, and Interfacing Volumes I & II”, Muhammad al-Mazidi, Prentice Hall.

Specific Course Information	
Catalog Description	The content of this course focuses on introduction of microprocessor architecture, bus organization, assembly language programming, interfacing of memory and peripheral devices and ultimately the development of microprocessor based standalone system for certain application.
Prerequisites	211 CNE Computer Design and Organization
Co-requisites	NIL
Required/Elective	required

Course Learning Outcomes	
1	Define the fundamental knowledge of INTEL microprocessor architecture, registers, bus organization and Interfacing of memory and peripherals.
2	Develop an ability to identify, formulate and solve problems related to Microprocessor.
3	Develop an ability to use the techniques, skills and tools necessary for Microprocessor based applications.
4	Develop skills to think and solve problems in cooperative work with others.
5	Show respect to the teacher and classmates.
6	Demonstrate an ability to communicate ideas of microprocessor orally.

Mapping course LOs to the SLO.

Course LOs #	Student Learning Outcomes											
	a1	a2	b1	b2	b3	b4	b5	c1	c2	c3	d1	d2
1	√											
2			√									
3				√								
4								√				
5									√			
6												√

List of Theory Topics

- **Introduction to computer architecture** - Introduction to microprocessor, Organization & architecture of 8085 Microprocessor, functional block diagram, registers, ALU, bus systems, timing and control signals..
- **8085 instruction set & Programming:** Instruction, set-data transfer, arithmetic operations, logic operations and branch operations. Programming techniques looping, counting and indexing. Additional data transfer and 16-bit instructions. Arithmetic operations related to memory. Logic operations- rotate, compare and debugging.
- **The 80x86 computer architecture:** Processor instructions: operation (op) codes, operands Registers, Arithmetic logic unit (ALU), Input/output (I/O), Instruction register and decoder, Program counter (PC) and memory address register, Instruction execution cycle, Program execution time.
- **CPU Architecture Details:** Processor registers: accumulators, address registers, stack pointer (SP), index registers, condition code register, Flag bits: zero, sign, carry, overflow, Programmer's model.
- **Addressing Modes for the 80x86:** Instruction forms, Addressing Modes: Register addressing mode, Immediate addressing mode, Direct addressing mode, Register Indirect addressing mode, Base plus index addressing mode, Register Relative addressing mode, Base Relative Plus Index addressing mode.
- **Instruction Set for the 80x86:** Data Transfer Instructions, Arithmetic Instructions, Logic Instructions, Comparison Instruction, Jump Instructions.
- **Computer Buses and I/O:** I/O addressing: memory mapped vs. I/O mapped, Address decoding: full vs. partial , Simple I/O devices: switches, displays (LED, 7-segment), buzzer, 8255, 8253.

List of Lab Experiments

- Introduction to 8085 block diagram, registers, 8085 Simulator
- Most commonly used 8085 instructions, Basic programs on 8085 Microprocessor
- Introduction to 8086 block diagram, General structure of assembly program
- Programs on data transfer instructions using 8086 Microprocessor
- Programs on Arithmetic instructions using 8086 Microprocessor
- Programs on logical instructions using 8086 Microprocessor
- Programs based on Rotate, Branch and Loop Instructions using 8086 Microprocessor
- Programs to find the length of the string and display a string using 8086 Microprocessor & Home Work-1
- Programs in operations on array using 8086 Microprocessor
- Interfacing Timers with 8086 Microprocessor & Home Work-2
- Interfacing 7-Segment Display with 8086 Microprocessor
- Interfacing a Stepper motor with 8086 Microprocessor