

COMPUTER NETWORKS

IV Semester: ECE								
Course Code	Category	Hours / Week			Credits	Maximum Marks		
AECB12	Core	L	T	P	C	CIA	SEE	Total
		3	1	3	4	30	70	100
Contact Classes: 45	Tutorial Classes: Nil	Practical Classes: Nil			Total Classes: 45			
<p style="color: blue; margin: 0;">COURSE OBJECTIVES:</p> <p style="margin: 0;">Students will try to learn:</p> <p>I The elementary signals, fundamental elements of analog communication systems.</p> <p>II The need of modulation, generation and detection techniques of analog and pulse modulation systems.</p> <p>III The influence of external and internal noises on the performance of communication systems</p> <p style="color: blue; margin: 10px 0 0 0;">COURSE OUTCOMES:</p> <p style="margin: 0;">Upon the successful completion of this course, students will be able to:</p> <p>CO 1 Interpret the basic concepts, need of modulation and fundamental elements to introduce analog communication systems.</p> <p>CO 2 Outline fundamental signals, Multiplexing, spectrum and basic communication system for analog signal transmission.</p> <p>CO 3 Describe the basic principles, generation and detection techniques of amplitude modulation used in broadcasting systems</p> <p>CO 4 Interpret the generation and detection techniques of frequency modulated waves used for audio signal transmission systems.</p> <p>CO 5 Calculate bandwidth, power requirements, efficiency and noise to compare AM and FM analog communication systems</p> <p>CO 6 Compare the effect of external and internal noises to measure the performance of analog communication systems.</p> <p>CO 7 Interpret signal to noise ratio (SNR) and noise figure for analysis of amplitude and frequency modulation techniques.</p> <p>CO 8 Outline the basic concepts, fundamental elements of Pulse Modulation techniques to introduce pulse communication systems.</p> <p>CO 9 Illustrate the generation and detection of pulse modulation techniques for digital communication systems.</p> <p>CO 10 Compare the working principles and operations of receivers for short wave communication systems.</p> <p>CO 11 Distinguish AM and FM receivers to measure selectivity, sensitivity, fidelity and SNR.</p> <p>CO 12 Apply basic principles of analog communication systems for real time applications of radio and TV communications</p>								
MODULE-I	AMPLITUDE MODULATION						Classes: 09	
<p>Introduction to communication system, Need for modulation, Frequency Division Multiplexing , Amplitude Modulation, Definition, Time domain and frequency domain description, single tone modulation, power relations in AM waves, Generation of AM waves, square law Modulator, Switching modulator, Detection of AM Waves; Square law detector, Envelope detector, Double side band suppressed carrier modulators, time domain and frequency domain description, Generation of DSBSC Waves, Balanced Modulators, Ring Modulator, Coherent detection of DSB-SC Modulated waves, COSTAS Loop.</p>								

MODULE-II	SSB MODULATION	Classes-09
SSB Modulation: Frequency domain description, Frequency discrimination method for generation of AM SSB Modulated Wave, Time domain description, Phase discrimination method for generating AM SSB Modulated waves. Demodulation of SSB Waves, Vestigial side band modulation: Frequency description, Generation of VSB Modulated wave, Time domain description, Envelop detection of a VSB Wave pulse Carrier, Comparison of AM Techniques, Applications of different AM Systems.		
MODULE-III	ANGLE MODULATION	Classes-09
Basic concepts, Frequency Modulation: Single tone frequency modulation, Spectrum Analysis of Sinusoidal FM Wave, Narrow band FM, Wide band FM, Constant Average Power. Transmission bandwidth of FM Wave - Generation of FM Waves, Direct FM, Detection of FM Waves: Balanced Frequency discriminator, Zero crossing detector, Phase locked loop, Comparison of FM and AM.		
MODULE-IV	NOISE IN ANALOG COMMUNICATION SYSTEM	Classes-09
Types of Noise: Resistive (Thermal) Noise Source, Shot noise, Extraterrestrial Noise, Arbitrary Noise Sources, White Noise, Narrowband Noise- In phase and quadrature phase components and its Properties, Modeling of Noise Sources, Average Noise Bandwidth, Effective Noise Temperature, Average Noise Figures, Average Noise Figure of cascaded networks. Noise in DSB and SSB System Noise in AM System, Noise in Angle Modulation System, Noise Triangle in Angle Modulation System, Pre-emphasis and de-emphasis.		
MODULE-V	RECEIVERS	Classes-09
Receiver Types -Tuned radio frequency receiver, Superhetrodyne receiver, RF section and Characteristics - Frequency changing and tracking, Intermediate frequency, AGC, FM Receiver, Comparison with AM Receiver, Amplitude limiting. Pulse Modulation: Types of Pulse modulation, PAM (Single polarity, double polarity) PWM: Generation and demodulation of PWM, PPM, Generation and demodulation of PPM, Time Division Multiplexing.		
Text Books:		
1. S. S. Haykin, "Communication Systems", Wiley Eastern, 2 nd Edition, 2006. 2. Taub, Schilling, "Principles of Communication Systems", Tata McGraw-Hill, 4 th Edition, 2013.		
Reference Books:		
1. B.P. Lathi, "Communication Systems, BS Publication", 2 nd Edition, 2006. 2. John G. Proakis, Masond, Salehi, "Fundamentals of Communication Systems", PEA, 1 st Edition, 2006 3. George Kennedy, Bernard Davis, "Electronics and Communication System", Tata McGraw Hill, 5 th Edition, 2011.		
Web References:		
1. http://www.web.eecs.utk.edu 2. https://everythingvtu.wordpress.com 3. http://nptel.ac.in/ 4. http://www.iare.ac.in		
E-Text Books:		
1. http://www.bookboon.com/ 2. http://www.jntubook.com 3. http://www.smartzworld.com 4. http://www.archive.org		