

1152AU112

MICROPROCESSOR AND MICROCONTROLLER**L T P C****3 0 0 3****1. Preamble**

This course is to make the students to understand the architecture, programming and interfacing of system design of microprocessors and microcontrollers.

2. Pre-requisite:

1150EC101 Basic Electronics Engineering

3. Links to other courses

- Automotive electrical and electronic systems.

4. Course Educational Objectives

Students undergoing this course are expected to

- Know the internal organization, addressing modes and instruction sets of 8085 processor.
- Know the various functional units of 8051 microcontroller.
- Understand embedded C and assembly language program by using 8051 Instruction sets and addressing modes.
- Know the various peripheral devices such as 8255, 8279, 8251, 8253, 8259 and 8237.
- Understand microcontroller based system design for various applications.

5. Course Outcomes

Upon the successful completion of the course, students will be able to

CO Nos.	Course Outcomes	Level of learning domain (Based on revised Bloom's)
CO1	Develop an ALP in 8085 microprocessor using the internal organization for the given specification	K2
CO2	Describe the architecture and functional block of 8051 microcontroller	K2
CO3	Develop an embedded C and ALP in 8051 microcontroller using the internal functional blocks for the given specification	K3
CO4	Explain various peripherals devices such as 8255, 8279, 8251, 8253, 8259 and 8237	K2
CO5	Explain microcontroller application like temperature control, Traffic light System, Power Windows, Wiper Control, TPMS, Throttle control and ABS	K2

6. Correlation of COs with Programme Outcomes

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	L	L	M	M	H	L							H	H
CO2	L	L	M	M	H	L							H	H
CO3	L	L	M	M	H	L							M	M
CO4	L	L	M	M	H	L							L	L
CO5	L	L	M	M	H	L							M	H

H- High; M-Medium; L-Low

7. Course content

UNIT I 8085 CPU

L-

9

8085 Architecture – Pin Diagram - Memory Interfacing – I/O Interfacing- Timing Diagram- Instruction Set - Addressing Modes – Assembly Language Programming- Comparison of 8 Bit (8085) and 16 Bit (8086) Processors.

UNIT II 8051 ARCHITECTURE

L-

9

Architecture – Memory Organization – I/O Ports and Circuits - Timers - Interrupts – Serial Communication - Interfacing of External Memory - Interfacing LCD & Keyboard - RTC.

UNIT III 8051 PROGRAMMING

L-

9

Addressing Modes - Instruction Set - Assembly Language Programming and C Programming–Timer Counter Programming – Serial Communication Programming- Interrupt Programming.

UNIT IV PERIPHERAL DEVICES

L -

9

Parallel Peripheral Interface (8255) - Timer / Counter (8253) - Keyboard and Display Controller (8279) - USART (8251) - Interrupt Controller (8259) - DMA Controller (8237).

UNIT V MICROCONTROLLER APPLICATIONS

L -

9

Temperature Control System - Motor Speed Control System – Traffic Light System – Power Windows, Wiper Control, TPMS, Throttle Control and ABS

Total: 45 periods

8. Text Books

1. Ramesh S Gaonkar, Microprocessor Architecture, Programming and application with 8085, 6th Edition, Penram International Publishing. (UNIT 1&4)
2. Muhammad Ali Mazidi , Janice Gillispie Mazidi and Rolin D McKinlay, The 8051 microcontroller and embedded systems using assembly and C, second edition Pearson education Asia.(UNIT 2 & 3)
3. Mohamed Rafiquzzaman, Microprocessor and Microcomputer based system design, second edition, CRC press (UNIT 5)

9. References

1. Kenneth J Ayala, The 8051 Microcontroller Architecture Programming and Application, third Edition, Penram International Publishers.
2. A.K Ray & K.M. Burchandi, Advanced Microprocessor and peripherals Architectures, Programming and interfacing “, second edition, Tata McGraw-Hill