PANIPAT INSTITUTE OF ENGINEERING & TECHNOLOGY
Department of Electronics & Communication Engineering

LESSON PLAN

Subject Name: - Digital Signal Processing **Subject Code: - EC-309A**
Year: - 3rd **Semester: - 5th**

Lecture No	Unit No.	Topic	COs Covered
L 1	1	**Discrete Transforms**: Z- transform and ROC properties,	CO1
L 2		Z- transform and its properties,	
L 3		Z- transform and its properties,	
L 4		Inversion of Z-transform	
L 5		Inversion of Z-transform	
L 6		One sided Z- transform and solution of differential equations	
L 7		One sided Z- transform and solution of differential equations	
L 8		Analysis of LTI systems in Z-domain, causality, stability,	
L 9		Schur-cohn stability test, Relationship between Z-transform and Fourier transform	
L 10		**Frequency Selective Filters**: All pass filters, minimum-phase, Maximum-phase and mixed- phase systems,	
L 11		Goertzel algorithm	
L 12		Chirp Z-transform, applications of Z-Transform	
L 13	2	**Frequency Domain Sampling and DFT**: DTFT, DFT, properties	CO2
L 14		Linear filtering using DFT, Frequency analysis of signals using DFT	
L 15		radix 2 FFT	
L16		radix-4 FFT, computation of DFT of real sequences	
L17		**Implementation Structures of Discrete Time Systems**. and.	CO3
L 18		Direct form, cascade form for FIR systems	
L 19		frequency sampling and lattice structures for FIR systems	
L 20		Direct forms, transposed form, cascade form for IIR systems	
L 21		parallel form, Lattice for IIR systems	

L 22		lattice ladder structures for IIR systems	
L 23	3	**Design of IIR Filters:** Design of IIR filters from analog filters, Design by approximation of derivatives	
L 24		Impulse Invariance Method, Bilinear Transformation Method	
L 25		Characteristics and design of Butterworth analog filters	
L 26		Characteristics and design of Chebyshev analog filters	
L 27		Characteristics and design of Elliptical analog filters	
L 28		Frequency transformations, design of IIR filters in frequency domain.	
L 29		Least Square Methods	
L 30	4	**Design of FIR Filters:** Characteristics of practical frequency selective filters, types of FIR filters, filter design specifications such as peak pass band ripple, minimum stop band attenuation etc.,	CO4
L 31		alternation theorem	
L 32		Design of FIR filters using windowing method	
L 33		Design of FIR filters using windowing method	
L 34		frequency sampling method	
L 35		Park-McClellan's method	
L 36		Design of optimum equiripple FIR filters	
L37		Comparison of design methods for FIR filters	
L38		Effect of finite register length in FIR filter design	

Text/Reference Books:

1. J. G. Proakis and D.G. Manolakis, “Digital Signal Processing: Principles, Algorithms And Applications”, 4th ed. Prentice Hall.
2. A.V. Oppenheim and R. W. Schafer, “Discrete Time Signal Processing”, Prentice Hall, 1989.
3. S. K. Mitra, “Digital Signal Processing: A computer based approach”, McGraw Hill, 2011.
4. L. R. Rabiner and B. Gold, “Theory and Application of Digital Signal Processing”, Prentice Hall, 1992.
5. J. R. Johnson, “Introduction to Digital Signal Processing”, Prentice Hall, 1992.
6. D. J. DeFatta, J. G. Lucas andW. S. Hodgkiss, “Digital Signal Processing”, John Wiley & Sons, 1988

Web resources:

https://nptel.ac.in/courses/117102060