(EC517) Advanced Digital Signal Processing
(Elective-II)

Objective of the Course :

This is a Perfect introductory course for undergraduate students of Electronics and Communication Engineering. This course covers essential topics such as currents and power supplies, principles of working of various electronic devices, wired and wireless electronics, principles of electronic communication, measurement and monitoring.

UNIT- I

Multi rate Signal Processing: Introduction, sampling an signal reconstruction, sampling Rate Conversion, Decimation by an Integer Factor, Interpolation by an Integer Factor, Sampling Rate Conversion by a Rational Factor, Sampling Rate Converter as a Time Variant system, Practical Systems for Decimators and Interpolators, Direct Form and Poly-Phase FIR Structures with Time varying Coefficients.

UNIT- II

Multi rate FIR filter design: Design of FIR Filters for Sampling Rate Conversion, Multistage Implementation of Sampling Rate Conversion, Applications of Interpolation and Decimation in Signal Processing Operations, Low-Pass and Band-Pass Filters

UNIT - III

Filter Bank implementation, Sub-Band Processing, Decimated Filter Banks, Two Channel Filter Banks, Tree structured Filter Banks, Octave-Band Filter Banks, Uniform DFT Filter Banks.

UNIT- IV

Estimation of Spectra from Finite Duration Observations of a Signal, the Period gram, Use DFT in power Spectral Estimation, Bartlett, Welch and Blackman, Turkey methods, Comparison of performance of Non-Parametric Power Spectrum Estimation Methods.

UNIT - V

Parametric Methods for power spectrum estimation, Relationship between Auto -Correlation and Model Parameters, AR(Auto-Regressive) Process

and Linear prediction, Yule-Walker, Burg and Unconstructrained Least Squares Methods, Sequential Estimation, Moving Average(MA) and ARMA Models Minimum Variance Method, Piscaranko's Harmonic Decomposition Method, MUSIC Method.

Text Books:

1. ProakisJG and Manolakis DG "Digital Signal Processing Principles, Algorithms and applications", PHI
2. Openheim AV & Schafer RW, "Discrete Time Signal Processing", PHI.
3. Orfanadis S, "Introduction to Digital Signal Processing", PHI
4. Orfanadis S Optimum "Signal Processing", PHI