NILASAILA INSTITUTE OF SCIENCE & TECHNOLOGY SERGARH-756060, BALASORE (ODISHA)
(Approved by AICTE & affiliated to SCTE & VT, Odisha)

LESSON PLAN

SUBJECT:Th.3 (DIGITAL SIGNAL PROCESSING)

Name of the Faculty- Er.RAKESH KUMAR SETHI

Branch- Electrical & Electronics Engineering **Session**- 2024-25

Semester- 6th **Examination**- 2025(S)

CHAPTER WISE DISTRIBUTION OF PERIODS

Sl.No.	Name of the chapter as per the Syllabus	No. of Periods as per the Syllabus	No. of periods actually needed
1	INTRODUCTION OF SIGNAL,SYSTEMS & SIGNAL PROCESSING	10	10
2	DISCRETE TIME SIGNALS & SYSTEMS	14	14
3	THE Z-TRANSFORM & ITS APPLICATION TO THE ANALYSIS OF	14	14
4	DISCUSS FOURIER TRANSFORM: ITS APPLICATIONS PROPERTIES	12	12
5	FAST FOURIER TRANSFORM ALGORITHM & DIGITAL FILTERS	10	10
	TOTAL	60	60

SIGN OF FACULTY

SIGN HOD

Discipline: ELECTRICAL& ELECTRONICS ENGG.	Semester: 5TH	Name of the Teaching Faculty: Er. RAKESH KUMAR SETHI
		SESSION : 2024-25 **EXAMINATION :** 2024 (W)
Week	**Class Day**	**Theory / Practical Topics**
1st	1st	Introduction of Signals, Systems & Signal processing 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.
	2nd	Introduction of Signals, Systems & Signal processing 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.
	3rd	1.2 Classify signals - Multi channel& Multi-dimensional signals-Continuous time verses Discrete -times Signal. -Continuous valued verses Discrete -valued signals.
	4th	1.2 Classify signals - Multi channel& Multi-dimensional signals-Continuous time verses Discrete -times Signal. -Continuous valued verses Discrete -valued signals.
	5th	TUTORIAL
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	1.3 Concept of frequency in continuous time & discrete time signals-Continuous-time sinusoidal signals-Discrete-time sinusoidal signals-Harmonically related complex exponential.
	3rd	1.3 Concept of frequency in continuous time & discrete time signals-Continuous-time sinusoidal signals-Discrete-time sinusoidal signals-Harmonically related complex exponential.
	4th	1.4 Analog to Digital & Digital to Analog conversion & explain the following. a. Sampling of Analog signal,
	5th	TUTORIAL

Week	Class Day	Theory / Practical Topics
3rd	1st	b. The sampling theorem. c. Quantization of continuous amplitude signals,
	2nd	d. Coding of quantized sample. e. Digital to analog conversion. f. Analysis of digital systems signals vs. discrete time signals systems.
	3rd	Concept of Discrete time signals. Elementary Discrete time signals.
	4th	Concept of Discrete time signals. Elementary Discrete time signals.
	5th	TUTORIAL
4th	1st	Classification Discrete time signal. Simple manipulation of discrete time signal.
	2nd	Discrete time system. Input-output of system.
	3rd	2.2.2 Block diagram of discrete- time systems
	4th	Classify discrete time system. Inter connection of discrete -time system.
	5th	TUTORIAL
5th	1st	Discrete time time-invariant system. Different techniques for the Analysis of linear system.
	2nd	Resolution of a discrete time signal in to impulse. Response of LTI system to arbitrary inputs using convolution sum.
	3rd	2.3.4 Convolution & interconnection of LTI system - properties.
	4th	2.3.5 Study systems with finite duration and infinite duration impulse response.
	5th	TUTORIAL

Week	Class Day	Theory / Practical Topics
6th	1st	Discrete time system described by difference equation. Recursive & non-recursive discrete time system.
	2nd	2.4.2 Determine the impulse response of linear time invariant recursive system.
	3rd	2.4.2 Determine the impulse response of linear time invariant recursive system.
	4th	2.4.3 Correlation of Discrete Time signals
	5th	TUTORIAL
7th	1st	3 THE Z-TRANSFORM & ITS APPLICATION TO THE ANALYSIS OF LTI SYSTEM. 3.1 Z-transform & its application to LTI system.
	2nd	3 THE Z-TRANSFORM & ITS APPLICATION TO THE ANALYSIS OF LTI SYSTEM. 3.1 Z-transform & its application to LTI system.
	3rd	3.1.1 Direct Z-transform.
	4th	3.1.2 Inverse Z-transform.
	5th	TUTORIAL
8th	1st	3.2 Various properties of Z-transform.
	2nd	3.3 Rational Z-transform.
	3rd	3.3.1 Poles & zeros
	4th	3.3.2 Pole location time domain behaviour for casual signals.
	5th	TUTORIAL

Week	Class Day	Theory / Practical Topics
	1st	3.3.3 System function of a linear time invariant system.
9th	2nd	Discuss inverse Z-transform. Inverse Z-transform by partial fraction expansion
	3rd	Discuss inverse Z-transform. Inverse Z-transform by partial fraction expansion
	4th	**TUTORIAL**
10th	1st	3.4.2 Inverse Z-transform by contour Integration
	2nd	3.4.2 Inverse Z-transform by contour Integration
	3rd	4: DISCUSS FOURIER TRANSFORM: ITS APPLICATIONS PROPERTIES. 4.1 Concept of discrete Fourier transform.
	4th	4.2 Frequency domain sampling and reconstruction of discrete time signals.
	5th	TUTORIAL
11th	1st	4.2 Frequency domain sampling and reconstruction of discrete time signals.
	2nd	4.3 Discrete Time Fourier transformation(DTFT)
	3rd	4.3 Discrete Time Fourier transformation(DTFT)
	4th	4.4 Discrete Fourier transformation (DFT).

	5th	TUTORIAL
	Class Day	**Theory / Practical Topics**
12th	1st	4.5 Compute DFT as a linear transformation.
	2nd	4.5 Compute DFT as a linear transformation.
	3rd	4.6 Relate DFT to other transforms.
	4th	4.6 Relate DFT to other transforms.
	5th	TUTORIAL
13th	1st	4.7 Property of the DFT.
	2nd	4.8 Multiplication of two DFT & circular convolution
	3rd	5 FAST FOURIER TRANSFORM ALGORITHM & DIGITAL FILTERS. 5.1 Compute DFT & FFT algorithm.
	4th	5.2 Direct computation of DFT.
	5th	TUTORIAL
14th	1st	5.3 Divide and Conquer Approach to computation of DFT
	2nd	5.4 Radix-2 algorithm. (Small Problems)
	3rd	5.5 Application of FFT algorithms
	4th	5.5 Application of FFT algorithms
	5th	TUTORIAL

Week	Class Day	Theory / Practical Topics
15th	1st	5.6 Introduction to digital filters.(FIR Filters)& General considerations
	2nd	5.7 Introduction to DSP architecture, familiarisation of different types of processor
	3rd	5.7 Introduction to DSP architecture, familiarisation of different types of processor
	4th	TUTORIAL

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