Details of Course

Course Title	Course Structure			Pre-Requisite
Microprocessors Architecture and Programming -B.Tech. EP IV Sem Lesson Plan	**L**	**T**	**P**	
	3	**1**	**0**	

Course Objectives

This course aims to familiarize the students with the concept of Microprocessors, memory organization, addressing modes and programing; to understand the interfacing of peripheral devices with microprocessor; and to analyse the programming of microcontrollers.

Course Outcomes (CO)

1. Recall and apply a basic concept of digital fundamentals to Microprocessor based personal computer system.
2. Design and develop 8086 Microprocessor based systems for real time applications using low level language like assembly language program.
3. Familiarise the architecture and operation of Programmable Interface Devices and realize the programming & interfacing of it with 8086 microprocessor.
4. Interface various peripheral IC's with 8086 microprocessor for its various applications
5. Analyze the architecture, operation and programming of Microcontrollers.

S. No.	Content	Contact Hours
Unit 1	Basic Concepts of Microprocessors, Introduction to 8086 Microprocessor, its internal architecture, Concept of address, data and control buses, 8086 hardware specifications: pin-outs and the pin-functions, Real Mode Memory Addressing, Introduction to protected mode memory addressing, Memory Address Space Organization, Minimum and Maximum mode.	10
Unit 2	Programming model of 8086-general purpose registers, special purpose registers and segment registers. Physical address generation, data addressing modes, program memory addressing modes, stack memory addressing modes, data transfer instructions, arithmetic and logic instructions, flag control instructions, program control instructions, Input/Output instructions.	10
Unit 3	Jump Instructions: Conditional and Unconditional; Subroutines: Call and Return Functions. Bus Cycle Timing Diagrams; Types of Interrupts, interrupt instructions, hardware interrupt interface, software interrupts, NMI interrupt.	8
Unit 4	Programmable Interrupt Controller – 8259, Programmable Peripheral Interface (PPI) - 8255, Programmable Direct Memory Access (DMA) Controller - 8237/8257, Programmable Interval Timer - 8253.	8
Unit 5	Introduction to PIC Microcontrollers, PIC microcontroller overview and features, PIC 16F8X Family: ALU, CPU registers, pin diagram, PIC reset actions, PIC oscillator connections, PIC memory organization, PIC 16F877 instructions, Addressing modes, I/O ports. Interfacing applications of Microcontroller.	6
	Total	42

Books:

S. No.	Name of Books/Authors/Publisher
1.	Y. Liu and G. A. Gibson, Microcomputer Systems: The 8086/8088 Family, 2nd Ed., Prentice Hall of India.
2.	Douglas Hall, Microprocessors Interfacing, Tata McGraw Hill.

3.	Barry B. Brey, The Intel Microprocessors, 7th Ed., Prentice Hall of India.
4.	A.K.Ray, K.M.Bhurchandi, Advanced Microprocessors and Peripherals (Second edition), TMH.
5	Walter A. Treibel and Avtar Singh, The 8088 and 8086 Microprocessors, Prentice Hall of India.
6	PIC Microcontrollers by Martin Bates.
7.	Microcontroller and Embedded systems- M.A.Mazadi, J.G.Mazadi & R.D.McKinlay - Pearson PHI.

LIST OF EXPERIMENTS: MICROPROCESSORS ARCHIECTURE AND PROGRAMMING LAB

Assembly Language Programming Based on 8086

1. Addition of two 64- bit numbers
2. Multiplication of two 16-bit numbers
3. Division of two 8-bit numbers
4. Generate Fibonacci Series less than FF
5. Generate an Arithmetic Progression (AP) Series
6. Generate a Geometric Progression (GP) Series
7. Arrange the given numbers of series in order of increasing and decreasing magnitude of numbers
8. Find the following summation: $\sum x_j^2 / n$, where x is an 8-bit number.
9. Find the factorial of an 8-bit number
10. Find the largest number in a set of 16, 8 bit numbers
11. To study 8255 Programmable Peripheral Interfacing (PPI) module using 8086.
12. To study 8253 Programmable Interval Counter (PIC) interfacing module using 8086.