SIGNALS AND SYSTEMS

Course Code	20EE3302	**Year**	II	**Semester**	I
Course Category	Program Core	**Branch**	EEE	**Course Type**	Theory
Credits	3	**L-T-P**	3-0-0	**Prerequisites**	Nil
Continuous Internal Evaluation:	30	**Semester End Evaluation:**	70	**Total Marks:**	100

Course Outcomes	
Upon successful completion of the course, the student will be able to	
CO1	**Identify** different characteristics of signals and systems (L2).
CO2	**Apply** different signal operations to characterize systems (L3).
CO3	**Apply** the various transform techniques to evaluate periodic and aperiodic signals (L3).
CO4	**Analyse** the various continuous and discrete-time signals using various transform techniques (L4).

Contribution of Course Outcomes towards achievement of Program Outcomes & Strength of correlations (3:High, 2: Medium, 1:Low)

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2								2	2			1	
CO2	3								2	2			2	1
CO3	3								2	2			2	1
CO4		3							3	3			2	1

Syllabus		
Unit No.	**Contents**	**Mapped CO**
I	**Signals and Systems:** Continuous-time and Discrete-time signals, Transformations of the independent variable, Exponential and Sinusoidal signals, The unit impulse and unit step functions, Continuous-time and Discrete-time systems, Basic System properties.	CO1, CO2
II	**Linear Time Invariant Systems(LTI systems):** Discrete-time LTI systems, The convolution sum, Continuous time LTI systems, The convolution Integral, Properties of Linear Time-Invariant Systems.	CO1,CO2
III	**Fourier analysis of Continuous Time Signals and Systems:** Fourier series representation of continuous time periodic signals, convergence of the Fourier series, Properties of continuous-time Fourier series. The Continuous-Time Fourier Transform: The Fourier transform for periodic signals. Properties of the Continuous-time Fourier transform, Systems characterized by	CO1, CO3, CO4

	linear constant-coefficient differential equations.	
IV	**Fourier analysis of Discrete Time Signals and Systems:** The Discrete-Time Fourier Transform, Properties of the Discrete-time Fourier transform, The Fourier transform for periodic signals. Systems characterized by linear constant-coefficient difference equations.	CO1, CO3, CO4
V	**Analysis of Continuous time and Discrete time signals using Laplace Transform and Z Transform:** The Laplace Transform: The Region of convergence for Laplace transforms, the Inverse Laplace transform, Properties of the Laplace transform. The Z-Transform: The Region of Convergence for the Z-transform, The Inverse Z-transform, Properties of the Z-transform.	CO1, CO3, CO4

Learning Resources
Text Books
1. Alan V. Oppenheim, Alan S. Wilsky with S.Hamid Nawab, 'Signals and Systems', 2/e, Pearson Education, 1997.
Reference Books
1. Simon Haykin, Barry Van Veen, 'Signals and Systems', 2/e, Wiley Student Edition. 2. Bhagawandas P. Lathi, 'Linear Signals and Systems', Oxford University Press, 2009. 3. Signals and Systems using MATLAB, Kindle Edition, Luis Chaparro
e- Resources & other digital material
1. http://www.cdeep.iitb.ac.in/nptel/Electrical%20&%20Comm%20Engg/Signals%20and%20System/TOC-M1.htm 2. http://www.cdeep.iitb.ac.in/nptel/Electrical%20&%20Comm%20Engg/Signals%20and%20System/Course%20Objective.htm. 3. http://www.stanford.edu/~boyd.ee102 4. http://www.ece.gatech.edu/users/bonnie/book 5. http://ocw.mit.edu