PNS SCHOOL OF ENGG. & TECH., MARSHAGHAI
DEPARTMENT OF ELECTRONICS & TELECOMMUNICATION ENGINEERING

LESSON PLAN

BRANCH : ETC. ENGINEERING	SEMESTER : 6TH	NAME OF TEACHING FACULTY : **ER. ADITYA NARAYAN JENA**
SUBJECT : DIGITAL SIGNAL PROCESSING	NO. OF DAYS/ PER WEEK CLASS ALLOTTED : 05	SEMESTER FROM DATE : 04.02.2025 TO 17.05.2025 NO. OF WEEKS : 15
WEEK	**CLASSDAY**	**THEORY TOPICS**
1ST	1st	**1.INTRODUCTION OF SIGNAL, SYSTEM & SIGNAL PROCESSING** Discuss Signal, System,Signal Processing Explain basic element of a digital signal processing system. Compare the advantages of digital signal processing over analog signal processing.
	2nd	Classify Signals Multichannel & Multi dimensional signals. Continuous time verses Discrete -times Signal. Continuous valued verses Discrete- valued signals**.**
	3rd	Discuss the concept of frequency in continuous time & discrete time signals Continuous-time sinusoidal signals. Discrete-time sinusoidal signals. Harmonically related complex exponential.
	4th	Discuss Analog to Digital & Digital to Analog conversion. Sampling of Analog signal. Problems on Nyquist rate.
	5th	Revision
2ND	1st	Quantization of continuous amplitude signals. Coding of quantized sample.
	2nd	Digital to analog conversion. Analysis of digital systems signals vs. discrete time signals systems.
	3rd	**2.DISCRETE TIME SIGNALS & SYSTEMS.** State and explain discrete time signals. Discuss some elementary discrete time signals. Classify discrete time signal.

	4th	Discuss simple manipulation of discrete time signal.
	5th	Revision
3RD	1st	Problems related to the manipulation of signals.
	2nd	Discuss discrete time system. Describe input- output of system. Draw block diagram of discrete- time systems & related problems.
	3rd	Classify discrete time system.
	4th	Classify Discrete time systems and problems.
	5th	Revision
4TH	1st	Problems related to Discrete time systems.
	2nd	Discuss inter connection of discrete- time system.
	3rd	Discuss discrete time- invariant system. Discuss different technique for the analysis of linear system.
	4th	Discuss the resolution of a discrete time signal into impulse.
	5th	Revision
5TH	1st	Discuss the response of LTI system to arbitrary I/Ps using nvolution th theorem.
	2nd	Problems on convolution theorem.
	3rd	Explain the properties of Convolution & interconnection of LTI stem.
	4th	Study systems with duration and infinite duration impulse response
	5th	Revision
6TH	1st	Problems on FIR and IIR.
	2nd	Discuss discrete time system described by difference equation.
	3rd	Determine the impulse response of linier time invariant recursive system.
	4th	**3. THE Z- TRANSFORM & ITS APPLICATION TO THE ANALYSIS OF LTI SYSTEM.** Discuss z transform & its application to LTI system. State & explain direct z-transform. Problems on Direct Z transform.
	5th	Revision
7TH	1st	Discuss various properties of Z-transform.
	2nd	Properties of Z transform.
	3rd	Problems on Z transform.
	4th	Problems on Z transform.
	5th	Revision

8TH	1st	<u>Discuss rational Z-transform.</u> Explain poles & zeros. Determine pole location time domain behaviour for casual signals.
	2nd	Describe the system function of a linear time invariant system
	3rd	State & explain inverse Z-transform.
	4th	Inverse Z- transform by partial fraction
	5th	Revision
9TH	1st	Problems on inverse Z-transform.
	2nd	Problems on Inverse Z-transform.
	3rd	Class test.
	4th	**4. DISCUSS FOURIER TRANSFORM: ITS APPLICATION PROPERTIES.** Discuss discrete Fourier transform. Determine frequency domain sampling and reconstruction of discrete time signals.
	5th	Revision
10TH	1st	State & explain discrete Time Fourier transformation(DTFT) State & explain discrete Fourier transformation (DFT).
	2nd	Problems on DFT .
	3rd	Computer DFT as a linear transformation .
	4th	Problem using Twiddle factor.
	5th	Revision
11TH	1st	Relate DFT to other transforms
	2nd	Discuss the property of the DFT.
	3rd	Explain multiplication of two DFT & circular convolution.
	4th	Problems related to circular convolution.
	5th	Revision
12TH	1st	Previous Year questions on DFT.
	2nd	**5. FAST FOURIER TRANSFORM ALGORITHM & DIGITAL FILTERS.** Computer DFT & FFT algorithm
	3rd	Explain direct computation of DFT.
	4th	Radix 2 DIT Algorithm
	5th	Revision
13TH	1st	Problems on DIT.
	2nd	Radix 2 DIF Algorithm.
	3rd	Problems on DIF.
	4th	Introduction to digital filters. (FIR Filters)
	5th	Revision