GANDHI SCHOOL OF ENGINEERING

BHABANDHA, BERHAMPUR

BRANCH:- ELECTRONICS & TELECOMMUNICATION ENGINEERING

SEMESTER:- 6TH

SUBJECT:- DIGITAL SIGNAL PROCESSING

Name of the Faculty- ER SANTOSH KUMAR BISOYEE

	Topic to be taken				Actual topic taken			
Sl. No	Topic/Module	No. of period	Details of the topics	Date	Topic No.	Topic Name	Date	Remarks
1	Introduction of Signals, Systems & Signal processing	10	1.1 Basics of Signals, Systems & Signal processing- basic element of a digital signal processing system -Compare the advantages of digital signal processing over analog signal processing. 1.2 Classify signals - Multi channel& Multi-dimensional signals-Continuous time verses Discrete -times Signal. -Continuous valued verses Discrete -valued signals. 1.3 Concept of frequency in continuous time & discrete time signals-Continuous-time sinusoidal signals-Discrete-time sinusoidal signals-Harmonically related complex exponential. 1.4 Analog to Digital & Digital to Analog conversion & explain the following. a. Sampling of Analog signal, b. The sampling theorem. c. Quantization of continuous amplitude signals, d. Coding of quantized sample. e. Digital to analog conversion. f. Analysis of digital systems signals vs. discrete time signals systems.	18/01/2024 TO 06/02/2024	1.1 1.2 1.3	Basics of Signals, Systems & Signal processing- basic element of a digital signal processing system - Compare the advantages of digital signal processing over analog signal processing. Classify signals - Multi channel& Multi-dimensional signals-Continuous time verses Discrete -times Signal. -Continuous valued verses Discrete -valued signals. Concept of frequency in continuous time & discrete time signals-Continuous-time sinusoidal signals-Discrete-time sinusoidal signals-Harmonically related complex exponential.	18/01/2024 & 19/01/2024 20/01/2024 & 24/01/2024 25/01/2024 & 31/01/2024	

					1.4	Analog to Digital & Digital to Analog conversion & explain the following. a. Sampling of Analog signal, b. The sampling theorem. c. Quantization of continuous amplitude signals, d. Coding of quantized sample. e. Digital to analog conversion. f. Analysis of digital systems signals vs. discrete time signals systems.	01/02/2024 & 02/02/2024 & 03/02/2024 & 06/02/2024	
2	DISCRETE TIME SIGNALS & SYSTEMS	14	2.1 Concept of Discrete time signals. 2.1.1 Elementary Discrete time signals. 2.1.2 Classification Discrete time signal. 2.1.3 Simple manipulation of discrete time signal. 2.2 Discrete time system. 2.2.1 Input-output of system. 2.2.2 Block diagram of discrete- time systems 2.2.3 Classify discrete time system. 2.2.4 Inter connection of discrete -time system. 2.3 Discrete time time-invariant system. 2.3.1 Different techniques for the Analysis of linear system. 2.3.2 Resolution of a discrete time signal in to impulse. 2.3.3 Response of LTI system to arbitrary inputs using convolution sum. 2.3.4 Convolution & interconnection of LTI system - properties. 2.3.5 Study systems with finite duration and infinite duration impulse response. 2.4 Discrete time system described by difference equation. 2.4.1 Recursive & non-recursive discrete time system. 2.4.2 Determine the impulse response of linear time invariant recursive system.	07/02/2024 TO 27/02/2024	2.1 2.1.1 2.1.2 2.1.3 2.2 2.2.1 2.2.2 2.2.3 2.2.4 2.3 2.3.1 2.3.2 2.3.3 2.3.4 2.3.5	Concept of Discrete time signals. Elementary Discrete time signals. Classification Discrete time signal. Simple manipulation of discrete time signal. Discrete time system. Input-output of system. Block diagram of discrete- time systems Classify discrete time system. Inter connection of discrete -time system. Discrete time time-invariant system. Different techniques for the Analysis of linear system. Resolution of a discrete time signal in to impulse. 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.	07/02/2024 & 08/02/2024 & 09/02/2024 10/02/2024 & 13/02/2024 & 15/02/2024 16/02/2024 & 17/02/2024 & 20/02/2024 & 21/02/2024 & 22/02/2024	

			2.4.3 Correlation of Discrete Time signals		2.4 2.4.1 2.4.2 2.4.3	Discrete time system described by difference equation. Recursive & non-recursive discrete time system. Determine the impulse response of linear time invariant recursive system. Correlation of Discrete Time signals	23/02/2024 & 24/02/2024 & 27/02/2024	
3	THE Z-TRANSFORM & ITS APPLICATION TO THE ANALYSIS OF LTI SYSTEM.	14	3.1 Z-transform & its application to LTI system. 3.1.1 Direct Z-transform. 3.1.2 Inverse Z-transform. 3.2 Various properties of Z-transform. 3.3 Rational Z-transform. 3.3.1 Poles & zeros. 3.3.2 Pole location time domain behavior for casual signals. 3.3.3 System functions of a linear time invariant system.	28/02/2024 TO 21/03/2024	3.1 3.1.1 3.1.2 3.2 3.3 3.3.1 3.3.2 3.3.3	Z-transform & its application to LTI system. 3.1.1 Direct Z-transform. 3.1.2 Inverse Z-transform. Various properties of Z-transform. Rational Z-transform. Poles & zeros. Pole location time domain behavior for casual signals. System functions of a linear time invariant system.	28/02/2024 & 29/02/2024 & 01/03/2024 & 02/03/2024 & 06/03/2024 & 07/03/2024 & 12/03/2024 & 13/03/2024 & 14/03/2024 & 15/03/2024 & 16/03/2024 & 19/03/2024 & 20/03/2024 & 21/03/2024	

4	DISCUSS FOURIER TRANSFORM: ITS APPLICATIONS PROPERTIES.	12	4.1 Concept of discrete Fourier transform. 4.2 Frequency domain sampling and reconstruction of discrete time signals. 4.3 Discrete Time Fourier transformation(DTFT) 4.4 Discrete Fourier transformation (DFT). 4.5 Compute DFT as a linear transformation. 4.6 Relate DFT to other transforms. 4.7 Property of the DFT. 4.8 Multiplication of two DFT & circular convolution	22/03/2024 TO 10/04/2024	4.1	Concept of discrete Fourier transform.	22/03/2024	
					4.2	Frequency domain sampling and reconstruction of discrete time signals.	23/03/2024	
					4.3	Discrete Time Fourier transformation(DTFT)	27/03/2024 & 28/03/2024	
					4.4	Discrete Fourier transformation (DFT).	30/03/2024 & 02/04/2024	
					4.5	Compute DFT as a linear transformation.	03/04/2024 & 04/04/2024	
					4.6	Relate DFT to other transforms.	05/04/2024	
					4.7	Property of the DFT.	06/04/2024	
					4.8	Multiplication of two DFT & circular convolution	09/04/2024 & 10/04/2024	

`5	FAST FOURIER TRANSFORM ALGORITHM & DIGITAL FILTERS	10	5.1 Compute DFT & FFT algorithm. 5.2 Direct computation of DFT. 5.3 Divide and Conquer Approach to computation of DFT 5.4 Radix-2 algorithm. (Small Problems) 5.5 Application of FFT algorithms 5.6 Introduction to digital filters.(FIR Filters)& General considerations 5.7 Introduction to DSP architecture, familiarisation of different types of processor	12/04/2024 TO 26/04/2024	5.1	Compute DFT & FFT algorithm.	12/04/2024 & 13/04/2024	
					5.2	Direct computation of DFT.	16/04/2024 & 18/04/2024	
					5.3	Divide and Conquer Approach to computation of DFT	19/04/2024	
					5.4	Radix-2 algorithm. (Small Problems)	20/04/2024 & 23/04/2024	
					5.5	Application of FFT algorithms	24/04/2024	
					5.6	Introduction to digital filters.(FIR Filters)& General considerations	25/04/2024	
					5.7	Introduction to DSP architecture, familiarisation of different types of processor	26/04/2024	

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