



Sardar Patel Institute of Technology

Bhavan's Campus, Munshi Nagar, Andheri (West), Mumbai-400058-India
(Autonomous Institute Affiliated to University of Mumbai)

Course Code	Course Name	Teaching Scheme (Hrs/week)			Credits Assigned			
		L	T	P	L	T	P	Total
EL44	Fundamentals of Communication Engineering	03	--	--	03	--	--	03
		Examination Scheme						
		ISE		MSE		ESE		
		10		30		100 (60% Weightage)		

Pre-requisite Course Codes		EL31 (Analog Electronics - I) EL32 (Circuit Theory)
After successful completion of the course, student will be able to		
Course Outcomes	CO1	Infer principle of working of various sub systems of analog communication
	CO2	Analyze the performance parameters of analog and pulse modulations
	CO3	Apply concepts of Signals and systems to Analog Communication
	CO4	Analyze principle of working of receivers.
	CO5	Characterize noise and interpret effect of noise on modulations
	CO6	Compare the different analog communication systems.

Module No.	Unit No.	Topics	Ref.	Hrs.
1	1.1	Amplitude Modulation Introduction to communication system, Need for modulation, Amplitude Modulation, Definition, Time domain and frequency domain description, power relations in AM waves, Generation of AM waves, square law Modulator, Types of modulators. DSB-SC, time domain and frequency domain description, Generation of DSB-SC Modulated waves, Frequency Division Multiplexing Detection of AM Waves: Square law detector, Envelop detector	1,2	06
	1.2	Single Side Band (SSB):-Principle, Filter method, phase shift method and third method Independent side band (ISB) and Vestigial Side Band (VSB) principles and transmitters	1,2	04
	1.3	Comparison and Applications of different AM Systems	1,2	01
	2.1	Angle Modulation Frequency modulation (FM): Basic concepts, Mathematical analysis of FM, Time and frequency domain representation, FM generation methods-Varactor diode modulator, FET reactance	1,2	06



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		modulator, Direct FM transmitter, Indirect FM Transmitter		
	2.2	FM demodulation: Balance slope detector, Foster-Seely discriminator, ratio detector, Phase lock loop(PLL) FM demodulator	1,2	03
	2.3	Comparison of AM, FM , Applications of FM	1,2	01
3	3.1	Noise Resistive (Thermal) Noise Source, White Noise, Narrowband Noise-In phase and quadrature phase components and its Properties, noise figure, and noise temperature, Noise Figure of cascaded networks.	1,2	06
	3.2	Effect of noise on AM and FM, Pre Emphasis and De-Emphasis	1	01
4	4.1	Radio Receivers Types of receivers, TRF, Super heterodyne receiver, AM and FM receivers	1,3	04
	4.2	Receiver parameters, and choice of IF, Simple AGC, delayed AGC	1,3	04
5	5.1	Pulse Modulation Review of Sampling theory, Generation Detection and applications: PAM, PWM, PPM	1,5	03
	5.2	Generation, Detection and applications : PCM, Delta modulation, adaptive delta modulation, TDM	1,2	03
Total			42	

References:

- [1] Wayne Tomasi "Electronics communication systems" Pearson education, Third edition.
- [2] Taub and Schilling "Principles of communication systems", Tata McGraw Hill, Third Edition.
- [3] Kennedy and Davis "Electronics communication system", Tata McGraw Hill, Fifth Edition.
- [4] B.P. Lathi "Modern Digital and analog Communication system" OXFORD, Third edition.
- [5] R.P. Sing and S.D. Sapre, "Communication systems Analog and Digital ", Tata McGraw Hill, Fifth Edition.
- [6] Simon Haykin, Michel Moher, "Introduction to Analog and Digital Communication", Wiley, Second edition.
- [7] Dennis Roddy and John Coolen, "Electronic Communication", Prentice Hall, Third Edition.