Digital Communications

Course Code	23EC3502	**Year**	III	**Semester**	I
Course Category	PC	**Branch**	ECE	**Course Type**	Theory
Credits	3	**L-T-P**	3-0-0	**Prerequisites**	Analog Communications
Continuous Internal Evaluation	30	**Semester End Evaluation:**	70	**Total Marks**	100

Course Outcomes		
Upon successful completion of the course, the student will be able to		**BL**
CO1	Construct different Baseband Digital Modulation Systems	L3
CO2	Analyze different parameters of digital Band pass modulation Techniques	L4
CO3	Analyze different parameters of Spread Spectrum modulation Techniques	L4
CO4	Develop various Source Coding techniques	L3
CO5	Build Coding sequences for different error correcting codes	L3

Contribution of Course Outcomes towards achievement of Program Outcomes
1- Low 2-Medium 3-High

	PO1	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PSO1**	**PSO2**
CO1	3										2	3	
CO2	3	3									2	3	
CO3	3	3									2	3	
CO4	3	3									2	3	
CO5	3										3	3	
Avg.	3	3									2	3	

Syllabus		
Unit No	**Contents**	**Mapped CO**
1	**Baseband modulation Techniques:** Introduction, Pulse code modulation, DPCM, Delta modulation, ADM, output Signal to quantization Noise ratio in PCM and DM systems, Line Codes.	CO1
2	**Band Pass Transmission of Digital Signals:** Introduction, Band Pass Transmission model, ASK,FSK,PSK,DPSK,QPSK, M-ary PSK and M-ary FSK, Probability of error in FSK and PSK	CO2
3	**Spread-Spectrum Modulation**: Introduction, Pseudo-Noise Sequences, Direct sequence spread spectrum, Processing Gain, Jamming margin, Frequency Hopping Spread spectrum, Slow frequency Hopping, Fast Frequency Hopping.	CO3
4	**Information Theory:** Introduction, information, Entropy, Source Coding Theorem, Shannon-Fano coding, Huffman coding, LZ algorithm, Discrete memory-less channels, Mutual information, Channel Capacity, Channel Coding Theorem , Capacity of a Gaussian channel.	CO4
5	**Error Control Coding:** Introduction, Linear Block codes, Cyclic Codes, Encoder, Syndrome calculator, Convolutional Codes, Code Tree, Trellis and State diagram, The Viterbi Algorithm.	CO5

Learning Resources
Text Books
1. Simon Haykin,Michael Moher, Communication Systems, Wiley India, 5th Ed., 2022 2. John G Proakis, Masoud Salehi ,Digital Communications ,McGraw Hill Education , 5th Ed., 2014
Reference Books
1. H Taub & D. Schilling, Gautam Sahe, . Principles of Communication Systems, Mc Graw Hill Education, 4th Ed.,2013 2. Sam Shanmugam, Analog and Digital Communication System ,John Wiley and Sons,3rd Ed.,2009
e- Resources & other digital material
1. https://www.youtube.com/playlist?list=PLC7D3EAEFA0CC0420&app=desktop 2. https://nptel.ac.in/courses/108/105/108105159/