III Year I Semester	L	T	P	C
Code:20IO5710	3	0	0	3

MICROPROCESSORS AND MICROCONTROLLERS FOUNDATIONS

Course objectives:

1. To understand the organization and architecture of 8086 Micro Processor
2. To understand and to apply addressing modes and instruction set to write assembly language programs for 8086.
3. To understand 8051 micro controller architecture, Assembly language programming of 8051.
4. To understand and to develop applications with 8051 microcontroller
5. To understand the PIC Microcontroller architecture.

Course Outcomes:

1. To be able to understand the microprocessor capability in general and explore the evolution of microprocessors.
2. To be able to understand and apply the addressing modes and instruction set of 8086 microprocessors to write assembly language programs.
3. To be able to understand architecture, memory organization and assembly language programming of 8051 micro controller
4. To be able to develop applications using 8051 microcontroller
5. To be able to understand PIC Microcontroller architecture

UNIT–I: Introduction to Microprocessor Architecture: Introduction and evolution of Microprocessors– Architecture of 8085, Register Set, Architecture of 8086, Register set of 8086, Memory segmentation of 8086, General bus operation of 8086, Signals and Pin configuration, Minimum mode and maximum modes, Introduction and features of 80286, 80386 and 80486 and Pentium.

UNIT-II: 8086 Programming: 8086 Instruction set, Addressing modes, Assembler directives, simple programs: multi bye addition/ subtraction/ multiplication/ division, Program development steps and development tools (MSAM).

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.

Text Books:

1. Microprocessors and Interfacing, Douglas V Hall, Mc–Graw Hill, 2nd Edition.
2. Kenneth J Ayala, "The 8051 Micro Controller Architecture, Programming and Applications", Thomson Publishers, 2nd Edition.
3. Ray and Burchandi, "Advanced Micro Processors and Interfacing", Tata McGraw–Hill.
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. R.S. Kaler, "A Text book of Microprocessors and Micro Controllers", I.K. International Publishing House Pvt. Ltd.
2. Ajay V. Deshmukh, "Microcontrollers – Theory and Applications", Tata McGraw–Hill Companies –2005.
3. Ajit Pal, "Microcontrollers – Principles and Applications", PHI Learning Pvt Ltd, 2011.