

## **PEI7J002 MICROCONTROLLERS & ITS APPLICATIONS (3-0-0)**

### **BPUT Level(80%)**

#### **Module-I:(12 hrs)**

Microcontrollers and Embedded processors, Microcontroller's Architecture, Pin diagram of 8051 and basic features like Timing diagram, 8051 data types and directives, PSW register, Register bank and stack. Memory organization. Addressing modes, Arithmetic, logic instructions and their classification, Assembly language programming, Difference among various microcontrollers 8031, 8051 and 8052, 8051, 89c51, 89s52, 89s52.

#### **Module- 2: (15 Hours)**

Input/ Output Port Programming: Introduction to Port programming as Input Port and Output Port (Assembly Language Programming)

Timer Port Programming: Introduction to timers, Programming 8051 timers, Counter programming, Programming timers 0 and 1 in 8051

Serial Port Programming : Serial Communication -Hardware Description- Logical Level Converter- MAX232 ,Implementation with Real time application -Parallel communication - Parallel port basics -Pin details- Interfacing with Microcontroller-PC to MC communication. Serial port programming

Interrupts Programming : Definition for Interrupt -Interrupt types -Handling interrupts - Polling sequences-Interrupt sequences-External interrupts-Internal interrupts- Programming for interrupt based applications-Problems at interrupts-Debugging

ADC and DAC: - Basic principle , Their pin diagram; ADC(0804/0808/0809), DAC-0800 -

#### **Module-3: (13 hours)**

##### **Applications:**

Peripheral Devices Interfacing: Different peripheral device -Difference types of display units -7 Segments & its types, Principle of Operation-Common Anode mode-Common Cathode mode, 16x2 LCD -Applications- Hardware interfaces-Interfacing Circuits for LCD & LED, Switch: types of switch, Programming Seven Segment Display, LCD, LED, Switch with 8051 Microcontroller.

Keyboard Interfacing: Applications using keyboard interfacing with 8051 Microcontroller, Introduction to 8255 and 8255 interfacing with 8051.

Motor Interfacing: Motors used for Robotics controls -Stepper Motor & Stepper driver circuit -Stepper motor Bidirectional controlling of DC motor -Method to change polarity-Sample programs -Different sensors- Applications.

**Text Book:**

1. *The 8051 Microcontroller and Embedded Systems using assembly and C* by M.A. Mazidi, J.G. Mazidi, Pearson.
2. *8051 Microcontrollers- MCS 51 Family its Variants*, Satish Shah, Oxford University Press
3. *Microcontrollers [Theory and applications]* by Ajay V Deshmukh; Mc Graw Hill publication.

**Reference Books :**

1. *Microprocessors and Microcontrollers Architecture, Programming and system Design* by Krishna kant; PHI.
2. *Microprocessors and Microcontrollers* by NagoorKani, 2<sup>nd</sup> edition, McGraw Hill Publication.

TENTATIVE  
Likely to be Modified