Department of Computer Engineering	
Microprocessors (66322)	
Total Credits	**3**
major compulsory	
Prerequisites	P1 : Digital Circuit Design I (66221)
Course Contents	

1. Introduction to Microprocessor and Computer Systems Historical Background Personal Computer Number Systems (Review) Data Formats ASCII code Review 2. Microprocessor Architecture Internal Microprocessor Architecture 8088/86 Architecture 8088/86 Registers Address and Data Buses Control Signals Structure of a Microprocessor System: Memory and I/O Segments: Data, Code, Stack and Extra Segments. 3. Instruction Set Instruction Set Format Operations and Operands Zero, One, Two, and Three Operand Instructions. Overview of 8088/86 Instruction Set. 4. Addressing Modes Immediate Addressing Direct Register Addressing Indirect Addressing Relative Addressing Base Plus Indexed Addressing 5. Data Transfer Instructions MOV Instruction Stack Instructions. I/O instructions String Instructions. 6. Arithmetic and Logic Instructions Arithmetic Instructions: Add, Subtract Multiply and Divide Flags Logic Instructions Decimal Instructions. 7. Program control Instructions Unconditional Jump Conditional Jumps Call and Return Software Interrupts. 8. Hardware Specifications The 8088/86 pins De-multiplexing and Buffering Reseat and Clock Read Timing Write Timing Interfacing Slow Memory (ready signal) 9. Memory Interface ROM types RAM Interfacing logic: AND gates Interfacing logic: Decoders. Interfacing logic: PAL Dynamic Memories 10. Basic I/O interface Interface Logic : Random Logic, Decoders, and PALs Basic Input and Output Ports. Interfacing LEDS and Pushbuttons Keypads and Keyboards. Seven Segment Displays and LCDs DAC and ADC Programmable ICs Serial Port Interfacing Motors: Step and DC motors. 11. Interrupts Software Interrupts Maskable and Non-Maskable Interrupts Hardware Interrupts. Interfacing I/O using hardware Interrupts

	Intended Learning Outcomes (ILO's)	**Student Outcomes (SO's)**	**Contribution**
1	Acquire fundamental and intermediate knowledge of microprocessors systems including instruction set Architecture, assembly programming, and high level programming.	C	30 %
2	Acquire knowledge and skills in analysis and design of the hardware aspects of microprocessor systems including timing analysis and memory interfacing.	C	25 %
3	The ability to interface various I/O peripherals and design the interfaces from hardware and software aspects. The peripherals include: Keyboards, displays, ADC/DAC, serial, motors and others.	K	25 %
4	The ability to analyze and design a complete practical microprocessor system from both hardware and software aspects	E	20 %

Textbook and/ or Refrences	
Text Book:: Barry B. Brey. The Intel Microprocessors	

Assessment Criteria	**Percent (%)**
First Exam	20 %
Second Exam	20 %
Homeworks	10 %

	Final Exam	50 %

Course Plan	
Wee k	**Topic**
1	Introduction to Microprocessor and Computer Systems
2	Microprocessor Architecture: registers, Control, Data Bus, Address Bus. Stack, Memory.
3	Overview of Microprocessor Instruction Set: Format , Data Movement, Arithmetic and Logic Instructions, Stack Instructions, Program Control.
4	Instruction Set Format, Addressing Modes
5	Data Transfer Instructions
6	Arithmetic and Logic Instructions, Program Control Instructions
7	MIDTERM EXAM 1
8	Hardware Specs of Intel Microprocessors, Read and Write Timing.
9	Memory Interfacing: RAM, ROM, Dynamic RAM
10	Memory Interfacing: Random Logic, Decoders, PALs
11	I/O interfacing. Basic Input Device, Basic Output Devise.
12	Keyboards, Displays, LCDs
13	DACs and ADC interfacing.
14	MIDTERM EXAM 2
15	Programmable ICs, Serial Port, Motors
16	Interrupts