Int. Marks	Ext. Marks	Total Marks	L	T	P	C
40	60	100	4	1	-	3

Pre-Requisites: Digital Electronics

Course Objectives:
The student will
- Learn architecture and modes of operation of 8086 and their timing diagrams.
- Learn different addressing modes and programming of 8086.
- Understand interfacing of 8086, with memory and other peripherals.
- Learn concept of USART, DMA, Interrupt controller, Keyboard/ display controller
- Study the features of advanced processors.
- Study the features of 8051 microcontroller, its instruction set
- Study the features of PIC microcontroller, its instruction set

UNIT-I: 8086 MICROPROCESSOR:
8086 microprocessor family, Main features of 8086, register organization of 8086, 8086 internal architecture, bus interfacing unit, execution unit, signal/pin description of 8086, 8086 system timing, minimum mode and maximum mode configuration, interrupts and interrupt responses.

UNIT-II: 8086 PROGRAMMING
Program development steps, addressing modes, instruction set of 8086, assembler directives, writing simple programs with an assembler, assembly language program development tools.

UNIT-III: 8086 INTERFACING
Semiconductor memories interfacing (RAM, ROM), programmable communication interface 8251 USART, 8254 software programmable timer/counter, PIO 8255, modes of operation of 8255, interfacing to D/A and A/D converters, stepper motor interfacing, DMA Controller 8237A, Programmable interrupt controller 8259A, the keyboard/display controller 8279.

UNIT-IV: 80386 AND 80486 MICROPROCESSORS
Introduction, Salient features of 80386, programming concepts, special purpose registers, segmentation and Paging, real address mode of 80386, protected mode of 80386, virtual 8086 mode and enhanced mode, architectural differences between 80386 and 80486 microprocessors.

UNIT-V: 8051 MICROCONTROLLER
Introduction, 8051 architecture, 8051pin description, i/o ports and circuits, memory organization, counters/timers, serial data input/output, interrupts.
Assembly language programming: Instructions, addressing modes, simple programs.

UNIT-VI: PIC MICROCONTROLLER
Introduction, characteristics of PIC microcontroller, PIC microcontroller families, PIC 16F877 architecture, memory organization, parallel and serial input and output, timers, Interrupts, instruction set of PIC 16F877.

Course Outcomes:

After successful completion of the course, the students can be able to:

S. No	Course Outcome	BTL
1.	understand and apply the concepts of 8086 architecture, and different modes of operation	L2
2.	understand and apply various addressing modes of 8086 and implement programs	L2
3.	Examine the 8086 interfacing with different peripherals and can implement programs	L3
4.	understand Concepts of advanced microprocessors, different addressing modes	L2
5.	Understand and implement Features of 8051 micro-controllers ,its instruction set,& addressing modes	L2
6.	understand the Features of PIC micro-controllers ,its instruction set,& addressing modes	L2

Correlation of COs with POs & PSOs:

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO 1	2	3	3	2	-	-	-	-	2	-	-	1	2	-
CO 2	2	3	2	1	2	-	-	-	3	1	-	2	3	3
CO 3	2	-	3	2	2	-	-	-	3	2	-	1	3	2
CO 4	2	3	3	2	-	-	-	-	3	1	-	1	2	-
CO 5	2	3	3	2	3	-	-	-	2	2	-	2	3	3
CO 6	2	2	-	-	3	-	-	-	2	3	-	2	3	2

Text books:
1. A. K. Ray, K. M. Bhurchandi, "Advanced Microprocessors and Peripherals", Tata McGraw Hill Publications, 2000.
2. The 8051 Microcontroller & Embedded Systems Using Assembly and C by Kenneth J. Ayala, Dhananjay V. Gadre, Cengage Learning , India Edition.
3. Ajay V Deshmukh, "Microcontrollers", TATA McGraw Hill publications, 2012.

Reference Books:
1. Microprocessors and Interfacing – Programming and Hard ware by Douglas V Hall, SSSP Rao, Tata McGraw Hill Education Private Limited, 3rd Edition.
2. Microprocessors and Microcontrollers by N. Senthil Kumar, M.Saravanan & S.Jeevananthan, Oxford University Press, Seventh Impression 2013
3. Microprocessors and Microcontrollers-Architecture, Programming and System Design by Krishna Kant, PHI Learning Private Limited, Second Edition, 2014.