MERI COLLEGE OF ENGINEERING AND TECHNOLOGY

Asanda, Near Sampla

(www.meri.edu.in/engineering/)

LESSON PLAN

Name of the faculty : Er. Gaurav Kumar

Discipline : EEE/ECE

Semester : 7th

Subject : DSP

Lesson Plan Duration : 15 weeks (From August, 2018 to November 2018)

Work Load (Lecture/ Practical) per week (in hours): Lecture-04, Practical-02

Week	Theory		Practical	
	Lecture day	Topic(Including assignment/test)	Practical Day	Topic
1st	1st	Digital Signal Processing – Introduction, Basic elements of digital signal Processing, Concept of frequency in continuous time signals	1st	To understand sampling theorem & generation of waveforms like sine, square & Triangle
	2nd	Digital Signal Processing – Introduction, Basic elements of digital signal Processing, Concept of frequency in continuous time signals		
	3rd	Concept of frequency in discrete time signals		
	4th	Sampling theorem		
2nd	1st	Sampling theorem	2nd	To develop program for discrete convolution
	2nd	Discrete time signals and Discrete time systems		
	3rd	Analysis of Linear time invariant systems: response of LTI systems to arbitrary inputs, convolution sum		
	4th	Analysis of Linear time invariant systems: response of LTI systems to arbitrary inputs, convolution		

		sum		
3rd	1st	properties of convolution & interconnection of systems	3rd	To develop program for discrete correlation.
	2nd	Correlation of discrete time signals, properties of cross correlation and auto correlation sequences		
	3rd	Correlation of discrete time signals, properties of cross correlation and auto correlation sequences		
	4th	The Z transform, convergence properties and inverse Z transform		
4th	1st	Properties of Z transform: linearity, time shifting, scaling, time reversal, differentiation in the Z domain	4th	To study Quantization technique
	2nd	Properties of Z transform: linearity, time shifting, scaling, time reversal, differentiation in the Z domain		
	3rd	Z transform properties : convolution of two sequences, correlation of two sequences, multiplication of two sequences,		
	4th	Parseval's relation, Initial value theorem		
5th	1st	Introduction to Discrete fourier transform -DFT	5th	To study PCM encoding & Hamming code generation
	2nd	Properties of DFT : Periodicity, linearity and symmetry, multiplication of two DFTs		
	3rd	Properties of DFT : Periodicity, linearity and symmetry, multiplication of two DFTs		
	4th	Properties of DFT : Circular Convolution time reversal, circular time shift, circular frequency shift, Parseval's theorem		
6th	1st	Efficient computation of DFT: Direct computation, Divide and conquer approach	6th	represent basic signals (Unit step, unit impulse, ramp, exponential, sine and cosine)
	2nd	Radix-2 FFT algorithms: Decimation in time (DIT)		
	3rd	Tutorial – Radix 2 FFT-Decimation in Time		
	4th	Radix-2 FFT algorithms:		

		Decimation in frequency (DIF)		
7th	1st	Tutorial – Radix 2 FFT- Decimation in frequency (DIF)	7th	To design analog filter(low-pass, high pass, band-pass, band-stop)
	2nd	Use of FFT algorithms in Linear Filtering DCT-Discrete Cosine Transform		
	3rd	Continuous Assessment Test – 1		
	4th	Structure of IIR- Direct form structures		
8th	1st	Structure of IIR- Direct form structures	8th	To design digital IIR filters(low-pass, high pass, band-pass, band-stop)
	2nd	Direct form structures :form I and II Realization		
	3rd	Cascade form structures,Parallel form structures		
	4th	Lattice and lattice ladder structures		
9th	1st	Tutorial on IIR structures	9th	To design digital IIR filters(low-pass, high pass, band-pass, band-stop)
	2nd	Analog filter Design		
	3rd	Design of IIR filters from continuous time filter		
	4th	Design of IIR filters from continuous time filter		
10th	1st	IIR filter design by Impulse Invariance	10th	To design FIR filters using windows technique.
	2nd	IIR filter design by Bilinear transformation		
	3rd	Tutorial on IIR filter design		
	4th	IIR filter design by Approximation of derivatives		
11th	1st	High Pass Filter, Band Pass Filter,	11th	To design FIR filters using windows technique.
	2nd	Band Reject Filter design using frequency translation		
	3rd	Band Reject Filter design using frequency translation		
	4th	Structures for FIR systems:Direct and Cascade form structures		
12th	1st	Frequency Sampling Structures, Lattice structures	12th	. To study Auto correlation & Linear convolution
	2nd	Tutorial on FIR structures		
	3rd	Linear phase FIR filter – Filter design using windowing techniques		
	4th	Filter Design using Rectangular		
13th	1st	Hamming and Hanning windows	13th	To study FIR Filter Implementation.
	2nd	Tutorial on design of FIR filter using Rectangular ,Hamming and Hanning windows		

	3rd	Tutorial on design of FIR filter using Rectangular ,Hamming and Hanning windows		
	4th	Filter Design using Bartlett and Kaiser windows		
14th	1st	Tutorial on design of FIR filter using Bartlett and Kaiser windows	14th	To study FIR Filter Implementation.
	2nd	Design of linear phase FIR filters by Frequency Sampling Techniques		
	3rd	Tutorial on Frequency Sampling Techniques		
	4th	Finite word length effects in digital Filters : Quantization noise, comparison between over flow , truncation and co-efficient quantization error		
15th	1st	Discussion on previous year question papers	15th	To Study Digital modulation techniques ASK/FSK& PSK .
	2nd	Discussion on previous year question papers		
	3rd	Discussion on previous year question papers		
	4th	Discussion on previous year question papers		

BOOKS REFERRED:

TEXT BOOK:

1. John G. Proakis & Dimitris G.Manolakis, "Digital Signal Processing – Principles, Algorithms & Applications", Fourth edition, Pearson education / Prentice Hall, 2007.
2. Emmanuel C..Ifeachor, & Barrie.W.Jervis, "Digital Signal Processing", Second edition, Pearson Education / Prentice Hall, 2002.

REFERENCES:

1. Alan V.Oppenheim, Ronald W. Schafer & Hohn. R.Back, "Discrete Time Signal Processing", Pearson Education, 2nd edition, 2005.
2. Andreas Antoniou, "Digital Signal Processing", Tata McGraw Hill, 2001