JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY ANANTAPUR

B. Tech II - II sem (C.S.E)

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(15A04407) MICROPROCESSORS & INTERFACING

Course Objective:

- *Study the instruction set of 8086 microprocessor and its architecture*
- *Learn assembly language programming using 8086 microprocessor*
- *Interfacing 8051, 8255, 8237, and 8259*

Learning Outcome:

- *Program the 8086 microprocessor*
- *Interface the 8086 microprocessor with various devices and program them*

UNIT I

Microprocessors-Evolution and Introduction: Microprocessors and Micro Controllers, Microprocessor based system, Origin of Microprocessor, Classification of Microprocessors, Types of Memory, I/O Devices, Technology Improvements Adapted to Microprocessors and Computers, Introduction to 8085 processor, Architecture of 8085, Microprocessor instructions, classification of instructions, Instruction set of 8085.

Intel 8086 Microprocessor architecture, Features, and Signals: Architecture of 8086, Accessing memory locations, PIN details of 8086.

UNIT II

Addressing Modes, Instruction Set and Programming of 8086: Addressing modes in 8086, Instruction set of 8086, 8086 Assembly Language Programming, Modular Programming.

UNIT III

8086 Interrupts: Interrupt types in 8086, Processing of Interrupts by 8086, Dedicated interrupt types in 8086, Software interrupts-types 00H-FFH, Priority among 8086 interrupts, Interrupt service routines, BIOS interrupts or functional calls, Interrupt handlers, DOS services-INT 21H, System calls-BIOS services.

Memory and I/O Interfacing: Physical memory organization in 8086, Formation of system bus, Interfacing RAM and EPROM chips using only logic gates, Interfacing RAM/ EPROM chips using decoder IC and logic gates, I/O interfacing, Interfacing 8-bit input device with 8086, Interfacing output device using 8086, Interfacing printer with 8086, Interfacing 8-bit and 16-bit I/O devices or ports with 8086, Interfacing CRT terminal with 8086.

UNIT IV

Features and Interfacing of programmable devices for 8086 systems: Intel 8255 programmable peripheral interface, Interfacing switches and LEDS, Interfacing seven segment displays, Traffic light control, Interfacing analog to digital converters, Intel Timer IC 8253, Introduction to serial communication, 8259 programmable controller, 8237 DMA controller.

UNIT V

Introduction to 8051 Micro controllers: Intel‘s MCS-51 series micro controllers, Intel 8051 architecture, Memory organization, Internal RAM structure, Power control in 8051, Stack operation.

8051 Instruction Set and Programming: Introduction, Addressing modes of 8051, Instruction set of 8051, Hardware features of 8051: Introduction, Parallel ports in 8051, External memory interfacing in 8051, Timers, Interrupts, Serial ports.

Interfacing Examples: Interfacing 8255 with 8051, Interfacing of push button switches and LEDS, Interfacing of seven segment displays.

Text Books:

- *"Microprocessor and Interfacing 8086,8051, 8096 and advanced processors", Senthil Kumar,*
  Saravanan, Jeevanathan, Shah, 1st edition, 2nd impression, 2012, Oxford University Press.
- *"The X86 Microprocessors", Lyla B. Das. , 2010, Pearson.*

Reference Books:

1. *"Microprocessor and Interfacing: Programming and Hardware", Douglas V.Hall, McGrawHill*
2. *"8086 microprocessor: Programming and Interfacing the PC", Kenneth Ayala, Cengage*
   Learning
3. *"ARM system-on-chip architecture", Steve Furber, Addison-Wesley Professional*
4. *"The Intel Microprocessors", Barry B. Brey, Prentice Hall*