LESSON PLAN (SUMMER-2023)

Discipline: ETC	**Semester:6th**	**Name of the Teaching Faculty: SOMA DASH**
Subject: Digital Signal Processing	**No of Days /per week class allotted: 4**	**Semester From date: 14.02.2023 To date: 23.05.2023** **No of Weeks:14**
Week	**Class Day**	**Theory / Practical Topics**
1st	1st	**1. Introduction of Signals, Systems & Signal processing(10)** 1.1 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	1.2 Classify signals - Multi channel& Multi-dimensional signals-Continuous time verses Discrete -times Signal. -
	4th	Continuous valued verses Discrete -valued signals.
2nd	1st	1.3 Concept of frequency in continuous time & discrete time signals-Continuous-time sinusoidal signals-Discrete-time sinusoidal signals-Harmonically related complex exponential.
	2nd	1.4 Analog to Digital & Digital to Analog conversion & explain the following. a. Sampling of Analog signal,
	3rd	b. The sampling theorem.
	4th	c. Quantization of continuous amplitude signals, d. Coding of quantized sample.
3rd	1st	e. Digital to analog conversion.
	2nd	f. Analysis of digital systems signals vs. discrete time signals systems.
	3rd	**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.
	4th	2.1.3 Simple manipulation of discrete time signal.
4th	1st	2.2 Discrete time system. 2.2.1 Input-output of system.
	2nd	2.2.2 Block diagram of discrete- time systems
	3rd	2.2.3 Classify discrete time system.
	4th	2.2.4 Inter connection of discrete -time system.
5th	1st	2.3 Discrete time time-invariant system. 2.3.1 Different techniques for the Analysis of linear system.
	2nd	2.3.2 Resolution of a discrete time signal in to impulse.
	3rd	2.3.3 Response of LTI system to arbitrary inputs using convolution sum.
	4th	2.3.4 Convolution & interconnection of LTI system - properties.
6th	1st	2.3.5 Study systems with finite duration and infinite duration impulse response.
	2nd	2.4 Discrete time system described by difference equation. 2.4.1 Recursive & non-recursive discrete time system.
	3rd	2.4.2 Determine the impulse response of linear time invariant recursive system.
	4th	2.4.3 Correlation of Discrete Time signals

7th	1st	**3. THE Z-TRANSFORM & ITS APPLICATION TO THE ANALYSIS OF LTI SYSTEM. (14)** 3.1 Z-transform & its application to LTI system.
	2nd	3.1.1 Direct Z-transform.
	3rd	3.1.2 Inverse Z-transform.
	4th	3.2 Various properties of Z-transform.
8th	1st	Continue
	2nd	3.3 Rational Z-transform.
	3rd	3.3.1 Poles & zeros.
	4th	3.3.2 Pole location time domain behaviour for casual signals.
9th	1st	3.3.3 System function of a linear time invariant system.
	2nd	3.4 Discuss inverse Z-transform.
	3rd	3.4.1 Inverse Z-transform by partial fraction expansion.
	4th	Continue
10th	1st	3.4.2 Inverse Z-transform by contour Integration
	2nd	Continue
	3rd	**4. DISCUSS FOURIER TRANSFORM: ITS APPLICATIONS PROPERTIES(12)** 4.1 Concept of discrete Fourier transform.
	4th	4.2 Frequency domain sampling and
11th	1st	reconstruction of discrete time signals.
	2nd	4.3 Discrete Time Fourier transformation(DTFT)
	3rd	Continue
	4th	4.4 Discrete Fourier transformation (DFT).
12th	1st	Continue
	2nd	4.5 Compute DFT as a linear transformation.
	3rd	4.6 Relate DFT to other transforms.
	4th	4.7 Property of the DFT.
13th	1st	4.8 Multiplication of two DFT &
	2nd	circular convolution
	3rd	**5. FAST FOURIER TRANSFORM ALGORITHM & DIGITAL FILTERS(10)** 5.1 Compute DFT & FFT algorithm.
	4th	Continue
14th	1st	5.2 Direct computation of DFT.
	2nd	5.3 Divide and Conquer Approach to computation of DFT
	3rd	5.4 Radix-2 algorithm. (Small Problems)
	4th	5.5 Application of FFT algorithms
15th	1st	5.6 Introduction to digital filters.
	2nd	(FIR Filters)& General considerations
	3rd	5.7 Introduction to DSP architecture,
	4th	familiarisation of different types of processor

Signature of the Faculty