ECE324 : Digital Communication Lab

Programme: B. Tech. (ECE and CCE) Year: 3rd Semester: ODD
Course Type: Core Credits: 2 Hours: 30

Course Context and Overview (100 words):

The objective of the course is that student would appreciate the significance and different applications of digital communications. Understand and analyze the various blocks of commutation system. They would be able to feel the importance of digital communication in daily life. They would be also able to implement different modulation techniques, error control coding using MATLAB.

Prerequisites Courses:

Principles of Communication

Course Outcomes (COs):

On completion of this course, the students will have the ability to:
CO1: Design, analyze and implement digital continuous and pulse modulation.
CO2: Design, generate and study various line-coding techniques used in Communication.
CO3: Design non-coherent demodulation and clock recovery circuit.
CO4: Design and implement Matched Filter Receiver
CO5: Design and implement linear block coding, convolutional encoding and decoding in MATLAB.

Course Topics:

Topics	Lab Sessions	Hours
UNIT - I 1. Topic Digital Pulse Modulation	2	6
1.1 Hardware implementation and analysis of Delta modulation and demodulation.	1	
1.2 Hardware implementation and analysis of various line codes i.e. RZ, NRZ, and Manchester	1	
UNIT - II 2. Topic Digital Continuous wave Modulation	3	9
2.1 Hardware implementation and analysis of BPSK modulation and demodulation	1	
2.2 Non-coherent detection and clock recovery.	1	
2.3 Hardware implementation and analysis of FSK modulation and demodulation	1	

UNIT - III 3. Topic Advance Modulation Techniques	3	9
3.1 Hardware implementation and analysis of matched filter receiver.	1	
3.2 Design, implementation and analysis of Quadrature Modulation	1	
3.3 Hardware implementation and analysis of QAM demodulation	1	
UNIT – IV 4. Topic Error Control coding	2	6
4.1 Linear Block codes	1	
4.2 Convolutional coding Viterbi Algorithm	1	

Text Books:

1 Probability, Random Variables and Stochastic Processes, Papoulis et al., McGraw Hill, 3rd Ed.
2 Modern Digital and Analog Communication System, B. P. Lathi Oxford University Press, 3rd Ed.
3 Principles of Communication Systems Simulation with Wireless Applications, William H. Tranter et al ,Prentice Hall,2004, ISBN-13: 9780134947907

Evaluation Methods:

Item		Weightage
Attendance		10
Lab Record		10
Mid Term Quiz		10
End Term Quiz		10
Daily Evaluation		30
End Term Exam	Circuit	10
	Result	10
	Report	10

Grading will be relative with Mean and Variance. Mean will be set to BC. Grade will change at each standard deviation/2.