

Bhoj Reddy Engineering College for Women: Hyderabad  
Department of Electronics and Communication Engineering  
Lesson plan of faculty member for the academic year 2016–17

Class: II B Tech

Branch-Section: ECE-A

Semester: I

Subject: Signals and Systems

Lectures per week: 4+1 (Tutorial)

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

<b>UNIT-IV: Convolution And Correlation Of Signals</b>		
35	Concept of convolution in Time domain and Frequency domain,	3 August 2016
36	Graphical representation of convolution, Convolution property of FT, Cross and Auto correlation of functions,	5 August 2016
37	Properties of correlation function ,Energy density spectrum,	6 August 2016
38	Tutorial(G3,G1,G2):Problems on correlation	3, 4, 5 August 2016
39	Parseval's theorem	17 August 2016
40	Power spectrum density	19 August 2016
41	Relation between Auto correlation and Energy/Power density spectrum	20 August 2016
42	Tutorial(G3,G1,G2):Problems on Energy/Power density spectrum	17, 18, 19 August 2016
43	Detection of periodic signals in the presence of noise by correlation	22 August 2016
44	Extraction of signal from noise by filtering	24 August 2016
<b>UNIT-V: Laplace Transforms And Z- Transforms</b>		
45	Review of LT, Inverse L.T	26 August 2016
46	Partial fraction expansion	27 August 2016
47	Tutorial(G3,G2):Problems on Laplace Transforms	24, 26 August 2016
48	Concept of Region of Convergence (ROC) for laplace transforms	29 August 2016
49	Constraints on Region of Convergence(ROC) for various classes of signals	31 August 2016
50	Properties of LT	2 September 2016
51	Relation between L.T and F.T of a signal	3 September 2016
52	L.T of certain signals using wave form synthesis	31 August, 1, 2 September 2016
53	Problems on Region of Convergence(ROC)	7 September 2016
54	Problems on Inverse L.T, Partial fraction expansion, ROC.	9 September 2016
55	<b>Z-Transforms:</b> Fundamental difference between continuous and Discrete Time signals	10 September 2016
56	Tutorial (G3, G1, G2): Partial fraction expansion,ROC.	7, 8, 9 September 2016
57	Discrete time signals representation using complex exponential signals	14 September 2016
58	Discrete time signals representation using sinusoidal signals	16 September 2016
59	Periodicity of DT signal using complex exponential signal	17 September 2016
60	Concept of z – transform of a Discrete sequence	14, 15, 16 September 2016
61	Tutorial(G3,G1,G2):Problems on Z-transforms	19 September 2016
62	Distinction between Laplace, Fourier and Z-transforms	21 September 2016
63	ROC in Z-Transforms	23 September 2016
64	Constraints on ROC for various classes of signals	24 September 2016
65	Tutorial(G3,G1,G2):Problems on ROC in Z-transforms	21, 22, 23 September 2016
66	Inverse Z - Transform	26 September 2016
67	Properties of Z- Transforms	28 September 2016
68	Problems on Inverse Z-transforms	1 October 2016
69	Properties of Z- Transforms	28, 29 September 2016
70	Tutorial(G3,G1,G2):Problems on ROC in Z-transforms	3 October 2016
71	Problems on Inverse Z-transforms	28 October 2016
72	Revision	29 October 2016
73	Tutorial(G3,G1):Revision	27, 28 October 2016
74	Discussion of Previous Papers	31 October 2016
75	Discussion of Previous Papers	2 November 2016
76	Tutorial(G1,G2):Revision	2,3 November 2016

#### **TEXT BOOKS:**

1. Signals, Systems & Communications - B.P. Lathi, BS Publications, 2003.
2. Signals and Systems - A.V. Oppenheim, A.S. Willsky and S.H. Nawab, PHI, 2nd Edn.

**REFERENCE BOOKS:**

1. Signals & Systems - Simon Haykin and Van Veen,Wiley, 2nd Edition.
2. Signals and systems – Iyer and K.Satya Prasad, Cengage learning
3. Signals and systems- A.Rama Krishna Rao – 2008 TMH
4. Introduction to Signals and systems - K.Gopalan 2009, cengage learning.

Name and signature of the faculty: Prof Yedukondalu K ----

Name and signature of Head of the Department: Ms N Shribala ----