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	References
1	1	**Discrete Transforms:** Z- transform and its properties,	J. G. Proakis and D.G. Manolakis
2	1	Inversion of Z-transform,	J. G. Proakis and D.G. Manolakis
3	1	One sided Z- transform and solution of differential equations.	J. G. Proakis and D.G. Manolakis
4	1	Analysis of LTI systems in Z-domain:	J. G. Proakis and D.G. Manolakis
5	1	Causality and Stability	J. G. Proakis and D.G. Manolakis
6	1	Schur-Cohn stability test, Relationship between Z-transform and Fourier transform.	J. G. Proakis and D.G. Manolakis
7	1	Frequency Selective Filters: All pass filters	J. G. Proakis and D.G. Manolakis
8	1	Minimum-phase, maximum-phase and mixed- phase systems,	J. G. Proakis and D.G. Manolakis
9	1	Goertzel algorithm	J. G. Proakis and D.G. Manolakis
10	1	Chirp Z-transform	J. G. Proakis and D.G. Manolakis
11	1	Applications of Z-Transform	J. G. Proakis and D.G.

			Manolakis
12	2	**Frequency Domain Sampling and DFT**: DTFT	J. G. Proakis and D.G. Manolakis
13	2	DFT and DFT properties	J. G. Proakis and D.G. Manolakis
14	2	Linear filtering using DFT,	J. G. Proakis and D.G. Manolakis
15	2	Frequency analysis of signals using DFT	J. G. Proakis and D.G. Manolakis
16	2	Radix 2 and Radix-4 FFT	J. G. Proakis and D.G. Manolakis
17	2	Computation of DFT of real sequences.	J. G. Proakis and D.G. Manolakis
18	2	**Implementation Structures of Discrete Time Systems FIR**: Direct form, cascade form	J. G. Proakis and D.G. Manolakis
19	2	Frequency sampling and lattice structures	J. G. Proakis and D.G. Manolakis
20	2	**Implementation Structures of Discrete Time Systems IIR** : Direct forms I and II	J. G. Proakis and D.G. Manolakis
21	2	Transposed form, Cascade form	J. G. Proakis and D.G. Manolakis
22	2	Parallel form	J. G. Proakis and D.G. Manolakis
23	2	Lattice and lattice ladder structures	J. G. Proakis and D.G. Manolakis
24	3	**Unit 3: Design of FIR Filters**: Characteristics of practical frequency selective filters	S. Salivahanan, Gnanapriya, "Digital Signal Processing
25	3	Types of FIR filters	S. Salivahanan, Gnanapriya, "Digital Signal Processing

26	3	Filter design specifications such as peak pass band ripple, minimum stop band attenuation etc.	S. Salivahanan, Gnanapriya, "Digital Signal Processing
27	3	Alternation theorem	S. Salivahanan, Gnanapriya, "Digital Signal Processing
28	3	Design of FIR filters using windowing method I	S. Salivahanan, Gnanapriya, "Digital Signal Processing
29	3	Design of FIR filters using windowing method II	S. Salivahanan, Gnanapriya, "Digital Signal Processing
30	3	Frequency sampling method	S. Salivahanan, Gnanapriya, "Digital Signal Processing
31	3	Park-McClellan's method.	Internet
32	3	Design of optimum equiripple FIR filters	S. Salivahanan, Gnanapriya, "Digital Signal Processing
33	3	Comparison of design methods for FIR filters.	S. Salivahanan, Gnanapriya, "Digital Signal Processing
34	3	Effect of finite register length in FIR filter design.	S. Salivahanan, Gnanapriya, "Digital Signal Processing
35	4	**Design of IIR Filters**: Design of IIR filters from analog filters,	S. Salivahanan, Gnanapriya, "Digital Signal Processing
36	4	Design by approximation of derivatives,	S. Salivahanan, Gnanapriya, "Digital Signal Processing
37	4	Impulse Invariance Method	S. Salivahanan, Gnanapriya, "Digital Signal Processing

38	4	Bilinear Transformation Method,	S. Salivahanan, Gnanapriya, "Digital Signal Processing
39	4	Least Square Methods.	J. G. Proakis and D.G. Manolakis
40	4	Characteristics of Butterworth analog filters	J. G. Proakis and D.G. Manolakis
41	4	Characteristics of Chebyshev analog filters	J. G. Proakis and D.G. Manolakis
42	4	Characteristics of Elliptical analog filters	J. G. Proakis and D.G. Manolakis
43	4	Frequency transformations	J. G. Proakis and D.G. Manolakis
44	4	Design of IIR filters in frequency domain.	J. G. Proakis and D.G. Manolakis
45	1	Revision Unit 1	
46	1	Revision Unit 1	
47	2	Revision Unit 2	
48	2	Revision Unit 2	
49	3	Revision Unit 3	
50	4	Revision Unit 4	

Text 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. S. Salivahanan, Gnanapriya, "Digital Signal Processing", Mc Graw Hill, 2nd Edition

Reference Books:
1. L. R. Rabiner and B. Gold, "Theory and Application of Digital Signal Processing", Prentice Hall, 1992.
2. J. R. Johnson, "Introduction to Digital Signal Processing", Prentice Hall, 1992.
3. D. J. DeFatta, J. G. Lucas and W. S. Hodgkiss, "Digital Signal Processing", John Wiley & Sons, 1988.