

PCEC4302 **ANALOG COMMUNICATION TECHNIQUES** (3-0-0)

Module-I : (12 Hours)

SIGNALS AND SPECTRA:An Overview of Electronic Communication Systems, Signal and its Properties, Fourier Series Expansion and its Use, The Fourier Transform, Orthogonal Representation of Signal.

RANDOM VARIABLES AND PROCESSES: Probability, Random variables, Useful Probability Density functions, Useful Properties and Certain Application Issues.

AMPLITUDE MODULATION SYSTEMS: Need for Frequency translation, Amplitude Modulation(*Double Side Band with Carrier DSB-C*),Single Sideband Modulation(SSB) Other AM Techniques and Frequency Division Multiplexing ,Radio Transmitter and Receiver.

Module-II : (12 Hours)

ANGLE MODULATION: Angle Modulation, Tone Modulated FM Signal, Arbitrary Modulated FM signal, FM Modulators and Demodulators, Approximately Compatible SSB Systems.

PULSE MODULATION AND DIGITAL TRANSMISSION OF ANALOG SIGNAL:

Analog to Digital(*Noisy Channel and Role of Repeater*), Pulse Amplitude Modulation and Concept of Time division multiplexing ,Pulse Width Modulation and Pulse Position Modulation, Digital Representation of Analog Signal.

Module-III : (14 Hours)

MATHEMATICAL REPRESENTATION OF NOISE:Some Sources of Noise, Frequency-domain Representation of Noise ,Superposition of Noises, Linear Filtering of Noise.

NOISE IN AMPLITUDE MODULATION SYSTEM : Framework for Amplitude Demodulation, Single Sideband Suppressed Carrier(SSB-SC), Double Sideband Suppressed Carrier(DSB-SC), Double Sideband With Carrier(DSB-C).

NOISE IN FREQUENCY MODULATION SYSTEM : An FM Receiving System, Calculation of Signal to Noise Ratio, Comparison of FM and AM, Preemphasis and Deemphasis and SNR Improvement, Noise in Phase Modulation and Multiplexing Issues, Threshold in Frequency Modulation, Calculation of Threshold in an FM Discriminator, The FM Demodulator using Feedback(FMFB).

Text Book:

1. H. Taub, D. L Schilling, G. Saha; *Principles of Communication System, 3rd Edition; 2008, Tata McGraw Hill, India;* ISBN: 0070648115. (**Selected portions from chapters:** Chapter-1,Chapter-2, Chapter-3, Chapter-4, Chapter-5, Chapter-7, Chapter-8, Chapter-9)

Supplementary Reading:

1. Communication System Engineering,Second Edition by Masoud Salehi, John G. Proakis, ISBN: 0130950076 (paperback)
2. Analog Communication by Chandra Sekar, Oxford University Press.
3. Modern Digital and Analog Communication Systems, by B.P. Lathi, Oxford