Semester IV

ELECTRONICS-DSC 1D: MICROPROCESSOR AND MICROCONTROLLER

(Credits: Theory-04, Practicals-02)
Theory: 60 Lectures

UNIT I

Microcomputer Organization&Architecture: Input/Output Devices. Data storage (idea of RAM and ROM).Computer memory.Memory organization & addressing.Memory Interfacing.Memory Map.Main features of 8085. Block diagram. Pin-out diagram of 8085. Data and address buses.Registers.ALU. Stack memory. Program counter.

(15 Lectures)

UNIT II

8085 Programming : Instruction classification, Instructions set (Data transfer including stacks. Arithmetic, logical, branch, and control instructions). Subroutines, delay loops. Timing & Control circuitry.Timing states.Instruction cycle, Timing diagram of MOV and MVI. Hardware and software interrupts.

(15Lectures)

UNIT III

8051 Microcontroller Architecture: Introduction and block diagram of 8051 microcontroller, architecture of 8051, overview of 8051 family, 8051 assembly language programming, Program Counter and ROM memory map, Data types and directives, Flag bits and Program Status Word (PSW) register, Jump, loop and call instructions.
Introduction of I/O port programming, pin out diagram of 8051 microcontroller, I/O port pins description & their functions, I/O port programming in 8051 (using assembly language), I/O programming: Bit manipulation.

(15 Lectures)

UNIT IV

8051 Programming: 8051 addressing modes and accessing memory locations using various addressing modes, assembly language instructions using each addressing mode, arithmetic and logic instructions, 8051 programming in C: for time delay & I/O operations and manipulation, for arithmetic and logic operations, for ASCII and BCD conversions.
Introduction to embedded systems.Architecture, Classifications & applications of embedded systems.

(15 Lectures)

Recommended Books:

- Microprocessor Architecture Programming & applications with 8085, 2002, R.S. Goankar, Prentice Hall.
- Embedded Systems: Architecture, Programming & Design, Raj Kamal, 2008, Tata McGraw Hill
- The 8051 Microcontroller and Embedded Systems Using Assembly and C, M.A. Mazidi, J.G. Mazidi, and R.D. McKinlay, 2nd Ed., 2007, Pearson Education India.
- Microprocessor and Microcontrollers, N. Senthil Kumar, 2010, Oxford University Press
- 8051 microcontrollers, Satish Shah, 2010, Oxford University Press.
- Embedded Systems: Design & applications, S.F. Barrett, 2008, Pearson Education India

Semester IV

ELECTRONICS LABORATORY DSC 1D:

LAB: MICROPROCESSOR AND MICROCONTROLLER

60 Lectures

At least 09 experiments

Programs using 8085 Microprocessor

1. Addition and subtraction of numbers using direct addressing mode
2. Addition and subtraction of numbers using indirect addressing mode
3. Multiplication by repeated addition.
4. Division by repeated subtraction.
5. Handling of 16-bit Numbers.
6. Use of CALL and RETURN Instruction.
7. Block data handling. 8. Other programs (e.g. Parity Check, using interrupts, etc.).

Experiments using 8051 microcontroller:

8. To find that the given numbers is prime or not.
9. To find the factorial of a number.
10. Write a program to make the two numbers equal by increasing the smallest number and decreasing the largest number.
11. Use one of the four ports of 8051 for O/P interfaced to eight LED's. Simulate binary counter (8 bit) on LED's
12. Program to glow the first four LEDs then next four using TIMER application.
13. Program to rotate the contents of the accumulator first right and then left.
14. Program to run a countdown from 9-0 in the seven segment LED display.
15. To interface seven segment LED display with 8051 microcontroller and display 'HELP' in the seven segment LED display.