

**III B.Tech – I Semester**  
**(20EE5009) MICRO PROCESSORS AND MICRO CONTROLLERS**

Int. Marks	Ext. Marks	Total Marks	L	T	P	C
30	70	100	3	-	-	3

**Pre-Requisites:** Analog Electronics, Digital Logic Design

**Course Objectives**

- To familiarize the organization and architecture of 8086 Micro Processor
- To apply addressing modes and instruction set to write assembly language programs for 8086.
- To familiarize 8051 micro controller architecture, Assembly language programming of 8051.
- To implement applications using 8051 microcontroller.
- To study the architecture of the PIC Microcontroller

**UNIT-I: Introduction to Microprocessors Architecture**

Introduction and evolution of Microprocessors– Architecture of 8085, Register Set, Architecture of 8086, Register organization of 8086, Memory segmentation of 8086, General bus operation of 8086, Signals and Pin configuration, Minimum mode and maximum modes.

**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: Intel 8051 Microcontroller**

Architecture, Register set, Pin configuration, hardware concepts, input/output ports and circuits, external memory, counters/timers, serial data input/output, interrupts, Instruction set, addressing modes, 8051 ALP format, simple programs.

**UNIT-IV: 8051 Interfacing**

Applications of Micro Controllers– Interfacing 8051 to LED's–Push button– Relay's – Interfacing Seven Segment Display- Liquid crystal Display- Keyboard Interfacing—ADC and DAC Interfacing –Examples of sensors and actuators.

**UNIT-V: PIC Microcontroller**

Introduction, characteristics of PIC microcontroller, PIC microcontroller families, memory organization, parallel and serial input and output, timers, Interrupts, PIC 16F877 architecture, instruction set of the PIC 16F877.

**Course Outcomes:**

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

S.No	Course Outcome	BTL
1.	Summarize different microprocessors and describe 8086 architecture.	L2
2.	Apply the addressing modes and instruction set to write 8086 microprocessor programs.	L3
3.	Understand the architecture of 8051 microcontrollers and apply assembly language programming concepts.	L2
4.	Design and develop applications using 8051 microcontroller.	L6
5.	Describe the architecture PIC Microcontroller	L1

**Correlation of COs with POs& PSOs:**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2	2	2	1	1	-	-	-	3	1	-	1	3	2
CO2	2	2	2	1	1	-	-	-	3	1	-	1	3	2
CO3	2	2	2	1	1	-	-	-	3	1	-	1	3	2
CO4	2	2	2	1	1	-	-	-	3	1	-	1	3	2
CO5	2	2	2	1	1	-	-	-	3	1	-	1	3	2

**Text Books:**

1. Microprocessors and Interfacing - Douglas V Hall - Mc-Graw Hill publications , 2nd Edition.
2. “The 8051 Micro Controller Architecture, Programming and Applications”, - Kenneth J Ayala, - Thomson Publishers, 2nd Edition.
3. Ray and Burchandi, “Advanced Micro Processors and Interfacing”, Tata McGraw-Hill publications, Second Edition, 2010.
4. 8051 microcontrollers and Embedded systems by Muhammad Ali Mazidi, Pearson Publisher, 2000
5. PIC Microcontroller and Embedded Systems using Assembly and C for PIC 18, - Muhammad Ali Mazidi, Rolind D.Mckinay , Danny causey -Pearson Publisher 21st Impression

**Reference Books:**

1. A Text book of Microprocessors and Micro Controllers”, - R.S. Kaler, I.K. International Publishing House Pvt. Ltd
2. Microcontrollers – Theory and Applications”, - Ajay V. Deshmukh, Tata McGraw-Hill Companies – 2005.
3. Microcontrollers – Principles and Applications” - Ajit Pal, PHI Learning Pvt Ltd, 2011.