C. U. SHAH UNIVERSITY
Wadhwan City

FACULTY OF: - Technology & Engineering
DEPARTMENT OF: -Electrical Engineering
BRANCH: Electrical & Electronics Engineering
SEMESTER: - VII
CODE: -   4TE07LSS1
NAME – Linear Signals & Systems

Teaching & Evaluation Scheme

Subject Code	Name of the Subject	Teaching Scheme (Hours)				Credits	Evaluation Scheme							
							Theory				Practical (Marks)			
		Th	Tu	Pr	Total		Sessional Exam		University Exam		Internal		University	Total
							Marks	Hrs	Marks	Hrs	Pr/Viva	TW	Pr	
4TE07LSS1	Linear Signals & Systems	4	0	2	6	5	30	1.5	70	3	--	20	30	150

OBJECTIVES:
- To make student understand regarding Linear Signal and Systems and its characteristics.
- To study regarding various Analysis Techniques of LTI System in various domains.

PREREQUISITES:
- Basic Concept of Differential equations, difference equation and Fourier Transforms.

Course Outlines

Sr. No.	Course Contents	Hours
1	**Introduction:** Size of a signal, Some useful Signal Operations, classification of Signals, some Useful Signal models, even and Odd Functions, Systems, classification of Systems, System Model: Input-Output Description.	06
2	**Time-Domain Analysis Of Continuous-Time Systems:** Introduction, System Response to Internal Conditions: The Zero-Input Response, the Unit Impulse Response h (t), System Response to External Input: Zero-State Response, Classical Solution of Differential Equations, System Stability, Intuitive Insights into System Behaviour.	10
3	**Time-Domain Analysis Of Discrete-Time Systems:** Introduction, Useful Signal Operations, Some Useful Discrete-Time Signal	10

	Models, Examples of Discrete-Time Systems, Discrete-Time System Equations, System Response to External Input: The Zero-State Response.	
4	**Discrete-Time System Analysis Using The Z-Transform:** The z-Transform, Some Properties of the z-Transform, z-transform solution of linear difference equations, System Realization, Frequency response of discrete time systems, Frequency response from pole zero location, Digital processing of analog signals, Connection between the Laplace Transform and z – transform, Bilateral z – transform.	10
5	**Continuous Time Signal Analysis: The Fourier Transform:** Aperiodic signal representation by Fourier integral Transforms of some useful functions, some properties of Fourier transform, Signal transmission through LTIC systems, Ideal & practical filters, signal energy, application to communications: amplitude modulation, data truncation: window functions.	10
6	**Sampling: The Bridge From Continuous To Discreet:** The sampling theorem, signal reconstruction, analog to digital conversion, dual of timing sampling: spectral sampling, numerical computation of the Fourier transform: the discrete Fourier transform, Fast Fourier transform.	10

Learning Outcomes

The students will be able to model LTI systems and do the analysis of the same in time and frequency domain and will also learn the concepts of conversion of signals from continuous domain to discreet domain.

Books Recommended:

1. " Signals and Systems: by Alan V. Oppenheim and Alan S. Willsky PHI
2. "Signals and Systems", by I. J. Nagrath, S. N. Sharan, R. Ranjan, S. Kumar, Tata Mc Graw Hill Publishing Company Ltd.
3. "Signal Processing and Linear Systems", by B.P. Lathi Oxford University Press.