

EC8501 DIGITAL COMMUNICATION

DETAILED SYLLABUS

OBJECTIVES:

- To know the principles of sampling & quantization
- To study the various waveform coding schemes
- To learn the various baseband transmission schemes
- To understand the various band pass signaling schemes
- To know the fundamentals of channel coding

UNIT I INFORMATION THEORY

Discrete Memoryless source, Information, Entropy, Mutual Information - Discrete Memoryless channels – Binary Symmetric Channel, Channel Capacity - Hartley - Shannon law - Source coding theorem - Shannon - Fano & Huffman codes.

UNIT II WAVEFORM CODING & REPRESENTATION

Prediction filtering and DPCM - Delta Modulation - ADPCM & ADM principles-Linear Predictive Coding- Properties of Line codes- Power Spectral Density of Unipolar / Polar RZ & NRZ – Bipolar NRZ - Manchester

UNIT III BASEBAND TRANSMISSION & RECEPTION

ISI – Nyquist criterion for distortion less transmission – Pulse shaping – Correlative coding – Eye pattern – Receiving Filters- Matched Filter, Correlation receiver, Adaptive Equalization

UNIT IV DIGITAL MODULATION SCHEME

Geometric Representation of signals - Generation, detection, PSD & BER of Coherent BPSK, BFSK & QPSK - QAM - Carrier Synchronization - Structure of Non-coherent Receivers – Principle of DPSK.

UNIT V ERROR CONTROL CODING

Channel coding theorem - Linear Block codes - Hamming codes - Cyclic codes – Convolutional codes - Viterbi Decoder.

TEXT BOOK:

1. S. Haykin, —Digital CommunicationsII, John Wiley, 2005 (Unit I –V)

REFERENCES

1. B. Sklar, —Digital Communication Fundamentals and ApplicationsII, 2nd Edition, Pearson Education, 2009
2. B.P.Lathi, —Modern Digital and Analog Communication SystemsII 3rd Edition, Oxford University Press 2007.
3. H P Hsu, Schaum Outline Series - —Analog and Digital CommunicationsII, TMH 2006
4. J.G Proakis, —Digital CommunicationII, 4th Edition, Tata Mc Graw Hill Company, 2001.