Subject Code : P8APE2

ELECTIVE COURSE – II
MICROCONTROLLER AND DIGITAL SIGNAL PROCESSING

Unit-I 8051 Microcontroller Architecture

Microprocessors and microcontrollers-8051 architecture- microcontroller hardware-program and data memory-External memory- counters- timers- serial data I/O-interrupts

Unit-II 8051 Microcontroller Instructions and Simple programs

Addressing modes- Instructions – data transfer instructions- logical- arithmetic- jump and call instructions- bit manipulation -Addition- sum of N numbers, Multibyte addition- subtraction- multiplication-division-biggest and smallest numbers.

Unit –III Discrete time signals and Linear system

Block diagram of DSP system – Advantages and disadvantages- applications of DSP-Classification of signals – signal representation – standard discrete time signals – Classification of discrete time signals – operation on signals – Discrete time system – analog to digital conversion

Unit – IV DFT and FFT

Discrete Fourier transform – Properties of FFT – Linear and circular convolution – Filtering long duration sequence FFT – Decimation in time algorithm and frequency algorithm

Unit – V FIR and IIR filters

Magnitude and phase response of digital filters – frequency response of LPFIR filters-IIR filter design by approximate of derivatives by impulse invariant method and by Bilinear transformation – Butterworth - Chebyshew – Inverse Chebyshew and Elliptic filters

Books for Study

1. Kenneth J.Ayala, The 8051 microcontroller, architecture, programming and applications, Thomson, Delmar Learning (ISE). (2004). (Unit-I &II).
2. P.Ramesh Babu, Digital Signal Processing, Scientech Publishing Pvt., Ltd., Chennai, (2003). (Unit III, IV & V)

Book for Reference

1. Muhammad Ali Mazidi, Janice Gillispie Mazidi, The 8051 microcontroller and Embedded system, Pearson Education, (2004).
2. Sanjit K. Mitra, Digital Signal Processing – A Computer based Approach, Tata McGraw Hill Publishing Ltd., New Delhi. (2003)