



C.U.SHAH UNIVERSITY

FACULTY OF: Technology & Engineering

DEPARTMENT OF: Instrumentation & Control Engineering

SEMESTER: V

COURSE: B.Tech

SUBJECT CODE: 4TE05SAS1

SUBJECT NAME: SIGNALS AND SYSTEMS

Teaching & Evaluation Scheme

Subject Code	Subject Name	Teaching Hours/Week				Credits	Evaluation Scheme/Semester							
		Th	Tu	Pr	Total		Theory				Practical			Total Marks
							Sessional Exam		University Exam		Internal		University	
							Marks	Hrs	Marks	Hrs	Pr/Viva	TW	Pr	
4TE05SAS1	SIGNALS AND SYSTEMS	4	0	2	6	5	30	1.5	70	3	--	20	30	150

OBJECTIVES:

1. To introduce the student to the idea of signal and system analysis and characterization.
2. To provide a foundation to numerous other courses that deal with signal and system concepts directly or indirectly: viz: communication, control, instrumentation, and so on.

PREREQUISITES:

1. Basics of mathematics.

COURSE OUTLINES:

Sr. No.	Course Contents	No Of Hours
1	SIGNALS AND SYSTEMS: Introduction to signals and systems, continuous-time and discrete-time systems, transformations of independent variables, basic signals, continuous-time and discrete-time systems, basic system properties.	08
2	LINEAR TIME INVARIANT SYSTEMS: Continuous-time and discrete-time LTI systems, properties of LTI systems, singularity functions.	10
3	FOURIER SERIES AND FOURIER TRANSFORM: Fourier series representation of continuous-time and discrete-time periodic signals, the continuous time Fourier transform, properties, convolution property, multiplication property, system characterized by linear constant co-efficient differential equation, discrete time Fourier transform, properties, convolution and multiplication property, duality, system characterized by linear constant co-efficient differential equation.	12

4	THE LAPLACE TRANSFORM: Laplace transform, region of convergence, inverse Laplace transform, geometric evaluation of the Fourier transform from the pole-zero plot, properties of Laplace transform, unilateral Laplace transform.	8
5	THE Z-TRANSFORM: Introduction, region of convergence, the inverse z-transform, geometric evaluation of the Fourier transform from the pole-zero plot, properties of Z-transform, unilateral Z-transform.	8
6	SAMPLING: Introduction, the sampling theorem, the effect of undersampling-aliasing, reconstruction of signal from its samples using interpolation.	6

Learning Outcomes:

After the completion of this course the students would be able to:

- understand the representations and classifications of the discrete time signals and systems
- analyze the linear time invariant systems in time domain
- understand and apply the concepts of filtering and signal distortion

Books Recommended:

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