

Lecture Number	Topics to be covered	Date (s)
<b>UNIT – I: Signal analysis and Fourier series</b>		
1	Introduction to Signals and Systems	13 June 2016
2	Analogy between vectors and signals, Orthogonal Signal Space, Signal approximation using Orthogonal functions	14 June 2016
3	Mean square error, Closed or complete set of orthogonal functions ,problems	15 June 2016
4	Orthogonality and complex functions, problems	18 June 2016
5	Tutorial (G1,G2,G3) - Problems related to classification of signals	15,17,18 June 2016
6	Exponential and sinusoidal signals,	20 June 2016
7	Concepts of Impulse, Unit step and Signum functions	21 June 2016
8	Fourier series representation and CT Periodic signals	22 June 2016
9	Properties of Fourier series	25 June 2016
10	Tutorial (G1,G2,G3) - Problems related to Fourier series	22, 24 ,25 June 2016
11	Dirichlet's conditions and Trigonometric Fourier series	27 June 2016
12	Exponential Fourier series	28 June 2016
13	Exponential Fourier series	29 June 2016
14	Complex Fourier spectrum	2 July 2016
<b>UNIT-II: Fourier transforms and sampling</b>		
15	Tutorial (G1,G2,G3) - Problems related to Exponential Fourier series	29 June 1,2 July 2016
16	Deriving Fourier Transform from Fourier Series, FT of an arbitrary signal	4 July 2016
17	Fourier Transform of Standard signals	5 July 2016
18	Properties of Fourier Transform	9 July 2016
19	Properties of Fourier Transform	11 July 2016
20	Tutorial (G1,G2,G3)- Problems related to Fourier Transform	8,9 July 2016
21	FT of impulse and signum functions and Hilbert Transform	12 July 2016
22	Sampling theorem- Graphical and analytical proof for band limited signals	13 July 2016
23	Types of sampling- impulse , natural and flat top	16 July 2016
24	Reconstruction of signal from its samples	18 July 2016
25	Tutorial (G1,G2,G3)- Problems related to sampling	13,15,16 July 2016
26	Effect of under sampling- aliasing	19 July 2016
27	Introduction to Bandpass sampling	20 July 2016
<b>UNIT-III: : Signal Transmission Through Linear Systems</b>		
28	Linear system, Impulse Response, Response of a linear system, LTI system, LTV system	23 July 2016
29	Transfer function of a LTI system, Filter characteristics of linear systems	25 July 2016
30	Tutorial (G1,G2,G3)- Problems related to LTI systems	20,22,23 July 2016
31	Distortion less transmission through a systems	26 July 2016
32	Signal and System band width, Ideal LPF, HPF and BPF characteristics	27 July 2016

33	Causality and Paley -wiener criterion for physical realization	30 July 2016
34	Relationship between Bandwidth and Rise times	2 August 2016
35	Tutorial (G1,G2,G3)- Problems related to Bandwidth and rise time	27,29,30 July 2016
<b>UNIT-IV: Convolution And Correlation Of Signals</b>		
36	Concept of convolution in Time domain and Frequency domain, Graphical representation of convolution	3 August 2016
37	Convolution property of FT, Cross and Auto correlation of functions,	6 August 2016
38	Properties of correlation function ,Energy density spectrum,	16 August 2016
39	Parseval's theorem, Power spectrum density	17 August 2016
40	Tutorial (G1,G2,G3) - Problems related to Convolution	3, 5,6 August 2016
41	Relation between Auto correlation and Energy/Power density spectrum	20 August 2016
42	Relation between Auto correlation and Energy/Power density spectrum	22 August 2016
43	Detection of periodic signals in the presence of noise by correlation	23 August 2016
44	Extraction of signal from noise by filtering	24 August 2016
45	Tutorial (G1,G2,G3)- Problems related to Energy/Power density spectrum	17,19,20 August 2016
<b>UNIT-V: Laplace Transforms And Z- Transforms</b>		
46	Review of LT, Inverse L.T and Partial fraction expansion	27 August 2016
47	Concept of Region of Convergence (ROC) for laplace transforms	29 August 2016
48	Constraints on Region of Convergence(ROC) for various classes of signals	30 August 2016
49	Constraints on Region of Convergence(ROC) for various classes of signals	31 August 2016
50	Properties of Laplace Transforms,	3 September 2016
51	Tutorial(G1,G2,G3):Problems on Laplace Transforms	24,26,27 August 2016
52	Relation between L.T and F.T of a signal	6 September 2016
53	L.T of certain signals using wave form synthesis	7 September 2016
54	Problems on Region of Convergence(ROC)	10 September 2016
55	Problems on Inverse L.T	13 September 2016
56	Tutorial (G1,G2,G3):Problems on Inverse L.T, Partial fraction expansion,ROC.	31 August 2016, 2,3 September 2016
57	Partial fraction expansion	14 September 2016
58	<b>Z-Transforms:</b> Fundamental difference between continuous and Discrete Time signals	17 September 2016
59	Discrete time signals representation using complex exponential and sinusoidal signals	19 September 2016
60	Periodicity of DT signal using complex exponential signal	20 September 2016
61	Tutorial(G1,G2,G3):Problems on Z-transforms	7,9,10 September 2016
62	Problems on Z-transforms	21 September 2016
63	Concept of z – transform of a Discrete sequence	24 September 2016
64	Distinction between Laplace, Fourier and Z-transforms	26 September 2016

65	ROC in Z-Transforms	27 September 2016
66	Tutorial(G1,G2,G3):Problems on ROC in Z-transforms	14,16 ,17 September 2016
67	Constraints on ROC for various classes of signals	28 September 2016
68	Constraints on ROC for various classes of signals	1 October 2016
69	Properties of Z- Transforms	3 October 2016
70	Properties of Z- Transforms	4 October 2016
71	Tutorial(G1,G2,G3):Problems on ROC in Z-transforms	21,23,24 September 2016
72	Inverse Z-Transforms	29 October 2016
73	Inverse Z-Transforms	31 October 2016
74	Problems on Inverse Z-transforms	1 October 2016
75	Problems on Inverse Z-transforms	2 October 2016
76	Tutorial(G2,G3,G1):Problems on ROC	28 ,29 October, 2 November 2016

#### TEXT BOOKS:

1. B.P Lathi," Signals, Systems & Communications" - B.P. Lathi, BS Publications, 2003.
2. A.V. Oppenheim, A.S. Willsky and S.H. Nawab, "Signals and Systems", PHI, 2nd Edn.
3. Simon Haykin and Van Veen,Wiley," Signals & Systems" - 2nd Edition.

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