

16CS307 MICROPROCESSORS AND INTERFACING

Hours Per Week :

L	T	P	C
3	-	-	3

Total Hours :

L	T	P	W/RA	SSH/SHS	CS	SA	S	BS
45	-	-	20	48	4	12	2	2

Course Description and Objectives:

This course introduces basic architecture, operation and interfacing of microprocessors and microcontrollers. The objective of the course is to enable the student to understand the architecture and addressing modes of 8086/8051, importance of different peripheral devices and their interfacing to 8086/8051.

Course Outcomes:

The student will be able to:

- understand the architectures of 8086 family of microprocessors and 8051 microcontroller systems.
- select a microprocessor or microcontroller that is suitable to given application.
- write assembly language programs for 8086 processor and 8051 microcontroller.
- create the memory and I/O interfacing with 8086 and 8051.

SKILLS:

- ü *Develop assembly language programs for 8086 Microprocessor and 8051 Microcontroller.*
- ü *Design Microprocessor based system for given applications.*
- ü *Design Microcontroller based system for given applications.*

UNIT - 1**L- 09**

INTRODUCTION TO 8086 MICROPROCESSOR: Evolution of microprocessors, 8086 microprocessor, Architecture, Register model, Memory segmentation, Physical address generation, Addressing modes, Instruction set, Interrupts of 8086, Interrupt vector table.

UNIT - 2**L- 09**

HARDWARE FEATURES OF 8086: Pin configuration of 8086, 8086 system bus architecture, Minimum mode Configuration, Maximum mode configuration, System Bus Timings, Physical Memory organization, Memory Interfacing to 8086.

UNIT - 3**L- 09**

ADVANCED PROCESSORS: Real and Virtual Memory Addressing Modes, Memory Management, Memory Paging Mechanism, Cache Memory Techniques, Exception Handling, Comparison of Microprocessors (8086 – 80186 – 80286 – 80386 – 80486), Comparison of Pentium Processors.

UNIT - 4**L- 09**

INTRODUCTION TO 8051 MICROCONTROLLER: Comparison of Microprocessors and Microcontrollers, 8051 Micro controller Architecture, Signal Description of 8051, Memory organization, Addressing modes of 8051, Instruction set; Assembly language program examples in 8051.

UNIT - 5**L- 09**

8051 MICROCONTROLLER HARDWARE AND INTERFACING: Parallel Ports in 8051, 8051 Timers, 8051 Serial ports, 8051 Interrupts. LCD & Keyboard Interfacing, ADC & DAC Interfacing, Stepper Motor Interfacing, External Memory interfacing.

TEXT BOOKS:

1. Barry B. Brey, "The Intel microprocessors 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium, Pentium Pro processor, Pentium II, Pentium III, Pentium 4, and Core2 with 64-bit extensions: architecture, programming, and interfacing", 8th edition, Pearson Prentice Hall, 2009.
2. Kenneth J. Ayala, "The 8051 Microcontroller – Architecture, Programming and Applications", 3rd edition, Cengage Learning, 2008.

REFERENCE BOOKS:

1. Douglas V. Hall, "Microprocessors and Interfacing", 2nd edition, Tata McGraw Hill, 2006.
2. Mohamed Rafiquzzaman, "Microprocessors and Microcomputer Based System Design", 2nd edition, CRC Press, 2007.

ACTIVITIES:

- *Interfacing 16x2 LCD with 8051.*
- *Interfacing 4x4 Hex key pad with 8051.*
- *Interfacing stepper motor with 8051.*
- *Interfacing DAC to generate Square and Triangular waves.*
- *Interfacing ADC to convert analog signal to digital and to display it on 7-Segment LED display.*
- *Count external pulses arriving on port pins of 8051.*
- *Design microcontroller based system with more than seven peripherals.*
- *Design microprocessor based system for traffic control using 8086.*