DIGITAL COMMUNICATIONS LABORATORY

V Semester: ECE

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
AECB22	Core	-	-	2	1	30	70	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 24				Total Classes: 24		

I. COURSE OVERVIEW:

This lab course gives the hands on experience in elements of digital communication systems. The design of various coding techniques, pulse analog and digital modulations to analyse signal to noise ratio, bit error rate, power and bandwidth for digital communication systems. This lab is useful inthe digital signal processors in secured communication systems, multimedia communications and datastorage applications.

II. OBJECTIVES:

The course should enable the students to:

I	The Elements of digital communication systems to convert continuous time signals into discrete time signals.
II	The pulse analog modulation techniques, generation and detection of digitalmodulation techniques.
III	The time and frequency domain analysis of the signals in communication system by using MATLAB tools.

III. COURSE OUTCOMES:

After successful completion of the course, students should be able to:

CO 1	**Examine** sampling theorem for processing of different signals such as low pass signals, band-limited signals and band pass signals. .	Analyze
CO 2	**Classify** the pulse modulation and demodulation methods forencoded data in analog to digital conversion.	Analyze
CO 3	**Apply** the concept of pulse code modulation and demodulation for the equivalent sequence of binary code word data.	Analyze
CO 4	**Categorize** the digital modulation techniques used for transfer a digital bit stream over an analog channel at a high frequency.	Analyze
CO 5	**Determine** bit rate in delta modulation and demodulation processfor the no. of bits per sample are transmitted.	Apply
CO 6	**Develop** frequency domain description of different digital modulation techniques for spectral characteristics analysis.	Apply

LIST OF EXPERIMENTS

Week-l	**SAMPLING THEOREM – VERIFICATION**
Verification of sampling theorem for under, perfect, over sampling cases	
Week-2	**PULSE AMPLITUDE MODULATION AND DEMODULATION**
Generation of Pulse Amplitude modulation and demodulation using hardware and matlab	
Week-3	**PULSE WIDTH MODULATION AND DEMODULATION**
Generation of Pulse width modulation and demodulation using hardware and matlab	

Week-4	**PULSE POSITION MODULATION AND DEMODULATION.**
Generation of pulse position modulation and demodulation using hardware and matlab	
Week-5	**PULSE CODE MODULATION**
Generation of pulse code modulation and demodulation using hardware and understanding the concept analog to digital conversion	
Week-6	**DIFFERENTIAL PULSE CODE MODULATION**
Generation of differential pulse code modulation and demodulation using hardware	
Week-7	**DELTA MODULATION.**
Generation of delta modulation and demodulation using hardware .Understanding difference between PCM and DM	
Week-8	**FREQUENCY SHIFT KEYING**
Generation of Frequency shift keying modulation and demodulation using hardware	
Week-9	**PHASE SHIFT KEYING.**
Generation of Phase shift keying modulation and demodulation using hardware	
Week-l0	**DIFFERENTIAL PHASE SHIFT KEYING**
Generation of Differential Phase shift keying modulation and demodulation using hardware	
Week-l1	**AMPLITUDE SHIFT KEY(ASK)**
Generation of Amplitude Shift Key modulation and demodulation using hardware	
Week-l2	**QUADRATURE PHASE SHIFT KEYING**
Generation of QPSK modulation and demodulation using hardware	
Week-l3	**MATLAB for QPSK & SIMULINK for DPSK.**
Understand frequency domain description of Quadrature Phase Shift Keying and Differential Phase shift keying	
Week-l4	**STUDY OF THE SPECTRAL CHARACTERISTICS OF AMPLITUDE MODULATION**
Understand frequency domain description of Amplitude Modulation	

Reference Books:

1. K.SamShanmugam, “Digital and Analog Communication Systems”, Joh Wiley & Sons, 2nd Edition, 2005.
2. B.P.Lathi, “Modern Analog and Digital Communication”, Oxford reprint, 3rd Edition, 2004.
3. Singh,Sapre, “Communication Systems Analog and Digital”, TMH, 2nd Edition,2004

Web References:

1. https://ocw.mit.edu/courses/electrical.../6...digital-communications.../lecture-notes
2. https://everythingvtu.wordpress.com
3. http://www.iare.ac.in

SOFTWARE AND HARDWARE REQUIRED FOR A BATCH OF 36 STUDENTS

HARDWARE: Desktop Computer Systems 18 nos

SOFTWARE:MATLAB