

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	PO12	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, 5 th Ed., 2022
2.	John G Proakis, Masoud Salehi, Digital Communications, McGraw Hill Education, 5 th Ed., 2014
Reference Books	
1.	H Taub & D. Schilling, Gautam Sahe, . Principles of Communication Systems, Mc Graw Hill Education, 4 th Ed., 2013
2.	Sam Shanmugam, Analog and Digital Communication System, John Wiley and Sons, 3 rd 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/