

**Department of Electronics and Communication Engineering**

**Bhoj Reddy Engineering College for Women: Hyderabad**

Lesson Plan of faculty member for the academic year 2015– 2016

Name of the faculty member : Radhika Rayeekanti

ECE Dept.

Subject: **Signals And Systems**

Class: **II B. Tech.**

Branch & Section: **ECE-A**

Semester: **I**

No. of lectures per week: 4+1 (Tutorial)

Lecture Number	Date(s)	Topics to be covered
<b>UNIT-I: SIGNAL ANALYSIS AND FOURIER SERIES</b>		
1.	2/7/15	Introduction to Signals and Systems
2.	3/7/15	Concepts of Impulse, Unit step and Signum functions
3.	2/7/15, ----, 4/7/15	Tutorial (G1, G3): Problems on standard test signals
4.	6/7/15	Classification of signals: Energy, Power, Even and Odd , periodic and Aperiodic signals
5.	7/7/15	Real and Complex exponential, sinusoidal signals, Classification of Systems
6.	9/7/15	Analogy between vectors and signals, Signal approximation using Orthogonal Signal Space
7.	10/7/15	Mean square error, problems
8.	6/7/15,9/7/15,11/7/15	Tutorial(G1,G2,G3): Problems on classification of signals
9.	13/7/15	Closed or complete set of orthogonal functions
10.	14/7/15	Orthogonality and complex functions, problems
11.	16/7/15	Fourier series representation and CT Periodic signals
12.	17/7/15	Dirichlet's conditions and Trigonometric fourier series
13.	13/7/15, --,18/7/15,	Tutorial (G1,G3): Related problems
14.	20/7/15	Exponential Fourier series and Properties
15.	21/7/15	Complex Fourier spectrum
<b>UNIT-II: FOURIER TRANSFORMS AND SAMPLING</b>		
16.	23/7/15	Deriving Fourier Transform from Fourier Series, FT of an arbitrary signal
17.	24/7/15	Fourier Transform of Standard signals
18.	20/7/15,23/7/15,25/7/15	Tutorial(G1,G2,G3): Problems on Fourier Series
19.	27/7/15	Fourier Transform of Periodic signals, Properties of Fourier Transform
20.	28/7/15	Properties of Fourier Transform
21.	30/7/15	FT of impulse and signum functions , and Hilbert Transform
22.	31/7/15	Sampling theorem- Graphical and analytical proof for band limited signals
23.	27/7/15, 30/7/15,1/8/15	Tutorial (G1,G2,G3): problems on Fourier Transform
24.	3/8/15	Types of sampling- impulse , natural and flat top
25.	4/8/15	Reconstruction of signal from it's samples

26.	6/8/15	Effect of under sampling- aliasing
27.	7/8/15	Introduction to Bandpass sampling
28.	3/8/15,6/8/15,8/8/15	Tutorial(G2,G3,G1): Problems on sampling
<b>UNIT-III: SIGNAL TRANSMISSION THROUGH LTI SYSTEMS</b>		
29.	11/8/15	Linear system, Impulse Response, Response of a linear system, LTI system, LTV system
30.	13/8/15	Transfer function of a LTI system, Filter characteristics of linear systems
31.	14/8/15	Distortion less transmission through a systems
32.	10/8/15, 13/8/15,15/8/15	Tutorial (G2): Problems on LTI system properties
33.	17/8/15	Signal and System band width, Ideal LPF, HPF and BPF characteristics
34.	18/8/15	Causality and Paley -wiener criterion for physical realization
35.	20/8/15	Relation ship between bandwidth and rise times
36.	21/8/15	Problems on signal and system bandwidth
37.	17/8/15,20/8/15, 22/8/15	Tutorial (G1,G2,G3): Problems on LPF, HPF , BPF
<b>UNIT-IV: CONVOLUTION AND CORRELATION OF SIGNALS</b>		
38.	31/8/15	Convolution in time domain and Frequency domain, Graphical representation of convolution
39.	1/9/15	Convolution property of FT, Cross and Auto correlation of functions, properties of correlation function
40.	3/9/15	Energy density spectrum, Parseval's theorem, Power spectrum density
41.	4/9/15	Relation between Auto correlation and Energy/Power density spectrum
42.	31/8/15, 3/9/15, 5/9/15	Tutorial(G1,G2,G3): Problems on convolution and correlation
43.	7/9/15	Relation between convolution and correlation
44.	8/9/15	Detection of periodic signals in the presence of noise by correlation
45.	10/9/15	Extraction of signal from noise by filtering
46.	11/9/15	Related problems
47.	7/9/15, 10/9/15, 12/9/15	Tutorial(G1,G2,G3): Related problems
<b>UNIT-V: LAPLACE TRANSFORMS AND Z- TRANSFORMS</b>		
48.	14/9/15	Review of LT, Concept of ROC for laplace transforms
49.	15/9/15	Constraints on ROC for various classes of signals, Properties of LT
50.	18/9/15	Properties of LT, Relation between L.T and F.T of a signal
51.	14/9/15, --, 19/9/15	Tutorial (G1,G3); Problems on L.T
52.	21/9/15	L.T of certain signals using wave form synthesis
53.	22/9/15	Inverse L.T and Partial fraction expansion
54.	25/9/15	Problems on properties of L.T
55.	--,22/9/15,26/9/15	Tutorial (G2,G3): problems on Inverse L.T
56.	28/9/15	Fundamental difference between continuous and Discrete Timesignals,DTSrepresentation using complex exponential and sinusoidal signals

57.	29/9/15	Periodicity of DT signal using complex exponential signal, Concept of $z$ – transform of a Discrete sequence
58.	1/10/15	Distinction between Laplace, Fourier and $Z$ transforms
59.	28/9/15,1/10/15,3/10/15	Tutorial (G2,G3,G1): Problems on $Z$ - transforms
60.	5/10/15	ROC in $Z$ -Transforms, Constraints on ROC for various classes of signals
61.	6/10/15	Properties of $Z$ - Transform
62.	8/10/15	Inverse $Z$ - Transform
63.	9/10/15	Problems on Inverse $Z$ - transform
64.	5/10/15, 8/10/15, 10/10/15	Tutorial (G1,G2, G3): Problems on $Z.T$ and $I.Z.T$
65.	13/10/15	Revision
66.	14/10/15	Revision
67.	16/10/15	Revision
68.	12/10/15,15/10/15, 17/10/15	Tutorial (G2, G3): Revision

### 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.

**Signature of the faculty**

**Signature of the HOD**