EES-703: Micro Controllers and Its Application

Credit	L	T	P
4	**3**	**1**	**-**

UNIT-I

Introduction to PIC microcontrollers, factors to be considered in selecting a micro controller. Architecture of 8051: internal resources, pin diagram, I/O pins, ports and their internal logic circuits, counters, serial port, interrupt structure, SFRs and their addresses, watch dog timer, internal code memory, data memory, stack pointer, flags, bit addressable memory. Program memory organization, Data memory organization. Power management.

UNIT-II

Assembly /C language programming: study of instruction set of 8051, Addressing modes supported by 8051, Data transfer instructions, Arithmetic instructions, Logical instructions, Boolean instructions and Program control transfer instructions. Long Jump and short jump, call instructions. Delay programs, subroutines. Programming examples.

UNIT-III

Introduction to interrupts. External and internal interrupts 8051 micro controller, hardware and software interrupts. SFRs related to control of interrupts. Design of ISR (Interrupt Service Routine) for interrupts. Introduction to Timers and counters. Intel 8051/8052 Timers, SFRs related to timer's control: TCON, TMOD, IE,IP. Operating modes of timers, timer control and operations. Design of ISR (Interrupt Service Routine) for timers. Delay design using timers. Programming examples.

UNIT-IV

Overview of the serial communications: synchronous and asynchronous communications; simplex, full duplex and half duplex communications. Serial communication SFRs: SBUF, SCON, PCON. Modes of serial communications; Mode0, Mode1, Mode2, Mode3. Serial data format, Baud rate and Baud rate generation using Timer. Programming for serial communication; initialization steps, serial communication interrupt service subroutine. Programming examples for serial communication in various modes.

UNIT-V

Interfacing external memory, RAM and ROM, with MC-8051. Interfacing signals. Program memory interfacing, data memory interfacing. Interfacing with 8255,Interfacing Key board. Interfacing ADC and DAC. Interfacing dc motor; direction control, speed control. Interfacing stepper motor; full step rotation, step angle control, direction control, speed control. Interfacing servo motor; features of servo motor, direction control, speed control. Some programming examples of each.

TEXT/REFFERENCE BOOKS

1. Mohammad Ali Mazidi, the 8051 Microcontroller and embedded systems, Pearson Education
2. Kenneth Ayala, the 8051 Microcontroller Architecture, Programming and Applications, 2nd Ed. Penram International.
3. Ajay Deshmukh, Microcontrollers [Theory and Applications], Tata McGraw Hill.