**13EC2101**-**SIGNALS AND SYSTEMS**

(Common to EEE& ECE)

Credits: 4

Lectures/Week: 4Hrs. Sessional Marks: 40

Univ.Exam.Duration: 3Hrs Univ.Exam.Marks: 60

**UNIT – I**

**Continuous Time Signals:** Signal classification – Dirac delta-types of signals unit sep, ramp, sign and exponential functions – Operations on signals- Analogy between vectors and signals – Orthogonality – Mean square error – Computation of moments, energy power, periodicity - power and energy spectral densities – Auto and cross correlation signals.

**UNIT – II**

**Fourier series**: Definition-Dirichlet’s conditions –classification of Fourier Series-properties

of Fourier Series.

Fourier transform: Existence of Fourier Transform- Properties of Fourier Transform-Inverse Fourier transforms. Parseval’s Theorem of Energy and Power signals.

**UNIT – III**

**Continuous Time Systems:** Classification of systems – Linearity and time invariance – Transmission of signals through LTI systems – Convolution – Impulse response – Frequency response – Ideal filters – Distortion less transmission – Band Width – Rise time – Hilbert transform – Pre and complex envelopes – Band pass signals through band pass systems.

**UNIT – IV**

**Discrete Time Signals and Systems:** Unit impulse, step, ramp, and exponential signals – Periodicity of signals – Operations of signals – Linear Shift Invariant(LSI) system – Stability – Causality – Convolution and Correlation –Linear constant coefficient difference equation – Impulse response – Discrete time Fourier transform – Properties – Transfer function – System analysis using DTFT.

**UNIT-V**

**MATLAB**: Introduction –Basic operations on Matlab –generation of signals –correlation- Convolution-Computation of Fourier Transform-Solving difference equations. Computation of Z-Transform.

**Text Books:**

1. Oppenheim. A.V, Wilekey, A.S.and Young, I.T. “Signals and Systems, PHI
2. Simon Haykin. “ Communication System”, Wiley Eastern Ltd., New Delhi.
3. Sanjith k.Mithra Digital Signal Processing with MATLAB, TMH Publications.

**References:**

1. Ashok Ambardar, “Analog and Digital Signal Processing”, Thomson Learning Inc.

2. B.P. Lathi, “Signals, Systems and Communications”, B.S. Publications.