Lesson Plan

Faculty : Narayanan Kallingal

CLASS	BE Electronics, Semester VII		
Academic Term	**July – November 2019**		
Subject : **ELX 703**	**Digital Signal Processing**		
Periods (Hours) per week	***Lecture***	*4*	
	Practical	*--*	
	Tutorial	*--*	
Evaluation System		***Hours***	***Marks***
	Theory examination	3	80
	Internal Assessment	--	20
	Practical Examination	--	--
	Oral Examination	--	--
	Term work	--	--
	Total	--	100

Time Table	***Day***	***Time***
	Tuesday	3.30 – 4.30
	Wednesday	9.45 – 10.45
	Thursday	9.45 – 10.45
	Friday	2.30 – 3.30

Course Content and Lesson plan

Module 1: **Discrete Fourier Transform and Fast Fourier Transform**

	Lecture No.	Date Planned	Date Actual	Topic	Remarks (If any)
	1	02 – 07 – 19	03 – 07 – 19	Introduction, COs, Review of SS	Special TT
	2	03 – 07 – 19	04 – 07 – 19	Circular convolution	01 – 07 – 19
	3	04 – 07 – 19	05 – 07 – 19	DFT, Numerical, Properties	to
	4	05 – 07 – 19	10 – 07 – 19	DFT Properties, Numerical	12 – 07 – 19
	5	10 – 07 – 19	11 – 07 – 19	Relationship between ZT and DFT	
	6	11 – 07 – 19	12– 07 – 19	Overlap save and Overlap Add	

	7	12 – 07 – 19		FFT radix 2 DIT	
	8	16 – 07 – 19		FFT radix 2 DIF	
	9	17 – 07 – 19		Composite FFT	Assignment 1
Module 2: **IIR Digital Filters**					
	10	23 – 07 – 19		Types of filters	
	11	24 – 07 – 19		Analog filter approximations. Butterworth	
	12	25 – 07 – 19		Chebyshev	
	13	26 – 07 – 19		Mapping of s plane to z plane	
	14	30 – 07 – 19		IIM, BLT	
	15	01 – 08 – 19		Design examples	
	16	02 – 08 – 19		Analog and digital frequency transformations	
Module 3: **FIR Digital Filters**					
	17	06 – 08 – 19		Characteristics, frequency response	
	18	07 – 08 – 19		Linear phase filter	
	19	08 – 08 – 19		Design with Window techniques	
	20	09 – 08 – 19		Design with Window techniques	
		13 – 08 – 19			UT 1
	21	20 – 08 – 19		Design with Window techniques	
	22	21 – 08 – 19		Frequency sampling technique	
	23	22 – 08 – 19		Comparison of IIR and FIR	Assignment 2
Module 4: **Finite Word Length Effects in Digital Filters**					
9	24	27 – 08 – 19		Number representations	
	25	28 – 08 – 19		Quantization and Rounding, Quantization errors	
	26	29 – 08 – 19		Limit cycle oscillations	
	27	30 – 08 – 19		Quantization in floating point realization	
	28	11 – 09 – 19		Quantization effects on Filters	
Module 5: **Multirate DSP and Filter Banks**					
10	29	12 – 09 – 19		Introduction to Multi rate processing	
	30	13 – 09 – 19		Decimator	
11	31	17 – 09 – 19		Interpolator	
	32	18 – 09 – 19		Multistage approach to sampling rate converters	

	33	19 – 09 – 19		Poly phase filter structure	
	34	20 – 09 – 19		Poly phase Decomposition	Assignment 3
Module 6: **DSP Processors and Applications**					
	35	24 – 09 – 19		Introduction to DSP processors	
	36	25 – 09 – 19		Computer architecture for DSP	
	37	26 – 09 – 19		Harward, Pipelining, MAC	
	38	01 – 10 – 19		On chip memory, Parallelism	
	39	03 – 10 – 19		Selection of DSP Processor	
	40	04 – 10 – 19		Application of DSP in Speech processing	
	41	09 – 10 – 19		Radar signal processing	Assignment 4
	42	10 – 10 – 19			
	43	11 – 10 – 19			
		14 – 10 – 19		Unit Test 2	UT 2
		18 – 10 – 19			Term END

Text Books:

1. Emmanuel C. Ifeachor, Barrie W. Jervis, "Digital Signal Processing", A Practical Approach by, Pearson Education
2. Tarun Kumar Rawat, " Digital Signal Processing", Oxford University Press, 2015 Reference

Reference Books:

1. Proakis J., Manolakis D., "*Digital Signal Processing*", 4th Edition, Pearson Education
2. Oppenheim A., Schafer R., Buck J., "*Discrete Time Signal Processing*", 2nd Edition, Pearson Education.
3. Babu R., "*Digital Signal Processing*", 4th Edition, Scitech Publications.
4. B. Venkata Ramani and M. Bhaskar, "*Digital Signal Processors, Architecture, Programming and Applications*", Tata McGraw Hill, 2004.
5. L. R. Rabiner and B. Gold, "*Theory and Applications of Digital Signal Processi*ng", Prentice-Hall of India, 2006.
6. B. Kumar, "*Digital Signal Processing*", New Age International Publishers, 2014.

Internal Assessment:

Two tests must be conducted which should cover at least 80% of syllabus. The average marks of both the tests will be considered as final IA marks

Semester End Theory Examination:

1. 1Question paper will comprise of 6 questions, each carrying 20 marks.
2. Total 4 questions need to be solved.
3: Question No.1 will be compulsory and based on entire syllabus wherein sub questions of 2 to 5 marks will be asked.
4: Remaining questions will be selected from all the modules.

Submitted By	Approved By
Prof. Narayanan Kallingal	i) Prof. Narayanan kallingal Sign:
Sign:	ii) Dr. D V Bhoir Sign:
	iii) Prof. Shilpa Patil Sign:
	iv) Prof. Monica Khanore Sign:
Date of Submission: 15 – 07 – 2019	**Date of Approval:**
Remarks by PAC (if any)	