13-EC521 **ADVANCED DIGITAL SIGNAL PROCESSING**

SYLLABUS

Multirate Digital Signal Processing Introduction, Decimation by a Factor D, Interpolation by a Factor I, Sampling Rate Conversion by a Rational Factor I/D, Filter Design and Implementation for sampling rate Conversion **Multirate Digital Signal Processing** Multistage Implementation of Sampling Rate Conversion, Applications of Multirate Signal Processing, Sampling Rate Conversion of Bandpass Signals **Linear Prediction And Optimum Linear Filters**: Innovations Representation of a Stationary Random Process, Forward and Backward linear prediction, Solution of the Normal Equations, Properties of linear prediction-Error Filter, AR Lattice and ARMA Lattice-Ladder Filters. **Power Speciral Estimation:** Estimation of Spectra from Finite Duration Observations of a signal, the Periodogram, Use DFT in power Spectral Estimation, Bartlett, Welch and Blackman, Tukey methods, Comparison of performance of Non-Parametric Power Spectrum Estimation Methods **Parametric Method Of Power Spectrum Estimation:** 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 Methods, MUSIC Method**.**

TEXT BOOKS

1.Proakis JG and Manolakis DG Digital Signal Processing Principles, Algorithms and Application, PHI.
2.Openheim AV & Schafer RW, Discrete Time Signal Processing PHI.

SIMULATION TEXT BOOKS

1.Samuel D Stearns, "Digital Signal Processing with examples in Matlab. " CRC Press.
2.ES Gopi. "Algorithm collections for Digital Signal Processing Applications using Matlab, " Springer.
3.Taan S.Elali, "Discrete Systems and Digital Signal Processing with Matlab, " CRC Press,2005.