

## PEI101: MICROCONTROLLERS AND EMBEDDED SYSTEMS

L	T	P	Cr
3	1	2	4.5

**Course objective:** To understand the concepts of Hardware of various microcontrollers to enable Programming and Interfacing of microcontroller.

**8051 Microcontroller:** Architecture, TIMERS and Counters, Interrupts, Serial Communication, Addressing modes, instruction set and, Jumps, Loops, Interrupts and returns, Timers and Interrupts, I/O programming.

**PIC Microcontrollers:** Introduction to 16 and 18F families, Architecture and programming, TIMERS and Counters, Interrupts, SPI, I2C, I/O programming and interfacing.

**Hardware Interfacing:** Interfacing with LEDs, Seven Segment, Sensors, Basic concepts of LCD, ADC, DAC, Relays etc. and their interfacing to microcontroller.

**Laboratory work (if any):** Laboratory Work: PC Interfacing using RS232, Parallel port with LED, Seven Segments, LCD etc. 8051 assembler, Compilers and simulator, Programming concepts using Simulator, Microcontroller Interfacing with LEDs, Seven Segment, LCD, Sensors, ADC, DAC etc.

### Course learning outcome (CLO):

1. Learn basic hardware of various microcontrollers.
2. Assembly and programming concepts, jump and call instructions.
3. Hardware interfacing of microcontroller with led's, seven segment, sensors.
4. Introduction to 16-bit microcontrollers.

### Recommended Books:

1. Ayala J.K., *The 8051 Microcontroller: Architecture, programming and applications*, Penram International (2005) 3rd ed.
2. Mazidi,E. and Mazidi,F., *The 8051 Microcontroller and Embedded Systems, Prentice-Hall of India (2004) 2nd ed.*
3. Peatman J., *Embedded system Design using PIC18Fxxx*, Prentice Hall, 2003.

### Evaluation Scheme:

Evaluation Elements	Weightage (%)
MST	25
EST	35
Sessionals (May include Assignments/ Projects/ Tutorials/ Quizes/ Lab Evaluations)	40