

**Bhoj Reddy Engineering College for Women: Hyderabad**  
**Department of Electronics and Communication Engineering**

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

Name of the faculty member and Department: MS. S. Surekha, ECE

Subject: Digital Signal Processing

Class: III B. Tech

Branch & Section: ECE-A

Semester: II

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

Lecture Number	Date(s)	Topics to be covered
<b>UNIT-I: INTRODUCTION TO DIGITAL SIGNAL PROCESSING AND REALIZATION OF DIGITAL FILTERS</b>		
1.	7/12/15	Introduction to Digital Signal Processing
2.	9/12/15	DT signals and sequences, LTI system, Stability and causality
3.	11/12/15	Linear constant co-efficients difference equation
4.	12/12/15	Frequency domain representation of DT signals
5.	8/12/15, 10/12/15, 11/12/15	Tutorial (G3, G2, G1): Problem solving on LCCDE
6.	14/12/15	Applications of Z-Transform,
7.	16/12/15	Solution of difference equation of Digital filters
8.	18/12/15	System function, Stability Criteria, Frequency response of stable systems
9.	19/12/15	Realization of Digital filters using Direct, Canonic forms
10.	15/12/15, 17/12/15, 18/12/15	Tutorial (G3, G2, G1): Problem solving on IFFT
11.	21/12/15	Realization of Digital filters using cascade & parallel forms
12.	23/12/15	Problems on Z-Transforms
13.	22/12/15, -----, -----	Tutorial (G3): Related problems
<b>UNIT –II : DISCRETE FOURIER SERIES AND FAST FOURIER TRANSFORMS</b>		
14.	28/12/15	DFS representation of periodic sequences, Properties of Discrete Fourier series
15.	30/12/15	Discrete Fourier transform, Properties of Discrete Fourier transform
16.	1/1/16	linear convolution using Discrete Fourier transform
17.	2/1/16	Computation of Discrete Fourier transform: Over-lap Add method, Over-lap Save method, Problems
18.	29/12/15, 31/12/15, 1/1/16	Tutorial (G3, G2, G1): Problem solving on DFS, DFT
19.	4/1/16	Relation between DTFT, DFS, DFT and Z-Transform
20.	6/1/16	Fast Fourier transform, Radix-2 DIT Fast Fourier transform algorithm
21.	8/1/16	Radix-2 DIF Fast Fourier transform algorithm, Problems
22.	9/1/16	Inverse DFT with general radix

23.	5/1/16, 7/1/16, 8/1/16	Tutorial (G3,G2,G1): Problem solving on Fast Fourier Transforms
24.	11/1/16	Inverse FFT with general radix-N
<b>UNIT-III: IIR DIGITAL FILTERS</b>		
25.	13/1/16	Analog filter Approximations, Butterworth Approximations
26.	16/1/16	Analog filter Approximations: Chebyshev Approximations
27.	12/1/16, ----, -----	Tutorial(G3): Problem solving on Filter realization
28.	18/1/16	Problem solving on Butterworth and Chebyshev filters
29.	20/1/16	Design of Digital Butterworth filter
30.	22/1/16	Design of Digital Chebyshev filter, Problem
31.	23/1/16	Step and Impulse Invariance Transformation
32.	19/1/16, 21/1/16, 22/1/16	Tutorial (G3,G2,G1): Problem solving on IIR filters, Digital Butterworth filter
33.	25/1/16	Problems on Impulse Invariance Transformation
34.	27/1/16	Bilinear Transformation
35.	29/1/16	Spectral Transformation
36.	30/1/16	Problem solving on transformations
37.	-----, 28/1/16, 29/1/16	Tutorial (G2,G1): Problem solving on Chebyshev filter
38.	22/2/16	Problem solving on transformations
<b>UNIT-IV: IIR Digital Filters</b>		
39.	24/2/16	Characteristics of FIR Digital Filters
40.	26/2/16	Frequency response of Linear phase FIR filter
41.	27/2/16	Design of Linear phase FIR filter using Fourier Method
42.	23/2/16, 25/2/16, 26/2/16	Tutorial(G3,G2,G1): Problem solving on FIR filters
43.	29/2/16	Design of Linear phase FIR filter using frequency Sampling technique
44.	2/3/16	Design of Linear phase FIR filter using window technique
45.	4/3/16	Comparison of FIR and IIR Filters,
46.	5/3/16	Problems on FIR and IIR Filters
47.	1/3/16, 3/3/16, 4/3/16	Tutorial(G3,G2,G1): Problem solving on FIR filter design
48.	9/3/16	Problems on FIR and IIR Filters
<b>UNIT-V: MULTIRATE DIGITAL SIGNAL PROCESSING AND FINITE WORD LENGTH EFFECTS</b>		
49.	11/3/16	Introduction, Down sampling, Decimation
50.	12/3/16	Up sampling, Interpolation
51.	8/3/16, 10/3/16, 11/3/16	Tutorial (G3,G2,G1); Problem solving on MDSP
52.	14/3/16	Sampling Rate Conversion
53.	16/3/16	conversion of band pass signals, Concept of re-sampling
54.	18/3/16	Advantages of multi rate signal processing, Applications

55.	19/3/16	Problem solving on Sampling rate conversion
56.	15/3/16, 17/3/16, 18/3/16	Tutorial (G3,G2,G1): Problem solving on MDSP
57.	21/3/16	Limit cycles. Overflow oscillations
58.	26/3/16	Round-off noise in IIR digital filters, Computational output round off noise
59.	22/3/16, 24/3/16, -----	Tutorial (G3,G2): Problem solving on finite word length effects
60.	28/3/16	Methods to prevent overflow
61.	30/3/16	Trade off between round off and overflow noise
62.	1/4/16	Measurement of coefficient quantization effects through pole-zero movement
63.	2/4/16	Dead band effects
64.	29/3/16, 31/3/16, 1/4/16	Tutorial (G3,G2, G1): Problem solving on finite word length
65.	4/4/16	Revision
66.	6/4/16	Revision
67.	9/4/16	Revision
68.	-----, 7/4/16, -----	Tutorial (G2): Revision
69.	11/4/16	Previous Papers Revision
70.	13/4/16	Previous Papers Revision
71.	16/4/16	Previous Papers Revision
72.	11/4/16, ----, -----	Tutorial (G3):Previous Papers Revision

#### **TEXT BOOKS:**

1. Digital Signal Processing, Principles, Algorithms, and Applications: John G. Proakis, Dimitris G. Manolakis. Pearson Education / PHI. 2007.
2. Discrete Time Signal Processing-A. V. Oppenheim and R.W. Schaffer. PHI, 2009
3. Fundamentals of Digital Signal Processing - Loney Ludeman. John Wiley, 2009

#### **REFERENCE BOOKS:**

1. Digital Signal Processing - Fundamentals and Applications - Li Tan, Elsevier. 2008
2. Fundamentals of Digital Signal Processing using Matlab - Robert J. Schilling. Sandra L, Harris, Thomson. 2007
3. Digital Signal Processing - S.Salivahanan. A.Vallavaraj and Cgnanapriya.TMH.2009

**Name of the faculty: S.Surekha**

**Signature of the faculty:**

**Signature of the Head:**