13EC537 **DETECTION AND ESTIMATION OF SIGNALS**

SYLLABUS

Introduction to Discrete-time signals: Fourier Transform of a discrete time signal, Amplitude and phase spectrum, Frequency content and sampling rates, Transfer function, Frequency response. **Random - Discrete-time signals:** Review of probability, Random data, Generation of Pseudo-random noise, Filtered signals, Autocorrelation and power spectral density, Sampling band- Limited random. **Detection of Signals in Noise**:- Minimum probability of Error Criterion, Neyman-Person criterion for Radar detection of constant and variable amplitude signals, Matched filters, Optimum formulation, Detection of Random signals, Simple problems thereon with multi sample cases. **Estimation of Signals in Noise**: Linear mean squared estimation, Non linear estimates, MAP and ML estimates, Maximum likelihood estimate of parameters of linear system, Simple problems thereon. **Recursive linear mean squared Estimation**: Estimation of a signal parameter, Estimation of time-varying signals, Kalman filtering, Filtering signals in noise, Treatment restricted to two variable case only, Simple problems.

TEXT BOOKS

1.Signal processing: Discrete Spectral analysis, Detection and Estimation, Mischa Schwartz and Leonard Shaw, Mc-Graw Hill Book Company, 1975.
2.Signal Detection and Estimation, 2nd edition, Mourad Barkat, Artech House Inc, Norwood, MA 02062, 2005,
3.Fundamentals of Statistical Signal Processing: Estimation Theory, Steven M. Kay, Prentice Hall New Jersey, 1993,

REFERENCE TEXT BOOK

1."Probability, Random Variables and Random Signal Principles", *Peyton Z.Peebles* Jr, 4th Edition, Tata Mc Graw Hill.
2.Jerry M. Mendel, Lessons in Estimation Theory for Signal Processing, Communication and Control, Prentice Hall Inc., 1995.
3.Shanmugam and Breipohl, 'Detection of signals in noise and estimation', John Wiley & Sons, New York, 1985.
4.Srinath, Rajasekaran & Viswanathan, Introduction to statistical Signal processing with Applications, Prentice Hall of India, New Delhi, 110 001,1989.
5.Steven M. Kay, Intuitive Probability and Random Processes using Matlab, Springer, 2006.

SIMULATION TEXT BOOKS

1.Statistical Digital Signal Processing and Modeling by Monson Hayes, John Wiley & Sons, Inc.,
2.Statistical Signal Processing Modelling and ESTIMATION BY Chonavel, T., Springer 2001