

EC-354

DIGITAL COMMUNICATION LAB

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- - 3 2**COURSE OBJECTIVES:**

1. To verify PCM and calculate analog to digital conversion error.
2. To verify Frequency Shift Keying and Phase Shift Keying functionality in time domain, companding scheme.
3. To be familiar with software implementation of communication concepts

COURSE OUTCOMES:**After successful completion of the course, the students are able to**

1. demonstrate Waveform Coding Techniques and Digital Modulation Techniques.
2. simulate Digital Modulation Techniques.
3. simulate Line Codes and PCM.
4. simulate different Source Coding Techniques Channel Capacity Theorem.

List of Experiments:**Experiments based on Hardware:**

1. Generation and Detection of PCM.
2. Generation and Detection of ASK.
3. Generation and Detection of FSK
4. Generation and Detection of PSK.
5. Generation and Detection of QPSK.
6. Generation and Detection of DPSK.
7. Delta Modulation and Demodulation.
8. Generation and Detection of DPCM.

Simulation Experiments:

1. Generation a sinusoidal signal with amplitude 2, and using a uniform PCM scheme,quantize it once to 8 levels and once to 16 levels.Plot the original signal and the quantized signals on the same axis.Compare the resulting SQNR in the two cases.
2. Design a Huffman code for an information source with probabilities $p=\{0.1,0.05,0.21,0.07,0.02,0.2,0.2,0.15\}$.Determine the efficiency of the code by computing the average codeword length and the entropy of the source.
3. Generate the basic pulse shape,NRZ,RZ, half sinusoid and raised cosine pulses.Generate eye diagrams of binary polar signaling
4. Write a program to generate any digital modulation (ASK,PSK,FSK) and demodulation scheme.
5. Determine the output of a convolutional encoder when the information sequence is 10011100110000111.
6. Plot the capacity of an additive white Gaussian Noise channel with a bandwidth of 3000Hz as a function of signal to noise power.
7. Find all the codewords of the (15,11) Hamming code and verify that the minimum distance is equal to 3.

Note: A minimum of 10(Ten) experiments have to be Performed and recorded by the candidate to attain eligibility for Semester End Practical Examination.