CU5071 DIGITAL COMMUNICATION RECEIVERS

DETAILED SYLLABUS

UNIT I REVIEW OF DIGITAL COMMUNICATION TECHNIQUES

Base band communication; signal space representation, linear and nonlinear modulation techniques, Error tracking and Spectral characteristics of digital modulation.

UNIT II OPTIMUM RECEIVERS FOR AWGN CHANNEL

Correlation demodulator, matched filter , maximum likelihood sequence detector, optimum receiver for CPM signals, optimum receivers for signals with random phase in AWGN channel, envelope detection of M-ary orthogonal signals and correlated binary signals.

UNIT III RECEIVERS FOR FADING CHANNELS

Characterization of fading multiple channels, statistical models, flat and frequency selective fading, diversity technique, parameter synchronization for flat fading channels, digital signaling over a frequency selective and slowly fading channel, coded waveform for fading channel.

UNIT IV SYNCHRONIZATION TECHNIQUES

Carrier and signal synchronization, carrier phase estimation-PLL, Decision directed loops, symbol timing estimation, maximum likelihood and non-decision directed timing estimation, joint estimation.

UNIT V ADAPTIVE EQUALIZATION

Zero forcing algorithm, LMS algorithm, adaptive decision-feedback equalizer and Equalization of Trellis-coded signals. Kalman algorithm, blind equalizers and stochastic gradient algorithm.

OBJECTIVES:

To understand the basic principles of digital communication techniques.

To gain knowledge about receivers for AWGN channel and Fading channels.

To understand the concepts of synchronization and adaptive equalization techniques.

REFERENCES:

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4. R.G. Gallager, "Principles of Digital Communication", Newyork, Cambridge University Press, 2008

5. Simon Marvin, “Digital communication over fading channel; An unified approach to performance Analysis ", John Wiley, New York, 2000.

6. U.Mengali & A.N.D"Andrea, Synchronization Techniques for Digital Receivers, Kluwer, 1997.