Signal and System

Paper Code	**CEN-306**
Course Credits	**4**
Lectures / week	**3**
Tutorial / week	**1**
Course Description	**UNIT – I**

REPRESENTATION OF DISCRETE AND CONTINUOUS TIME SIGNAL AND SYSTEM

Introduction of signal& classification of signal, Elementary signals, System &classification of system, order of system, Interconnection of system-series or cascade interconnection of subsystem, parallel interconnection of subsystem, series-parallel interconnection of subsystem, feedback interconnection of subsystem, Continuous time and discrete time signals. Representation and classification; continuous time and discrete time systems, representation of linear Time invariant Discrete and continuous time signals: Laplace transformation and its application in system analysis.

UNIT- II

ANALYSIS OF CONTINUOUS TIME SIGNALS AND SYSTEMS

Fourier series Representation of periodic signals; Response to periodic Signals, Fourier transform and its properties, Inverse Fourier. Transforms; frequency response function, Computation of response from the Fourier Transform; Bandwidth Concept; Analysis of Ideal Filters.

UNIT- III

Z- transform and properties, Inverse Z- Transform; Frequency response of discrete time system; Discrete Fourier transform and its properties; System analysis via DFT

UNIT- IV

Sampling, Nyquist rate and Nyquist interval ,Sampling of continuous

and discrete signals in time and frequency; Digital filters and FIR and IIR structures and their Realization, FIR filters, IIR Filters.

UNIT – V

Random variables: probability distribution and density function and density functions, Uniform, Gaussian, Exponential and Poisson distributions, Statistical averages, Stochastic process, Systems with Stochastic Inputs; Auto and cross correlation functions; Power spectral density, Noise- Its types

References / Text Books:

- A.V. Oppenheim, A.S. Willsky and I.T. Young, "Signals and Systems", Prentice Hall.
- R.F. Ziemer, W.H. Tranter and D.R. Fannin, "Signals and Systems - Continuous and Discrete", 4th edition, Prentice Hall.
- B.P. Lathi, "Signal Processing and Linear Systems", Oxford University Press.
- Douglas K. Lindner, "Introduction to Signals and Systems", Mc-Graw Hill International Edition.
- Simon Haykin, Barry van Veen, "Signals and Systems", John Wiley and Sons(Asia) Private Limited.
- Robert A. Gabel, Richard A. Roberts, "Signals and Linear Systems", John Wiley and Sons (SEA) Private Limited.
- M. J. Roberts, "Signals and Systems - Analysis using Transform methods and MATLAB" Tata Mc Graw Hill Edition.
- I. J. Nagrath, S. N. Sharan, R. Ranjan, S. Kumar, "Signals and Systems", Tata Mc Graw Hill Publishing Company Ltd., New Delhi.
- Ashok Ambardar, "Analog and Digital Signal Processing", Second Edition, Brooks/ Cole Publishing Company (An international Thomson Publishing Company).

Computer Usage / Software Requires:

e.g. MATLAB