DISCIPLINE: Electrical & Electronics Engg.	SEMESTER: 6th Semester	NAME OF THE TEACHING FACULTY: Ms. Deepika Sarkar Lecturer -II in ETC
SUBJECT: DIGITAL SIGNAL PROCESSING (TH-3)	NO OF DAYS/PER WEEK CLASSES ALLOTTED: 05 (04-L+01-T)	SEMESTER START DATE :22/12/2025 TO DATE: 18/04/2026 NO OF WEEKS:15

Week	Class Day	Topics
	BASICS OF DIGITAL ELECTRONICS	
		Introduction of Signals, Systems & Signal processing
1st	1st	Basics of Signals, Systems & Signal processing- basic element of a digital signal processing system.
	2nd	Compare the advantages of digital signal processing over analog signal processing.
	3rd	Classify signals - Multi channel& Multi-dimensional signals Continuous time verses Discrete -times Signal.
	4th	Continuous valued verses Discrete -valued signals
	5th	Tutorial class
2nd	1ST	Concept of frequency in continuous time & discrete time signals Continuous-time sinusoidal signals-Discrete-time sinusoidal signals-Harmonically related complex exponential.
	2ND	Concept of frequency in continuous time & discrete time signals Continuous-time sinusoidal signals-Discrete-time sinusoidal signals-Harmonically related complex exponential.
	3RD	Analog to Digital & Digital to Analog conversion & explain the following. a. Sampling of Analog signal, b. The sampling theorem
	4TH	Analog to Digital & Digital to Analog conversion & explain the following. a. Sampling of Analog signal, b. The sampling theorem
	5th	Tutorial class
3rd	1st	Quantization of continuous amplitude signals, Coding of quantized sample. Digital to analog conversion. Analysis of digital systems signals vs. discrete time signals systems.
	2nd	Quantization of continuous amplitude signals, Coding of quantized sample. Digital to analog conversion. Analysis of digital systems signals vs. discrete time signals systems.
		DISCRETE TIME SIGNALS & SYSTEMS.
	3rd	Concept of Discrete time signals. Elementary Discrete time signals.
	4th	Classification Discrete time signal. Simple manipulation of discrete time signal
	5th	Tutorial
4th	1ST	Discrete time system. Input-output of system. Block diagram of discrete- time systems
	2ND	Classify discrete time system.

		Inter connection of discrete -time system
	3RD	Discrete time time-invariant system. Different techniques for the Analysis of linear system. Resolution of a discrete time signal in to impulse.
	4TH	Response of LTI system to arbitrary inputs using convolution sum. Convolution & interconnection of LTI system - properties. Study systems with finite duration and infinite duration impulse response
	5th	Tutorial
5th	1ST	Discrete time system described by difference equation.
	2ND	Recursive & non-recursive discrete time system.
	3RD	Determine the impulse response of linear time invariant recursive system
	4TH	Correlation of Discrete Time signals
	5th	Tutorial
6th	1ST	Problem solving
	2ND	Problem solving
	3RD	Problem solving
	4TH	Problem solving
	5th	Tutorial
		THE Z-TRANSFORM & ITS APPLICATION TO THE ANALYSIS OF LTI SYSTEM.
7th	1ST	Z-transform & its application to LTI system.
	2ND	Direct Z-transform.
	3RD	Inverse Z-transform
	4TH	Various properties of Z-transform.
	5th	Tutorial
8th	1ST	Rational Z-transform. Poles & zeros.
	2ND	Pole location time domain behaviour for casual signals
	3RD	System function of a linear time invariant system
	4TH	Discuss inverse Z-transform. Inverse Z-transform by partial fraction expansion
	5th	Tutorial
9th	1ST	Inverse Z-transform by contour Integration
	2ND	Inverse Z-transform by contour Integration
	3RD	Problem solving
	4TH	Problem solving
	5th	Tutorial
		DISCUSS FOURIER TRANSFORM: ITS APPLICATIONS PROPERTIES
10th	1ST	Concept of discrete Fourier transform
	2ND	Frequency domain sampling and reconstruction of discrete time signals.
	3RD	Frequency domain sampling and reconstruction of discrete time signals.
	4TH	Discrete Time Fourier transformation(DTFT)
	5th	Tutorial
11th	1ST	Discrete Fourier transformation (DFT).
	2ND	Compute DFT as a linear transformation.
	3RD	Relate DFT to other transforms
	4TH	Property of the DFT
	5th	Tutorial
12th	1ST	Multiplication of two DFT & circular convolution

	2ND	Multiplication of two DFT & circular convolution
	3RD	Problem solving
	4TH	Problem solving
	5th	Tutorial
		FAST FOURIER TRANSFORM ALGORITHM & DIGITAL FILTERS
13th	1ST	Compute DFT & FFT algorithm..
	2ND	Direct computation of DFT
	3RD	Direct computation of DFT
	4TH	Divide and Conquer Approach to computation of DFT
	5th	Tutorial
14th	1ST	Radix-2 algorithm. (Small Problems)
	2ND	Application of FFT algorithms
	3RD	Introduction to digital filters.(FIR Filters)& General considerations
	4TH	Introduction to DSP architecture, familiarisation of different types of processor
	5th	Tutorial
15th	1st	Introduction to DSP architecture, familiarization of different types of processor
	2nd	Problem solving
	3rd	Problem solving
	4th	Problem Solving
	5th	Tutorial

Lecturer(S-II) 22.12.25

H.O.D 22.12.25
Electrical&Electronics Engg.

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