

## ECE : Digital Communication Lab

**Programme:** B.Tech. (ECE and CCE)**Year:** 3<sup>rd</sup> Year**Semester:** V<sup>th</sup>/ODD**Course:** Core for ECE & CCE Students**Credits:** 2**Hours:** 30**Course Context and Overview (100 words):**

The objective of the course is that students would appreciate the significance and different applications of digital communications. Understand and analyze the various blocks of communication 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:** 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
<b>UNIT - I</b> 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	

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<b>UNIT - II</b> 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	
<b>UNIT - III</b> 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	
<b>UNIT – IV</b> 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

**Additional Resources (NPTEL, MIT Video Lectures, Web resources etc.):**

**ECE : Digital Communication Lab****Evaluation Methods:**

Item		Weightage
Attendance		10%
Lab Report		10%
Mid Term Quiz		10%
Daily Evaluation		35%
End Term Exam	Circuit/Code/ Result	20%
	Viva	15%
<b>Total</b>		<b>100%</b>