



SWARNANDHRA
(AUTONOMOUS)

(Approved by AICTE, Accredited by NBA, NAAC,
Affiliated to JNTU KAKINADA)

SEETHARAMPURAM, NARSAPUR-534280, W.G.D.T.,

DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

TEACHING PLAN

Course Code	Course Title	Semester	Branch	Contact Period /Week	Academic Year	Semester Commence ment Date
20EC5T02	Digital signal processing (R-20)	V	ECE	5	2024-25	05-6-24

Course Outcomes

At the end of the course students are able to

- 1 Illustrate digital signals, systems and their significance. (K3)
- 2 Develop the digital signals using various digital transforms DFT, FFT etc. (K3)
- 3 Estimate the FIR and IIR structures from the designed digital filter. (K4)
- 4 Use the Multirate Processing concepts in various applications. (K3)

Unit No.	Out Come/Bloom's Level	TOPIC(S)	Reference Text book	Contact Periods	Delivery Method	
UNIT INTRODUCTION						
1	CO1: Illustrate digital signals, systems and their significance. (K3)	1.1	Introduction to Digital Signal Processing	T1, T2	1	Chalk & Talk, Smart board
		1.2	Applications & advantages of DSP	T1, T2	1	
		1.3	Discrete time signals (DTS) & sequences	T1, T2	1	
		1.4	Problems on DTS	T1, T2	2	Chalk & Talk, Smart board
		1.5	linear shift invariant systems	T1, T2	1	
		1.6	stability, and causality		1	
		1.7	Linear constant coefficient difference equations.	T1, T2	1	
		1.8	Problems on difference equations	T1, T2	1	
		1.9	Frequency domain representation of discrete time signals and systems.	T1, T2	1	
		1.10	Problems on frequency domain	T1, T2	1	
		1.11	Review of Z-transforms	T1, T2	1	Chalk & Talk, Smart board
		1.12	Solution of Difference equations using Z-transforms	T1, T2	1	
		1.13	System function	T1, T2	1	
				1.14	Class Test-1	



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TOTAL					15	
UNIT II DFS & FT						
2	CO2: Develop the digital signals using various digital transforms DFT, FFT etc. (K3)	2.1	Discrete Fourier transforms: Computation of DFT	T1, T2	1	Chalk & Talk, Smart board
		2.2	Problems	T2	1	
		2.3	Properties of DFT, linear and circular convolution of sequences using DFT	T1, T2	1	
		2.4	Problems on convolution	T2	1	
		2.5	Overlap add method, Overlap-save method	T1, T2	1	
		2.6	Problems	T2	1	
		2.7	Fast Fourier transforms (FFT) - Radix-2 decimation in time	T1	1	
		2.8	Problems	T2	1	
		2.9	Decimation in frequency FFT Algorithms.	T1	1	
		2.30	Inverse FFT		1	
		2.31	Class Test-2		1	
TOTAL					11	
UNIT III DESIGN OF IIR DIGITAL FILTERS & REALIZATION						
3	CO3: Estimate the FIR and IIR structures from the designed digital filter. (K4)	3.1	Analog filter approximations	T1, T2	1	Chalk & Talk, Smart board
		3.2	Problems		1	
		3.3	Butterworth filter	T1, T2	1	
		3.4	Problems		1	
		3.5	Chebyshev filter	T2	1	
		3.6	Problems	T2	1	
		3.7	Design of IIR digital filters from analog filters,	T1, T2	1	
		3.8	Problems	T1, T2	1	
		3.9	Design examples : Analog-Digital transformations	T1, T2	1	
		3.10	Problems	T1, T2	1	
		3.11	Class Test-3		1	
TOTAL					11	
CYCLE-I EXAM						
UNIT IV DESIGN OF FIR DIGITAL FILTERS & REALIZATION						
		4.1	Characteristics of FIR Digital Filters	T1	1	Chalk & Talk, Smart
		4.2	Problems	T1	1	



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4	CO3: Estimate the FIR and IIR structures from the designed digital filter. (K4)	4.3	Frequency response Design of FIR Digital Filters using Window Techniques	T1, T2	1	board		
		4.4	Window (Gibbs phenomenon)	T1	1			
		4.5	Problems on Windows	T1	1			
		4.6	Frequency Sampling technique		1			
		4.7	Problems	T1, T2	1			
		4.8	Comparison of IIR & FIR filters	T1	1			
		4.9	Applications	T1	1			
		4.10	Basic structure of FIR systems	T1	1			
		4.11	Lattice structures	T1, T2	1			
		4.12	Lattice ladder structures	T1, T2	1			
		4.13	Class Test-4		1			
		TOTAL						13
		UNIT V MULTIRATE DIGITAL SIGNAL PROCESSING						
5	CO4: Use the Multirate Processing concepts in various applications. (K3)	5.1	Introduction	T1, T2	1	Chalk & Talk, Smart board		
		5.2	Down sampling, Decimation	T2	1			
		5.3	Up sampling, Interpolation	T1, T2	1			
		5.4	Problems	T2	1			
		5.5	Sampling rate conversion	T2	1			
		5.6	Conversion of band pass signals	T2	1			
		5.7	Concept of resampling	T2	1			
		5.8	Applications of multi rate sampling	T2	1			
		5.9	DSP processors	T2	1			
		5.10	Class Test-5		1			
TOTAL					10			
Content beyond syllabus		Architecture of TMS320C5X			2			
		TOTAL			62			

AUTHORS/BOOK TITLE/EDITION(latest)/PUBLISHER/YEAR OF PUBLICATION

1. John G. Proakis, D.G.Manolakis, Digital Signal Processing: Principles, Algorithms and Applications – Pearson Education/PHI, 2018
2. A.V.Oppenheim and R.W.Schafer, Digital Signal Processing – PHI, 2017.
3. B.Venkataramani, M.Bhaskar, Digital Signal Processors - Architecture, Programming and Applications –TATA McGraw Hill, 2019.

AUTHORS/BOOK TITLE/EDITION(latest)/PUBLISHER/YEAR OF PUBLICATION

1. Andreas Antoniou, Digital Signal Processing – TATA McGraw Hill, 2006



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2. MH Hayes, Digital Signal Processing – Schaum's Outlines, TATA McGraw Hill, 2007

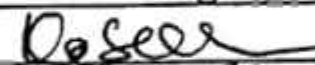
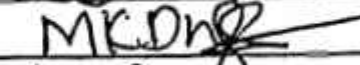
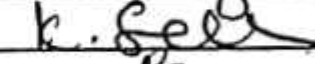

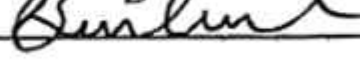
WEB Details

1. www.slideshare.net

2. www.ocw.mit.edu

3. www.gnits.ac.in/sites/default/files/ONLINERESOURCES/ECE/dsp.pdf

4. <https://lecturenotes.in/subject/44/digital-signal-processing-dsp>

		NAME	Signature with Date
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4	Module Coordinator	Dr. B. Sada Siva Rao	
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Dr. S. Suresh Kumar