

GOVERNMENT POLYTECHNIC, SAMBALPUR, RENGALI

DEPARTMENT OF E&TC ENGINEERING

LESSON PLAN(SUMMER-2023)

SUBJECT- DIGITAL SIGNAL PROCESSING(TH-3)

SEMESTER-6TH

NAME OF THE FACULTY- Ms. SADHANA SUBHALAXMI

TOTAL NO. OF PERIODS-60(4P/WEEK)

UNIT	DATE	PERIOD	TOPICS TO BE COVERED
1	1st week of February 2023		Introduction of Signals, Systems & Signal processing
		1	Basics of Signals, Systems & Signal processing- basic element of a digital signal processing system
		2	Compare the advantages of digital signal processing over analog signal processing.
		3	Classify signals - Multi channel & Multi-dimensional signals Continuous time versus Discrete -time Signal. -Continuous valued versus Discrete -valued signals
		4	Concept of frequency in continuous time & discrete time signals Continuous-time sinusoidal signals-Discrete-time sinusoidal signals- Harmonically related complex exponential
		5	Analog to Digital & Digital to Analog conversion & explain the following. a. Sampling of Analog signal,
		6	b. The sampling theorem.
		7	c. Quantization of continuous amplitude signals,
		8	d. Coding of quantized sample. e. Digital to analog conversion.
		9	f. Analysis of digital systems signals vs. discrete time signals systems
		10	Previous year questions, numericals & assignment discussion.
			DISCRETE TIME SIGNALS & SYSTEMS.
		1	Concept of Discrete time signals. -> Elementary Discrete time signals.
		2	-> Classification Discrete time signal
		3	-> Simple manipulation of discrete time signal.
		4	Discrete time system. -> Input-output of system. -> Block diagram of discrete- time systems
		5	->Classify discrete time system

2	1 st week of March, 2023	6	->Inter connection of discrete -time system.
		7	Discrete time time-invariant system. -> Different techniques for the Analysis of linear system.
		8	->Resolution of a discrete time signal in to impulse. ->Response of LTI system to arbitrary inputs using convolution sum.
		9	->Convolution & interconnection of LTI system - properties.
		10	->Study systems with finite duration and infinite duration impulse response.
		11	Discrete time system described by difference equation. ----->Recursive & non-recursive discrete time system
		12	->Determine the impulse response of linear time invariant recursive system.
		13	->Correlation of Discrete Time signals
		14	Previous year questions, numericals & assignment discussion
		3	1st week of April, 2023
1	Z-transform & its application to LTI system.		
2	Direct Z-transform.		
3	Inverse Z-transform		
4	Various properties of Z-transform.		
5			
6	Rational Z-transform.		
7	Poles & zeros.		
8	Pole location time domain behaviour for casual signals.		
9	System function of a linear time invariant system.		
10	Discuss inverse Z-transform.		
11	Inverse Z-transform by partial fraction expansion.		
12	Inverse Z-transform by contour Integration		
13	Previous year questions, numericals & assignment discussion		
14	Revision Test		
			DISCUSS FOURIER TRANSFORM: ITS APPLICATIONS PROPERTIES.
		1	Concept of discrete Fourier transform.
		2	Frequency domain sampling and reconstruction of discrete time signals.
		3	

4	4th week of April,2023	4	Discrete Time Fourier transformation (DTFT)
		5	Discrete Fourier transformation (DFT).
		6	
		7	Compute DFT as a linear transformation.
		8	Relate DFT to other transforms.
		9	Property of the DFT.
		10	Multiplication of two DFT & circular convolution
		11	
		12	Previous year questions, numericals & assignment discussion
5	3rd week of May,2023		FAST FOURIER TRANSFORM ALGORITHM & DIGITAL FILTERS.
		1	Compute DFT & FFT algorithm
		2	
		3	Direct computation of DFT.
		4	Divide and Conquer Approach to computation of DFT
		5	Radix-2 algorithm. (Small Problems)
		6	Application of FFT algorithms
		7	5.6 Introduction to digital filters.(FIR Filters)& General considerations
		8	Introduction to DSP architecture, familiarisation of different types of processor
		9	
10	Previous year questions, numericals & assignment discussion		