DIGITAL COMMUNICATIONS

Course Code	20EC3501	Year	III	Semester	I
Course Category	Program Core	Branch	ECE	Course Type	Theory
Credits	3	L-T-P	3-0-0	Prerequisites	Communication Theory
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	
CO1	Construct different Baseband Digital Systems (L3)
CO2	Analyze the parameters of digital Passband and Spread Spectrum modulation Techniques (L4)
CO3	Develop various Source Coding techniques (L3)
CO4	Build Coding sequences for different error correcting codes (L3)

Mapping of course outcomes with Program outcomes (CO/ PO/PSO Matrix)
Note: 1- Weak correlation   2-Medium correlation   3-Strong correlation
   * - Average value indicates course correlation strength with mapped PO

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	2													
CO2	3								2	2		2	3	
CO3	3								2	2		2	3	
CO4		3							3	3		3	3	
Average	3	3							2	2		2	3	

Syllabus		
Unit	Contents	Mapped CO
I	**Waveform Coding Techniques:** Introduction, Pulse code modulation (PCM), DPCM, Delta modulation(DM), ADM, output Signal to quantization Noise ratio in PCM and DM systems, Line Codes, Intersymbol interference, Correlative coding.	CO1,CO2
II	**Digital Modulation Techniques:** Introduction, Gram Schmidt Orthogonalization procedure, Correlation receiver, Matched filter, Coherent Phase Shift Keying, Quadrature Phase Shift Keying, Differential Phase Shift keying. Coherent and Non Coherent Frequency Shift Keying, M-ary PSK and M-ary FSK.	CO1,CO2
III	**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.	CO1,CO2

IV	**Information Theory:** Introduction, information, Entropy, Source Coding Theorem, Lossless Data Compression, ,Shannon-Fano coding, Huffman coding, Lempel-Ziv Coding, Discrete memoryless channels, Mutual information, Channel Capacity, Channel Coding Theorem , Information Capacity Theorem		CO2,CO3
V	**Error Control Coding:** Introduction, Linear Block codes, Syndrome and its Properties, Syndrome Decoding, Cyclic Codes, Encoder, Syndrome calculator, Convolutional Codes, Code Tree, Trellis and State diagram, The Viterbi Algorithm.		CO4

Learning Resources
Text Books:
1. Simon Haykin -Digital communications -, John Wiley, 4th Edition 2010 2. John G Proakis -Digital Communications –, McGraw Hill , 5th Edition, 1995
Reference Books
1. H Taub & D. Schilling, Gautam Sahe -Principles of Communication Systems –, TMH, 3rd Ed.,2007 **2.** Sam Shanmugam -Analog and Digital Communication System-, John Wiley and Sons,3rd Edition,2009 3. A B Carlson - Communication systems –, McGraw-Hill, 4th Edition,2002 4. B Sklar- Digital communications -, Pearson Education, 2nd Edition, 2013
e- Resources & other digital material
1.https://www.youtube.com/playlist?list=PLC7D3EAEFA0CC0420&app=desktop 2.https://nptel.ac.in/courses/108/105/108105159/