



SWARNANDHRA

COLLEGE OF ENGINEERING & TECHNOLOGY

(AUTONOMOUS)

Accredited by National Board of Accreditation, AICTE, New Delhi, Accredited by NAAC with "A" Grade – 3.32 CGPA Recognized under 2(f) & 12(B) of UGC Act 1956, Approved by AICTE, New Delhi, Permanent Affiliation to JNTUK, Kakinada Seetharampuram, W.G.D.T., Narsapur-534280, (Andhra Pradesh)

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING TEACHING PLAN

Code	Course Title	Sem	Branch	Contact Periods/ Week	Academic Year	Date Of Commencement Of Semester
23EC5T02	Digital Communications	5	ECE	5	2025-2026	9/7/2025

Course Outcomes: After Successful Completion of This Course, Students Should be Able To:

CO1	Describe Basic Components of Digital Communication Systems and to Determine The Performance of Different Pulse Digital Modulation Techniques. (K2)
CO2	Determine The Performance of Digital Modulation Techniques for The Generation and Digital Representation of The Signals. (K3)
CO3	Design Optimum Receiver For Digital Modulation Techniques and To Determine The Probability of Error for Various Digital Modulation Schemes. (K3)
CO4	Compute and Analyze Error Detecting and Error Correction Codes Block Codes, Cyclic Codes, Convolution Codes and Turbo Codes. (K4)

Unit	Outcome/ Bloom's Level	Topic No	Topics/ Activity	Text Books / Reference Books	Content Hour	Delivery Method
I	CO1: Describe Basic Components of Digital Communication Systems and to Determine The Performance of Different Pulse Digital Modulation Techniques. (K2)	Pulse Digital Modulation				Talk, Chalk, Smart Board, PPT
		1.1	Elements of Digital Communication Systems	T1, T2, R1	1	
		1.2	Advantages of Digital Communication Systems	T1, R1, R2	1	
		1.3	Elements of PCM: Sampling	T1, T2, T3	1	
		1.4	Quantization & Coding	T1, R1, R2	1	
		1.5	Quantization Error	T1, R1, R2	1	
		1.6	Companding In PCM Systems	T1, T2, R1	1	
		1.7	Differential Pulse Code Modulation Systems (DPCM).	T1, T2, R1	1	
		1.8	Delta Modulation	T1, R1, R2	1	
		1.9	Delta Modulation Draw Backs	T1, R1, R2	1	
		1.10	Adaptive Delta Modulation	T2, R1, R2	1	

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		1.11	Comparison of PCM and DM Systems	T2, R1, R2	1	
		1.12	Noise In PCM and DM Systems	T2, T3, R2	1	
		1.13	Time Division Multiplexing	T1, T3, R2	1	
		1.14	Frequency Division Multiplexing	T3, R2, R3	1	
			Total		14	
		Digital Modulation Techniques				
II	CO2: Determine The Performance of Digital Modulation Techniques for The Generation and Digital Representation of The Signals. (K3)	2.1	Introduction to Digital Modulation Techniques	T1, T2, T3	1	Talk, Chalk, Smart Board, PPT
		2.2	Amplitude Shift Keying (ASK)	T1, R1, R3	1	
		2.3	Frequency Shift Keying (FSK)	T2, T3, R2	1	
		2.4	Phase Shift Keying (PSK)	T3, R2, R3	1	
		2.5	Differential Phase Shift Keying (DPSK),	T2, R1, R2	1	
		2.6	Differential Encoded Phase Shift Keying (DEPSK)	T2, R1, R2	1	
		2.7	Quadrature Phase Shift Keying (QPSK)	T1, T2, R1	1	
		2.8	M-Ary PSK	T1, T2, R1	1	
		2.9	M-Ary ASK	T1, T2, T3	1	
		2.10	M-Ary FSK	T1, T2, T3	1	
		2.11	Similarity Of BFSK and BPSK	T1, R1, R2	1	
			Total		11	
		Data Transmission				
III	CO3: Design Optimum Receiver For Digital Modulation Techniques and To Determine The Probability of	3.1	Base Band Signal Receiver	T1, T2, R1	1	Talk, Chalk, Smart Board, PPT
		3.2	Probability of Error	T1, R1, R2	1	
		3.3	The Optimum Filter	T1, R1, R2	1	
		3.4	Matched Filter	T1, T2, T3	1	
		3.5	Probability of Error Using Matched Filter	T1, T2, T3	1	
		3.6	Coherent Reception	T1, R1, R2	1	
		3.7	Non-Coherent Detection of FSK	T1, R1, R2	1	



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	Error for Various Digital Modulation Schemes. (K3)	3.8	Calculation of Error Probability of ASK, BPSK	T1, R1, R2	1	
		3.9	Calculation of Error Probability of BFSK, QPSK	T1, R1, R2	1	
				Total	9	
Linear Block Codes						
IV	CO4: Compute and Analyze Error Detecting and Error Correction Codes Block Codes, Cyclic Codes, Convolution Codes and Turbo Codes. (K4)	4.1	Introduction to Linear Block Codes	T1, R1, R2	1	Talk, Chalk, Smart Board, PPT
		4.2	Matrix Description of Linear Block Codes	T1, T2, R1	1	
		4.3	Error Detection and Error Correction	T1, T2, R1	1	
		4.4	Capabilities of Linear Block Codes	T1, T2, R1	1	
		4.5	Hamming Codes	T1, R1, R2	1	
		4.6	Hamming Codes	T1, T2, R1	1	
		4.7	Binary Cyclic Codes	T2, R1, R2	1	
		4.8	Binary Cyclic Codes	T2, R1, R2	1	
		4.9	Algebraic Structure	T2, T3, R2	1	
		4.10	Encoding	T1, T3, R2	1	
		4.11	Syndrome Calculation	T1, T3, R2	1	
		4.12	Bch Codes	T3, R2, R3	1	
		4.13	Bch Codes	T3, R2, R3	1	
				Total	13	
Convolution Codes						
V	CO4: Compute and Analyze Error Detecting and Error Correction Codes Block Codes, Cyclic Codes, Convolution Codes and Turbo Codes. (K4)	5.1	Introduction	T1, R1, R2	1	Talk, Chalk, Smart Board, PPT
		5.2	Encoding Of Convolution Codes	T1, T2, R1	1	
		5.3	Encoding of Convolution Codes	T1, T2, R1	1	
		5.4	Time Domain Approach	T1, T2, R1	1	
		5.5	Time Domain Approach	T1, T2, R1	1	
		5.6	Transform Domain Approach	T1, R1, R2	1	
		5.7	Transform Domain Approach	T1, R1, R2	1	
		5.8	Graphical Approach: State	T2, R1, R2	1	
		5.9	Graphical Approach: Tree	T2, R1, R2	1	
		5.10	Graphical Approach:	T2, R1, R2	1	



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		Trellis Diagram			
	5.11	Decoding Using Viterbi Algorithm	T2, T3, R2	1	
	5.12	Decoding Using Viterbi Algorithm	T2, T3, R2	1	
	5.13	Turbo Codes	T1, T3, R2	1	
	5.14	Turbo Codes	T1, T3, R2	1	
		Total		14	
		Total		61	
CONTEND BEYOND SYLLABUS					
		Information Theory	T1, T3, R2	1	
		Information Theory	T1, T3, R2	1	
		Total		2	
		CUMULATIVE PROPOSED PERIODS		63	

Text Books

1	Digital Communications - Simon Haykin, John Wiley, 2005
2	Principles Of Communication Systems - H. Taub And D. Schilling, Tmh, 2003
3	Digital Communications- J.Das, S.K.Mullick, P.K.Chatterjee, John Willy & Sons, 1986.

Reference Books

1	Digital And Analog Communication Systems - Sam Shanmugam, John Wiley, 2005
2	Digital Communications - John Proakis, Tmh, 1983. Communication Systems Analog & Digital - Singh & Sapre, Tmh, 2004
3	Modern Analog And Digital Communication - B. P. Lathi, Oxford Reprint, 3rd Edition, 2004

Sl. No		NAME	SIGNATURE
I	Faculty-I	MR. K. V. B. CH. SEKHAR RAO	
II	Faculty-II	MRS. G SANTHI KUMARI	
III	Course Coordinator	MR. K. V. B. CH. SEKHAR RAO	
IV	Module Coordinator	DR. SEKHAR DIDDE	
V	Program Coordinator	DR. B. S. RAO	



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