ANALOG COMMUNICATIONS LABORATORY

IV Semester: ECE

Course Code	Category	Hours / Week			Credits	Maximum Marks		
		L	T	P	C	CIA	SEE	Total
AECB16	Core	-	-	3	1.5	30	70	100
Contact Classes: Nil	Tutorial Classes: Nil	Practical Classes: 36				Total Classes:36		

OBJECTIVES:

The course should enable the students to:

I. Study various modulation techniques in communications.
II. Visualize various spectrums using spectrum analyzer.
III. Observe receiver characteristics.
IV. Understand the importance of AGC and VCO

COURSE OUTCOMES(CO):

1. Understand the basic concepts of the communication systems and illustrate different amplitude modulation techniques.
2. Analyze the time domain and frequency domain description of SSB and VSBSC and compare various amplitude modulation schemes.
3. Analyze generation and detection of FM signal and comparison between amplitude and angle modulation schemes.
4. Gain the knowledge of different noise sources and evaluate the performance of the communication system in the presence of noise.
5. Interpret with different types of receivers and study different pulse modulation and demodulation techniques.

COURSE LEARNING OUTCOMES (CLOs):

6. Generation of amplitude modulation and demodulation using hardware and MATLAB.
7. Generation of AM-Double Side Band Suppressed Carrier (DSB-SC) signal using Balanced Modulator.
8. Generation of single side band suppressed carrier modulation and demodulation using hardware and MATLAB.
9. Generation of frequency modulation and demodulation using hardware and MATLAB.
10. Verification of pre-emphasis and de-emphasis to boost high frequency modulating signal using hardware and MATLAB.
11. Verification of sampling theorem for under, perfect, over sampling cases using hardware and MATLAB.
12. Generation of the frequency division multiplexing and demultiplexing circuit.
13. To study the operation of Time-Division multiplexing and demultiplexing circuit.
14. To study the AGC Characteristics.
15. Study the operation of frequency synthesizer.
16. Obtain the mixer characteristics of a super heterodyne receiver.
17. To study the spectral characteristics of AM and FM using spectrum analyzer.
18. To generate AM-Double Side Band Suppressed Carrier (DSB-SC) signal using Ring Modulator.
19. To compare the theoretical and practical values of capture range and lock range of phase locked loop.

LIST OF EXPERIMENTS

WEEK-1	AMPLITUDE MODULATION AND DEMODULATION

Generation of amplitude modulation and demodulation using hardware and MATLAB.

WEEK-2	**DSB-SC MODULATOR & DETECTOR**
Generation of AM-Double Side Band Suppressed Carrier (DSB-SC) signal using Balanced Modulator.	
WEEK-3	**SSB-SC MODULATOR & DETECTOR (PHASE SHIFT METHOD)**
Generation of single side band suppressed carrier modulation and demodulation using hardware and MATLAB.	
WEEK-4	**FREQUENCY MODULATION AND DEMODULATION**
Generation of frequency modulation and demodulation using hardware and MATLAB.	
WEEK-5	**PRE-EMPHASIS & DE-EMPHASIS**
Verification of pre-emphasis and de-emphasis to boost high frequency modulating signal using hardware and MATLAB.	
WEEK-6	**SAMPLING THEOREM VERIFICATION**
Verification of sampling theorem for under, perfect, over sampling cases using hardware and MATLAB.	
WEEK-7	**FREQUENCY DIVISION MULTIPLEXING & DE MULTIPLEXING**
Generation of the frequency division multiplexing and demultiplexing circuit.	
WEEK-8	**TIME DIVISION MULTIPLEXING & DE MULTIPLEXING**
To study the operation of Time-Division multiplexing and demultiplexing circuit.	
WEEK-9	**AGC CHARACTERISTICS**
To study the AGC Characteristics	
WEEK-10	**FREQUENCY SYNTHESIZER**
Study the operation of frequency synthesizer.	
WEEK-11	**CHARACTERISTICS OF MIXER**
Obtain the mixer characteristics of a super heterodyne receiver.	
WEEK-12	**SPECTRAL ANALYSIS OF AM AND FM SIGNALS USING SPECTRUM ANALYZER**
To study the spectral characteristics of AM and FM using spectrum analyzer	
WEEK-13	**GENERATION OF DSBSC USING RING MODULATOR**
To generate AM-Double Side Band Suppressed Carrier (DSB-SC) signal using Ring Modulator.	
WEEK-14	**PHASE LOCKED LOOP**
To compare the theoretical and practical values of capture range and lock range of phase locked loop.	
Reference Books:	
1. Devdas Shetty, Richard A. Kolk (2011), Mechatronics System Design, PWS Publishing Company. 2. Dan Necsulescu, (2002), ―Mechatronics, 3rd Edition, Pearson Education. 3. Michael B. Histand and David G. Cacciatore (2005), ―Introduction to Mechatronics and	

Measurement systems, McGraw-Hill.
Web References:
1. https://ocw.mit.edu/courses/electrical.../6...analog-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 No. **SOFTWARE:**MATLAB