

Course Code	Course Title	L	T	P	C
1151EC110	MICROPROCESSOR AND MICROCONTROLLER	3	0	0	3

**a) Course Category**

Program core

**b) Preamble**

The Purpose of the course is to provide students with the Knowledge of Microprocessors and Microcontroller. To solve real world problems in an efficient manner, this course also emphasis on architecture, Programming and system design used in various day to day gadgets.

**c) Prerequisite**

Digital Electronics

**d) Related Courses**

Embedded System Design, Embedded Processors, Embedded OS and Device Drivers

**e) Course Outcomes**

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

CO Nos.	Course Outcomes	Knowledge Level (Based on Revised Bloom's Taxonomy)
CO1	Describe the functionalities of 8085 architectures and Assembly language programming Describe the functionalities of 8086 architectures and Assembly language programming	K3
CO2	Describe the architecture and functional block of 8051 microcontroller.	K2
CO3	Program the functional units of 8051 microcontroller for the given specifications using C/Assembly language.	K3
CO4	Describe various peripheral devices such as 8255, 8279, 8251, 8253, 8259 and 8237	K2
CO5	Explain various applications using 8051 microcontroller and basic architectures of PIC, ARM and ATMEGA microprocessors and microcontrollers.	K2

**f) Correlation of COs with POs**

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

**g) Course Content**

**UNIT I 8085 AND 8086 MICROPROCESSOR 12**

Introduction to 8085 Architecture, Timing Diagram, Addressing Modes, Instruction Formats, Instruction Set. Introduction to 8086 Architecture, Features, Signals, I/O & Memory Interfacing, Addressing Modes, Instruction Formats, Instruction Set, Assembler Directives, Interrupts, Minimum Mode & Maximum Mode Operation, Assembly Language Programming.

**UNIT II 8051 ARCHITECTURE 9**

Hardware features, Architecture, Internal RAM structure, Special Function Registers, Memory Organization, I/O Ports and Circuits, Timers, Interrupts, Serial Communication, Interfacing of External Memory, Interfacing LCD & Keyboard, Real Time Clock.

**UNIT III 8051 PROGRAMMING 9**

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

**UNIT IV PERIPHERAL DEVICES 8**

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

**UNIT V MICROCONTROLLER APPLICATIONS & ADVANCED PROCESSOR 7**

Temperature Control System, Motor Speed Control System, Traffic light System, Elevator System, Data Acquisitions System, Introduction to Architecture of PIC Microcontroller, ARM Processor, ATMEGA Processor.

**Total 45 Hrs**

## **h) Learning Resources**

### **Text Books**

1. Ramesh S Gaonkar, Microprocessor Architecture, Programming and application with 8085, 6<sup>th</sup> Edition, Penram International Publishing.
2. A.K Ray & K.M. Burchandi, Advanced Microprocessor and peripherals Architectures, Programming and interfacing “, second edition, Tata McGraw-Hill .
3. Muhammad Ali Mazidi, Janice GillispieMazidi and Rolin D McKinlay, The 8051 microcontroller and embedded systems using assembly and C, second edition Pearson education Asia.

### **Reference Books**

1. Kenneth J Ayala, The 8051 Microcontroller Architecture Programming and Application, third Edition, Penram International Publishers.

### **Online Resources**

1. <https://www.youtube.com/watch?v=liRPtvj7bFU&list=PL0E131A78ABFBFDD0>
2. <https://www.youtube.com/watch?v=95uGOJ1Ud2c&list=PLJGA4olwzpA-rvcdWULcRuMn2495g0n8j>