Course title: **Elective-III: Digital & Mobile Communication**

**Unit - I**

Introduction - Historical Developments - Sources & Signals - Basic Signal Processing operations in Digital Communications - Channels for Digital communications - Uncertainty, Information and Entropy - Source Coding Theorem - Huffman Coding - Discrete Memory less Channels - Mutual Information - Channel Capacity - Channel Coding Theorem - Differential Entropy and Mutual Information for Continuous Ensembles - Channel Capacity Theorem.

**Unit - II**

Sampling Theorem - Quadrature Sampling of Band Pass signals - Reconstruction of a Message Process from its Samples - Signal Distortion in Sampling - Practical Aspects of Sampling and Signal Recovery - Pulse Amplitude Modulation - Time Division Multiplexing.

**Unit - III**

Pulse Code Modulation - Channel Noise and Error Probability - Quantization noise and Signal to noise ratio - Robust Quantization - Differential Pulse code Modulation - Delta Modulation - Coding Speech at Low Bit Rates - Applications - Discrete PAM Signals - Power Spectra of Discrete PAM Signals – Inter symbol Interference - Nyquist’s Criterion for Distortion less Baseband Binary Transmission - Correlative Coding - Eye Pattern - Baseband M-ary PAM Systems - Adaptive Equalization for Data Transmission.

**Unit - IV**

Digital Modulation Formats - Coherent Binary Modulation Techniques - Coherent Quadrature - Modulation Techniques - Noncoherent Binary Modulation Techniques - Comparison of Binary and Quaternary Modulation Techniques - M-ary Modulation Techniques - Power Spectra - Bandwidth Efficiency - M-ary Modulation Formats Viewed in the Light of the channels capacity theorem - Effect of Inter symbol Interference - Bit Versus Symbol Error Probabilities - Synchronization – Applications.

**Unit - V:**

Introduction to Mobile Communications - Introduction to Cellular Systems - GSM Architecture - Layer Modeling - Transmission - Data Service - Multiple Access Scheme - Channel Coding Interleaving - Radio resource management - Mobility management – Communication management - Network management - TDMA Architecture - Transmission and Modulation - CDMA – Terms of CDMA - Call Processing - Hand over Procedures.

**Book for Study:**

1. Simon Haykin - Digital Communications, John Wiley & sons, 2005 (Unit – I- IV)

2. William C.Y. Lee - Mobile Cellular Telecommunication, McGraw Hill Publications, 1995 (Unit - V)