Subject Code : SIJ1:3

MICROCONTROLLER AND DIGITAL SIGNAL PROCESSING.

Unit I: Introduction to Microcontroller.

Intel 8051 Microcontroller Block diagram – pin out-oscillator and clock-program counter and data pointer, A and B registers, flags and program Status word-Internal RAM-The stack and stack pointer-special function registers.

Unit II: Counters, Timers and Addressing Modes.

Internal ROM-I/0 pins, ports and circuits-External Memory. Timer Counter Interrupts- Timing – Timer Modes of operation-Counting-Addressing modes-Immediate addressing mode-Register Addressing mode-Direct Addressing mode-Indirect-Addressing mode.

Unit III : Instruction Set and Simple Programs.

Data Exchanges-Logical operations-Byte level logical operations-Bit level logical operations-Rotate and swap operations-arithmetic operations-Jump and call instructions-the jump and call program range-jumps-calls and subroutines-interrupts and Returns-Example programs for 8 Bit Addition, Subtraction, Multiplication, Division and Block transfer.

Unit IV: Digital Signal Processing.

Clssification of signals-classification of systems-sample manipulation of discrete time systems-representations of different systems-linear constant coefficient difference equations .

Unit V: Transforms and Filters.

Z-transform – Definition-Properties and applications - Inverse Z transform. Discrete Fourier transform-properties and applications-Fast Fourier transform –definition - Decimation in time FFT algorithm (Radix 2 FFT only). Introduction to FIR. Filter windowing-Kaiser window.

Books for Study:

1. The 8051 microcontroller architecture, programming and application-II Edition – Kenneth J.Ayala, Penram International
2. Digital Signal Processing, S. Salivahanan, A Vallavaraj, Tata McGraw Hill

Books for Reference:

1. Digital Signal Processing by A.V.Oppenheim and R.W Schaffer, Tata McGraw Hill.
2. Digital Signal Processing, Ramachandran., Anuradha Publications.