ACADEMIC LESSION PLAN FOR SUMMER - 2023

Dept. of Electronics & Telecommunication, Govt. Polytechnic , Balasore

Name of the Faculty: Yogasakti Yogamaya (Lecturer, E&TC)

Digital Signal Processing (TH-3)

Theory : 4 P/W
Total Period s : 60 P/ Sem
Examination : 3 Hours
Sem : 5 E&TC

Internal Assessment : 20 Marks
End Semester Exam : 80marks
TOTAL MARKS : 100 Marks
Start of Class : 14 February2023

WEEK	PERIOD	TOPIC
1st	1st	**Introduction of Signals, Systems & Signal processing** 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	Classify signals - Multi channel& Multi-dimensional signals-Continuous time verses Discrete -times Signal. – Continuous valued verses Discrete -valued signals.
	3rd	Concept of frequency in continuous time & discrete time signals-Continuous-time sinusoidal signals-
	4th	Discrete-time sinusoidal signals-Harmonically related complex exponential.
2nd	1st	Analog to Digital & Digital to Analog conversion ,Sampling of Analog signal,
	2nd	The sampling theorem, Quantization of continuous amplitude signals
	3rd	Coding of quantized sample. Digital to analog conversion
	4th	Analysis of digital systems signals vs. discrete time signals systems
3rd	1st	**DISCRETE TIME SIGNALS & SYSTEMS.** Concept of Discrete time signals .Elementary Discrete time signals. Classification Discrete time signal.
	2nd	Classification Discrete time signal
	3rd	Simple manipulation of discrete time signal. Discrete time system. Input-output of system.
	4th	Block diagram of discrete- time systems .Classify discrete time system.
4th	1st	Classify discrete time system.
	2nd	Inter connection of discrete -time system
	3rd	Discrete time time-invariant system. Different techniques for the Analysis of linear system.
	4th	Resolution of a discrete time signal in to impulse. Response of LTI system to arbitrary inputs using convolution sum
5th	1st	Convolution & interconnection of LTI system - properties.
	2nd	5 Study systems with finite duration and infinite duration impulse response
	3rd	Recursive & non-recursive discrete time system.
	4th	Determine the impulse response of linear time invariant recursive system.

6th	1st	Correlation of Discrete Time signals
	2nd	**THE Z-TRANSFORM & ITS APPLICATION TO THE ANALYSIS OF LTI SYSTEM.:** Z-transform & its application to LTI system
	3rd	Direct Z-transform.
	4th	Inverse Z-transform.
7th	1st	Inverse Z-transform
	2nd	Various properties of Z-transform
	3rd	Various properties of Z-transform
	4th	Rational Z-transform. Poles & zeros
8th	1st	Pole location time domain behavior for casual signals
	2nd	System function of a linear time invariant system.
	3rd	Inverse Z-transform by partial fraction expansion
	4th	Inverse Z-transform by partial fraction expansion
9th	1st	Inverse Z-transform by contour Integration
	2nd	Inverse Z-transform by contour Integration
	3rd	**DISCUSS FOURIER TRANSFORM: ITS APPLICATIONS** PROPERTIES: Concept of discrete Fourier transform.
	4th	Frequency domain sampling and reconstruction of discrete time signals.
10th	1st	Discrete Time Fourier transformation(DTFT)
	2nd	Discrete Time Fourier transformation(DTFT)
	3rd	Discrete Fourier transformation (DFT).
	4th	Discrete Fourier transformation (DFT).
11th	1st	Compute DFT as a linear transformation
	2nd	Relate DFT to other transforms
	3rd	Property of the DFT
	4th	Property of the DFT
12th	1st	Multiplication of two DFT
	2nd	circular convolution
	3rd	circular convolution
	4th	**FAST FOURIER TRANSFORM ALGORITHM & DIGITAL FILTERS:** 5.1 Compute DFT & FFT algorithm.
13th	1st	Direct computation of DFT.
	2nd	Examples of DFT
	3rd	Divide and Conquer Approach to computation of DFT
	4th	Radix-2 algorithm
14th	1st	Radix-2 algorithm
	2nd	Radix-2 algorithm
	3rd	Radix-2 algorithm
	4th	Application of FFT algorithms
15th	1st	Introduction to digital filters.(FIR Filters)& General considerations
	2nd	FIR filter
	3rd	Introduction to DSP architecture
	4th	familiarization of different types of processor

13/2/23
(Left in Talk)