EC 341 DIGITAL SIGNAL PROCESSING 3 credits [3-0-0]

Introduction: Signals, systems and signal processing, concept of frequency in continuous and discrete time signal; **Discrete-time Signals and Systems:** Discrete time signals and systems, analysis of LTI system and implementation, correlation; **Z-transform:** Review, Analysis of LTI system in z-domain. ; **Frequency Domain Analysis:** Frequency analysis of continuous-time and discrete-time signals and LTI systems, LTI system as frequency selective filter, inverse system and de-convolution. ; **Discrete Fourier Transform:** Properties and Applications, Analysis using DFT; **Fast Fourier Transform Algorithms:** FFT algorithms and Applications, linear filtering approach to computation of DFT; **Implementation of Discrete-Time System:** FIR system, IIR system, representation of numbers, quantization of filter coefficients, round-off effects; **Design of Digital Filters:** Design of FIR and IIR filters, **Recent Developments.**

Essential Reading:

1. J.G. Proakis and D.G. Manolakis - *Digital Signal Processing: Principles Algorithms and Applications*, Pearson Education, 2005

Supplementary Readings:

1 A.V. Oppenheim, R.W. Schafer - *Digital Signal Processing*, Pearson Education, 2004

2 S.K. Mitra - *Digital Signal Processing: A computer based approach*, TMH, 2001

3. L. R. Rabiner and B. Gold – *Theory and Application of Digital Signal Processing,* Pearson Education, 2004