

ECE324: Digital Communication Lab

Programme: B.Tech. (ECE)

Year: III

Semester: V

Course: Core for CCE, and ECE

Credits: 2

Hours: 40

Description:

1. Hardware Experiments:

- a. Experiment on digital signaling pulse formats: Random data generation and power spectrum density plots of NRZ/ RZ/ Manchester coded data.
- b. Experiment on data sampling, quantization, encoding, and reconstruction of signal: Pulse code modulation (PCM).
- c. Delta modulation.
- d. Data clock recovery.
- e. Time-division multiplexing and de-multiplexing.
- f. Digital modulation and demodulation of amplitude shift keying (ASK).
- g. Digital modulation and demodulation of binary phase shift keying (BPSK).
- h. Digital modulation and demodulation of frequency shift keying (FSK).
- i. BER measurement of a base-band communication link.

2. Simulation Based Experiments:

- a. Simulating power spectral density plots of RZ and Manchester coded random data.
- b. Simulating a base-band digital communication link.
- c. Generate a random process with a Rayleigh PDF.
- d. Simulate a rate-half constraint length $K = 3$ convolution code encoder and decoder.

3. Projects:

- a. Design a DPSK modulator and a demodulator.
- b. Design a carrier recovery circuit using PLL.
- c. Design of a 256-carrier OFDM transmitter.
- d. Implementing a 64-ary QAM transmitter using FPGA.