

**IT9151            ADVANCED DIGITAL SIGNAL PROCESSING**

**L T P C**  
**3 0 0 3**

**UNIT I**

**9**

Basic elements of DSP – concepts of frequency in Analog and Digital Signals – sampling theorem – Discrete – time signals, systems – Analysis of discrete time LTI systems – Z transform – Convolution (linear and circular) – Correlation.

**UNIT II**

**9**

Introduction to DFT – Properties of DFT – Filtering methods based on DFT – FFT Algorithms - Decimation – in – time Algorithms, Decimation – in – frequency Algorithms – Use of FFT in Linear Filtering – DCT-wavelets

**UNIT III**

**9**

Structures of IIR – Analog filter design – Discrete time IIR filter from analog filter – IIR filter design by Impulse Invariance, Bilinear transformation, Approximation of derivatives – (HPF, BPF, BRF) filter design using frequency translation

**UNIT IV**

**9**

Structures of FIR – Linear phase FIR filter – Filter design using windowing techniques, Frequency sampling techniques – Finite word length effects in digital Filters

**UNIT V**

**9**

Multirate signal processing – Speech compression – Adaptive filter – Musical sound processing – Image enhancement.

**TOTAL = 45**

**REFERENCES**

1. John G. Proakis & Dimitris G.Manolakis, "Digital Signal Processing – Principles, Algorithms & Applications", Fourth edition, Pearson education / Prentice Hall, 2007.
2. Emmanuel C..Ifeachor, & Barrie.W.Jervis, "Digital Signal Processing", Second edition, Pearson Education / Prentice Hall, 2002.
3. Sanjit K. Mitra, "Digital Signal Processing – A Computer Based Approach" ,Tata McGraw Hill, Third Edition, 2007 .
4. Alan V.Oppenheim, Ronald W. Jchafer & Hohn. R.Back, "Discrete Time Signal Processing", PHI / Pearson Education, Second Edition, 2001.
5. Andreas Antoniou, "Digital Signal Processing", Tata McGraw Hill.
6. Michael weeks "Digital signal processing using matlab and wavelets" Infinity Science press