

Lesson Plan

Discipline: ETC		Semester-6th Summer-2025	Name of the Teaching Faculty: Asutosh Sahoo & Rabindra Kumar Satpathy (Lecture ETC Engg)
Sl. No.	Subject-Th-3 Digital Signal Processing	No. Of Days/Week class alloted:04	Semester From date: 4.02.2025 To date: 17.05.2025 No of weeks: 15
	Weeks/Months	Class Day	Topic
1	1st week of February	1st	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	1.2 Classify signals - Multi channel& Multi-dimensional signals- Continuous time verses Discrete -times Signal. - Continuous valued verses Discrete -valued signals
		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	a. Sampling of Analog signal, b. The sampling theorem
2	2nd week of February	1st	c. Quantization of continuous amplitude signals, d. Coding of quantized sample.
		2nd	e. Digital to analog conversion
		3rd	f. Analysis of digital systems signals vs. discrete time signals systems.
		4th	Concept of Discrete time signals. 2.1.1 Elementary Discrete time signals
3	3rd week of February	1st	2.1.2 Classification Discrete time signal
		2nd	2.2.3 Classify discrete time system
		3rd	2.2.4 Inter connection of discrete -time system
		4th	2.2.4 Inter connection of discrete -time system
4	4th week of February	1st	2.3.1 Different techniques for the Analysis of linear system.
5	1st week of March	1st	2.3.1 Different techniques for the Analysis of linear system.
		2nd	2.3.2 Resolution of a discrete time signal in to impulse.
		3rd	2.3.2 Resolution of a discrete time signal in to impulse.
		4th	2.3.3 Response of LTI system to arbitrary inputs using convolution sum
6	2nd week of March	1st	2.3.3 Response of LTI system to arbitrary inputs using convolution sum
		2nd	2.3.4 Convolution & interconnection of LTI system - properties.
		3rd	Convolution & interconnection of LTI system - properties.
		4th	2.3.5 Study systems with finite duration and infinite duration impulse response
7	3rd week of March	1st	Discrete time system described by difference equation. 2.4.1 Recursive & non-recursive discrete time system
		2nd	Discrete time system described by difference equation. 2.4.1 Recursive & non-recursive discrete time system

		3rd	2.4.2 Determine the impulse response of linear time invariant recursive system
		4th	2.4.3 Correlation of Discrete Time signals
8	4th week of March	1st	Z-TRANSFORM & ITS APPLICATION TO THE ANALYSIS OF LTI SYSTEM. 3.1 Z-transform & its application to LTI system
		2nd	3.1.1 Direct Z-transform
		3rd	3.4.2 Inverse Z-transform by contour Integration
		4th	3.1.1 Direct Z-transform
9	1st week of April	1st	3.2 Various properties of Z-transform
		2nd	3.3 Rational Z-transform.
		3rd	3.3.1 poles and zero
		4th	3.3.2 pole location
10	2nd week of April	1st	3.3.3 System function of a linear time invariant system
		2nd	3.4 Discuss inverse Z-transform. 3.4.1 Inverse Z-transform by partial fraction expansion
		3rd	3.4 Discuss inverse Z-transform. 3.4.1 Inverse Z-transform by partial fraction expansion
		4th	3.4.2 Inverse Z-transform by contour Integration
11	3rd Week of April	1st	: DISCUSS FOURIER TRANSFORM: ITS APPLICATIONS PROPERTIES. 4.1 Concept of discrete Fourier transform
		2nd	4.2 Frequency domain sampling and reconstruction of discrete time signals.
		3rd	4.3 DTFT
		3rd	4.4 Discrete Fourier transformation (DFT
		4th	4.5 Compute DFT as linear
12	4th week of April	1st	4.6 relate dft as other
		2nd	4.7 Property of the DFT.
		3rd	4.8 Multiplication of two DFT & circular convolution
		3rd	5.1 Compute DFT & FFT algorithm
		4th	5.1 Compute DFT & FFT algorithm
13	1st week of May	1st	5.1 Compute DFT & FFT algorithm
		2nd	5.2 Direct computation of DFT
		3rd	5.2 Direct computation of DFT
		4th	5.3 Divide and Conquer Approach to computation of DFT
14	2nd week of May	1st	5.3 Divide and Conquer Approach to computation of DFT
		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	5.4 Radix-2 algorithm
15	3rd week of May	1st	5.4 Radix-2 algorithm
		2nd	5.5 Application of FFT algorithms
		3rd	5.6 Introduction to digital filters.(FIR Filters)& General considerations

4th

5.7 Introduction to DSP architecture, familiarisation of different types of processor

Asutosh Sahoo
Signature of the Teacher