PES INSTITUTE OF TECHNOLOGY BANGALORE SOUTH CAMPUS
Hosur Road,
ELECTRONIC CITY, BANGALORE

LESSON - PLAN

DIGITAL SIGNAL PROCESSING

Subject Code : 17EC52 **IA Marks : 40**
Hours/Week : 04 **Exam. Hours : 03**
Total Hours : 50 **Exam. Marks : 60**
Faculty: Ms. B SIREESHA

Module	TOPICS	%Portion Coverage	
		Reference	Cumulative
Module 1		20%	20%
	Introduction to DSP, Discrete Fourier Transform (DFT)		
	Frequency domain sampling		
	Reconstruction of discrete time signals		
	DFT as a linear transformation		
	Problems		
	Relationship of DFT with other transforms		
	PROPERTIES OF DFT		
	Multiplication of two DFT's – Circular Convolution		
	Problems on circular convolution		
	Additional DFT properties		
	Problems on additional DFT properties		
Module 2	Use of DFT in linear filtering	20%	40%
	Overlap and Save method for the computation of DFT		
	Overlap and Add method for the computation of DFT		
	Problems		
	Direct Computation of DFT		
	Need for efficient computation of the DFT (FFT algorithms)		
Module 3	Radix 2 FFT algorithm for the computation of DFT,IDFT – Decimation in time algorithm	20%	60%
	Radix 2 FFT algorithm for the computation of DFT,IDFT – Decimation in frequency algorithm		
	Problems on DITFFT algorithm		

	Problems on DIFFFT algorithm		
	Georgtzel algorithm		
	Chirp-z transform		

Module 4	Structures for IIR systems Direct Form, Cascade form, Parallel form structures	**20%**	**80%**
	Characteristics of commonly used analog Butterworth filters,Chebyshev filters		
	Problems on analog Butterworth and Chebyshev filters		
	Analog to Analog frequency transformations		
	Problems on Analog to Analog frequency transformations		
	Design of IIR filters from analog filters (Butterworth) – Impulse Invariance method		
	Bilinear Transformation method		
Module 5	Structures for FIR systems Direct Form, Cascade form, Lattice structure.	**20%**	**100%**
	FIR filter design using frequency sampling technique		
	Problems on FIR filter design		
	FIR FILTER DESIGN		
	Introduction to FIR filters		
	Design of FIR filters using – Rectangular window		
	- Hamming window		
	- Hanning window		
	- Bartlett window		

TEXT BOOKS

1. Digital Signal Processing - Principles, Algorithms & Applications, Proakis & Monalakis, Pearson Education, 4th Edition, New Delhi, 2007.

REFERENCE BOOKS

1. **Discrete Time Signal Processing,** Oppenheim & Schaffer, PHI, 2003.
2. **Digital Signal Processing,** S K Mitra Tata Mc Graw Hill, 3rd Edition, 2010.
3. **Digital Signal Processing,** Lee Tan, Elsevier Publications, 2007.