

**LESSON PLAN (SUMMER-2022)**

<b>Discipline: ETC</b>	<b>Semester:6th</b>	<b>Name of the Teaching Faculty: Soma Dash</b>
<b>Subject: Digital Signal Processing</b>	<b>No of Days /per week class allotted: 4</b>	<b>Semester From date: 10.03.2022 To date: 10.06.2022 No of Weeks:13</b>
<b>Week</b>	<b>Class Day</b>	<b>Theory / Practical Topics</b>
<b>1st</b>	12-Mar	<b>1. Introduction of Signals, Systems &amp; Signal processing(10)</b> 1.1 Basics of Signals, Systems & Signal processing- basic element of a digital signal processing system -
	14-Mar	Compare the advantages of digital signal processing over analog signal processing.
	15-Mar	1.2 Classify signals - Multi channel& Multi-dimensional signals-Continuous time verses Discrete -times Signal. -
	16-Mar	Continuous valued verses Discrete -valued signals.
<b>2nd</b>	19-Mar	1.3 Concept of frequency in continuous time & discrete time signals-Continuous-time sinusoidal signals-Discrete-time sinusoidal signals-Harmonically related complex exponential.
	21-Mar	1.4 Analog to Digital & Digital to Analog conversion & explain the following. a. Sampling of Analog signal,
	22-Mar	b. The sampling theorem.
	23-Mar	c. Quantization of continuous amplitude signals, d. Coding of quantized sample.
<b>3rd</b>	26-Mar	e. Digital to analog conversion.
	28-Mar	f. Analysis of digital systems signals vs. discrete time signals systems.
	29-Mar	<b>2. DISCRETE TIME SIGNALS &amp; SYSTEMS (14)</b> <span style="float:right">2.1</span> Concept of Discrete time signals. 2.1.1 Elementary Discrete time signals. 2.1.2 Classification Discrete time signal.
	30-Mar	2.1.3 Simple manipulation of discrete time signal.
<b>4th</b>	02-Apr	2.2 Discrete time system. 2.2.1 Input-output of system.
	04-Apr	2.2.2 Block diagram of discrete- time systems
	05-Apr	2.2.3 Classify discrete time system.
	06-Apr	2.2.4 Inter connection of discrete -time system.
<b>5th</b>	09-Apr	2.3 Discrete time time-invariant system. 2.3.1 Different techniques for the Analysis of linear system.
	11-Apr	2.3.2 Resolution of a discrete time signal in to impulse.
	12-Apr	2.3.3 Response of LTI system to arbitrary inputs using convolution sum.
	13-Apr	2.3.4 Convolution & interconnection of LTI system - properties.
<b>6th</b>	16-Apr	2.3.5 Study systems with finite duration and infinite duration impulse response.
	18-Apr	2.4 Discrete time system described by difference equation. 2.4.1 Recursive & non-recursive discrete time system.
	19-Apr	2.4.2 Determine the impulse response of linear time invariant recursive system.
	20-Apr	2.4.3 Correlation of Discrete Time signals

7th	23-Apr	<b>3. THE Z-TRANSFORM &amp; ITS APPLICATION TO THE ANALYSIS OF LTI SYSTEM. (14)</b>
	25-Apr	3.1 Z-transform & its application to LTI system.
	26-Apr	3.1.1 Direct Z-transform.
	27-Apr	3.1.2 Inverse Z-transform.
8th	30-Apr	3.2 Various properties of Z-transform.
	02-May	Continue
	03-May	3.3 Rational Z-transform.
	04-May	3.3.1 Poles & zeros.
9th	07-May	3.3.2 Pole location time domain behaviour for casual signals.
	09-May	3.3.3 System function of a linear time invariant system.
	10-May	3.4 Discuss inverse Z-transform.
	11-May	3.4.1 Inverse Z-transform by partial fraction expansion.
10th	14-May	Continue
	16-May	3.4.2 Inverse Z-transform by contour Integration
	17-May	<b>4. DISCUSS FOURIER TRANSFORM: ITS APPLICATIONS PROPERTIES(12)</b>
	18-May	4.1 Concept of discrete Fourier transform.
11th	21-May	4.2 Frequency domain sampling and reconstruction of discrete time signals.
	23-May	4.3 Discrete Time Fourier transformation(DTFT)
	24-May	Continue
	25-May	4.4 Discrete Fourier transformation (DFT).
12th	28-May	4.5 Compute DFT as a linear transformation.
	30-May	Continue
	31-May	4.6 Relate DFT to other transforms.
	01-Jun	4.7 Property of the DFT.
13th	04-Jun	4.8 Multiplication of two DFT & circular convolution
	06-Jun	5. FAST FOURIER TRANSFORM ALGORITHM & DIGITAL FILTERS(10)
	07-Jun	5.1 Compute DFT & FFT algorithm.
	08-Jun	Continue
14th	Extra class	5.2 Direct computation of DFT.
	Extra class	5.3 Divide and Conquer Approach to computation of DFT
	Extra class	5.4 Radix-2 algorithm. (Small Problems)
	Extra class	5.5 Application of FFT algorithms
15th	Extra class	5.6 Introduction to digital filters.
	Extra class	(FIR Filters)& General considerations
	Extra class	5.7 Introduction to DSP architecture,
	Extra class	familiarisation of different types of processor