

AMRITA VISHWA VIDYAPEETHAM
LECTURE PLAN

Academic year: 2021 - 2022	Semester: Even
Department: ECE	Programme: B. Tech CSE (Cyber Security)
Course Code & Name: 20CYS111 DIGITAL SIGNAL PROCESSING	

Lecture No(s)	Topics	Key-words	Learning Objectives	Quiz / Assignment	CO	PO/PSO*
1	Introduction- Signal Processing	Elementary signals, operations on signals	Characterization of Elementary signals and signal operations	Quiz 1 (BTL 2) Assignment 1	CO1	PO1,PO2,PSO1
2-5	Basic signals: unit step, unit impulse, sinusoidal and complex exponential signals				CO1	PO1,PO2,PSO1
6- 8	Types of signals- Basic operations on signals				CO1	PO1,PO2,PSO1
9-11	System properties	LTI system	Analysis of LTI systems in continuous and discrete time domain	Quiz 2 (BTL 3) Assignment 2	CO1,CO3,CO4	PO1,PO2,PO3, PO12,PSO1,PS O2
12-13	Time Domain characterization of continuous time and discrete time LTI system				CO1,CO3,CO4	PO1,PO2,PO3, PO12,PSO1,PS O2
14-15	Convolution sum	Convolution	Analysis of signals in LTI systems		CO1,CO3,CO4	PO1,PO2,PO3, PO12,PSO1,PS O2
15	Analysis of LTI system described by differential and difference equations.	differential and difference equations.	Mathematical Representation of continuous and discrete time systems	Quiz 3 (BTL 4) Assignment 3	CO1,CO3,CO4	PO1,PO2,PO3, PO12,PSO1,PS O2
16-17	Introduction to Fourier series and Fourier transforms	Fourier transform	Spectral analysis of continuous and discrete time signals		CO2	PO1,PO2,PSO1
18-20	Fourier analysis of discrete time signals and systems: Discrete time Fourier series	Discrete time Fourier series	Spectral analysis of discrete time periodic signals and systems		CO2	PO1,PO2,PSO1
21-23	Discrete Time Fourier Transform- properties of DTFT	Discrete Time Fourier Transform	Spectral analysis of discrete time aperiodic signals		CO2	PO1,PO2,PSO1
24-27	Introduction to DFT- properties of DFT- linear filtering methods based on DFT	properties of DFT	Analysis of input, impulse response, output using DFT		CO2	PO1,PO2,PSO1
28-30	FFT algorithms	Fast Fourier Transform	Efficient implementation of DFT	Quiz 4 (BTL 3) Assignment 4	CO2	PO1,PO2,PSO1
31-32	Digital filters: Introduction, specifications of practical filters Characteristics of commonly used analog filters –	Digital filters	Characteristics of analog filter and digital filter		CO2,CO3,CO4	PO1,PO2, PO3,PO12,PSO 1,PSO2

33-36	IIR filters: design by approximation of derivatives – impulse invariance and bilinear transformation – Butterworth filter	IIR filters	Design of IIR filters	Quiz 5 (BTL 4) Assignment 5	CO3,CO4	PO1,PO2,PO3, PO4,PO12,PSO 1,PSO2
37-39	frequency transformations for analog and digital filters- Structures for IIR systems.	Structures for IIR systems.	frequency transformations for analog and digital filters		CO2,CO3,CO4	PO1,PO2,PO3, PO4,PO12,PSO 1,PSO2
40-44	FIR filters: symmetric and anti-symmetric FIR filters – design of linear phase FIR filter using windows – Structures for FIR systems – direct form	FIR filters	design of linear phase FIR filter using windows	Quiz 6 (BTL 4) Assignment 6	CO3,CO4	PO1,PO2,PO3, PO4,PO12,PSO 1,PSO2
45	Brief introduction to Wavelets and Wavelet transform.	Wavelets	Insight into wavelets		CO3,CO4	PO1,PO2,PO3, PO4,PO12,PSO 1,PSO2

Course Outcomes

CO1: To understand the concepts of signals and systems.

CO2: To analyze the frequency domain characteristics of discrete time signals and systems

CO3: To comprehend realization structures for filters.

CO4: To develop a digital signal processing system for different applications.

CO – PO Mapping

CO/ PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	-	-	-	-	-	-	-	-	-	2	2	-
CO2	3	2	3	-	-	-	-	-	-	-	-	2	2	-
CO3	3	2	-	2	-	-	-	-	-	-	-	2	2	-
CO4	3	2	3	2	-	-	-	-	-	-	-	2	2	2

Evaluation Pattern

Type	Evaluation Component	Count	Relevant COs	Weightage
Mid Term Exam	Online Exam	1	CO1,CO2,CO3,CO4	10
	Viva	1		20
Continuous Assessment	Tutorial	10	CO1,CO2,CO3,CO4	5
	Assignment	6	CO1,CO2,CO3,CO4	5
	Online Quiz	6	CO1,CO2,CO3,CO4	10
End Semester	Online Exam	1	CO1,CO2,CO3,CO4	20
	Viva	1		30
Total				100