

SEMESTER V

DIGITAL COMMUNICATION

(COMMON FOR ECE & ETCE)

1. BASEBAND TRANSMISSION & DETECTION

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Formatting analog information – Sampling theorem, aliasing. Uniform and non – uniform Quantization. Base band modulation – waveform representation of binary digits. Signals and noise – error performance degradation in communication systems – demodulation/detection. Detection of binary signals in Gaussian noise. Matched filter, maximum likelihood receiver, Inter Symbol Interference. Equalisation - channel characterization and eye pattern.

2. BANDPASS TRANSMISSION & DETECTION

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Digital band pass modulation techniques – ASK, FSK, PSK, and QPSK. Detection of signals in Gaussian noise. Correlation receiver – coherent and non-coherent detection of PSK and FSK. Error performance for binary systems. Comparison of bit error performance of binary systems. M – ary signaling – Symbol error performance of M – ary systems – probability of symbol error for MPSK, MFSK. Effects of Inter Symbol Interference

3. SYNCHRONISATION

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Approach and assumptions, Cost aspects, Receiver Synchronization – Frequency and phase synchronization, Symbol Synchronization – Discrete Symbol modulations, Synchronization with continuous phase modulation. Frame Synchronization, Network Synchronization - Open loop transmitter Synchronization, Closed loop transmitter Synchronization

4. SPREAD SPECTRUM TECHNIQUES

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Attributes of spread spectrum systems, Pseudo noise sequences – randomness properties, shift register sequences, Direct sequence spread spectrum systems, Frequency hopping systems, Synchronization, Jamming considerations – broad band noise jamming, partial band noise jamming, multiple tone jamming, pulse jamming, repeat back jamming.

5. ENCRYPTION & DECRYPTION:

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Models, goals and early cipher systems – model encryption and decryption, system goals. Secrecy of cipher systems – perfect secrecy, entropy and equivocation, ideal secrecy. Practical security – confusion and diffusion, substitution, permutation. Data encryption standard, Stream Encryption – Public key Encryption system.

TOTAL HOURS: 45

TEXT BOOKS:

1. Digital Communication- Bernard Sklar, Pearson Education Ltd, 2 / e 2001.

REFERENCE BOOKS:

1. Simon Haykin, “Digital Communication”, John Wiley and Sons, 1988.
2. John Proakis, “Digital Communication”, TMH, 4th edition
3. Taub and Schilling, “Principles of Communication Systems”, TMH Ltd,
4. R.F.Z Ziemer and W.H. Tramer, “Principles of Communication”, Jaico Publishing