

COURSE TITLE : **MICROPROCESSORS AND INTERFACING**
COURSE CODE : **5131**
COURSE CATEGORY : **A**
PERIODS/WEEK : **4**
PERIODS/SEMESTER : **52**
CREDITS : **4**

TIME SCHEDULE

MODULE	TOPICS	PERIODS
1	Basic 80x86 Architecture	13
2	Programming of x86 processor	13
3	Interrupt mechanism of x86 & Interfacing of chips	13
4	Advanced Processor Technologies	13

Course General Outcomes:

Sl.	G.O	On completion of this course the student will be able :
1	1	To understand Microprocessors
	2	To know the architecture of 8086 Microprocessor
2	1	To understand the Programming of 8086
	2	To understand The Instruction set of x86 Processor
3	1	To understand the Interrupt mechanism of x86
	2	Interfacing with PPI & Keyboard and Display Controllers
4	1	To understand the operating Modes of 80386
	2	To study Pentium Processor and modern technologies

Specific Outcomes:

MODULE –I Basic 80x86 Architecture

1.1 To understand Microprocessors

- 1.1.1 To describe the role of Microprocessor in Micro Computer
- 1.1.2 To list the features of 8086

1.2 To know the architecture of 8086 Microprocessor

- 1.2.1 To Explain the architecture of 8086
- 1.2.2 To describe the software architecture of 8086
- 1.2.3 To describe the Hardware structure of 8086

MODULE – II Programming of x86 processor

2.1 To understand the Programming of 8086

- 2.1.1 To Describe Assembly language programming

2.2 To understand The Instruction set of x86 Processor

- 2.2.1 To describe data transfer, branch, and arithmetic instructions
- 2.2.2 To describe logical, shift, and rotate instruction
- 2.2.3 To describe string instructions and procedures

MODULE – III Interrupt mechanism of x86 & Interfacing of chips

3.1 To understand the Interrupt mechanism of x86

- 3.1.1 To describe interrupts of 8086
- 3.1.2 To explain the different types of interrupts

3.2 To Understand different Interfacing Chips

- 3.2.1 To describe Programmable Peripheral Interfacing Chip and Interfacing with x86 processor
- 3.2.2 To explain the importance, organisation, and interfacing of Programmable Interrupt Controller
- 3.2.3 To describe Keyboard and Display Interface chip and Interfacing with x86 processor

MODULE –IV Advanced Processor Technologies

4.1 To understand the operating Modes of 80386

- 4.0.1 To list the features of 80386
- 4.1.2 To describe Real Mode & Protected Virtual Addressing Mode

4.1 To Explain Pentium Processor

- 4.1.1 To list the features of Pentium
- 4.1.2 To describe pipelining

4.2 To know the advanced technologies of modern Intel processors

- 4.2.1 To define Super scalar Architecture
- 4.2.2 To define Multicore processing
- 4.2.3 To define MMX Technology
- 4.2.4 To define Hyperthreading

CONTENT DETAILS

MODULE –I Basic 80x86 Architecture

Role of Microprocessor in Micro Computer – Brief history of Microprocessors (with specific insight into x86 family) - Features of 8086

Internal Block Diagram of 8086 – Execution Unit – Bus Interface Unit – Addressing Modes

Hardware structure of 8086- Pin Configuration-Clock- Processor activities (Interrupt, DMA, etc.)- Maximum mode- Instruction cycle

Assembly process – Assemblers for x86 – Instruction Design

MODULE – II Programming of x86 processor

Data transfer Instructions- Branch instructions- Arithmetic instructions- Shift and Rotate Instructions- String Instructions- Procedures- Macros-Number Format Conversions- ASCII operations

MODULE – III Interrupt mechanism of x86 & Interfacing of chips

Interrupts of 8086- Dedicated Interrupt types- Software interrupts-Hardware interrupts- Priority of interrupts-Programmable Interrupt Controller (8259)

Organisation and Interfacing of PPI (8255), and Keyboard and display Interface (8279)

MODULE –IV Advanced Processor technologies

Features of 80386- Real Mode - Protected Virtual Addressing Mode

Features of Pentium- pipelining- Stages of pipelining- Speedup due to pipelining- Pipeline Hazards

Super scalar Processors- Multiple Execution units

Multicore processing – Major issues in Multicore Processing (interconnects- cache coherence-snooping protocol- Directory based protocol) MMX- SSE- Hyperthreading

Note: The programming should be covered irrespective of Assembler.

TEXT BOOK(S):

1. The x86 Microprocessors- Architecture, Programming and Interfacing – Lyla B Das – Pearson- Second edition.
2. Microprocessor and Microcontroller - R. Theagarajan – SCITECH-2010

REFERENCES:

1. The 8088 and 8086 Microprocessors – Programming, Interfacing, Software and Hardware Applications by Walter A. Triebel & Avatar Singh, Pearson Fourth Edition,
2. Microprocessor 8086 Architecture, Programming and Interfacing by Sunil Mathur, PHI,2011
3. The Intel Microprocessors : Archirecture, Programming and Interfacing- Barry B. Brey Pearson -8 Edition