

Siruseri IT park, OMR, Chennai - 603103

LESSON PLAN							
Department of Electronics and Communication Engineering							
Name of the Subject	Communication Theory	Name of the handling Faculty	JAYANTHIE				
Subject Code	EC8491	Year / Sem	II/IV				
Acad Year	2021-2022	Batch	2020-2024				
Course Objective							
To Introduce the concepts of Various analog modulations and their spectral characteristics							
To understand the properties of random process							
To know the effect of noise on communication systems							
To know the principles of sampling and quantization							
Course Outcome							
Design AM Communication systems							
Design Angle modulated communication systems							
Apply the concepts of Random Process to the design of Communication systems							
Analyze the noise performanace of AM and FM systems							
Gain knowledge in sampling and quantization							
Lesson Plan							
Sl. No.	Topic(s)	T / R*	Periods Required	Mode of Teaching (BB / PPT / NPTEL / MOOC / etc)	Blooms Level L6)	(L1- CO	PO
		Book					
UNIT I-AMPLITUDE MODULATION							
1	Amplitude Modulation-DSBFC, DSBSC-Modulation index ,Spectra ,Power relations and Bandwidth	T1	1	BB	L4	CO1	PO1, PO2,PO3, PO5, PO12
2	SSB ,VSB	T1	1	BB	L4	CO1	PO1, PO2,PO3, PO5, PO12
3	AM Generation-Square law and Switching modulator	T1	1	BB	L4	CO1	PO1,PO2,PO3,PO5
4	DSBSC Generation-Balanced and Ring Modulator	T1	1	BB	L4	CO1	PO1,PO2,PO3,PO5
5	SSB Generation-Filter,Phase Shift and Third methods	T1	1	BB	L4	CO1	PO1,PO2,PO3,PO5
6	VSB Generation-Filter method	T1	1	BB	L3	CO1	PO1,PO2,PO3,PO5
7	Hilbert Transform,Pre-envelope and complex envelope	T1	1	BB	L4	CO1	PO1,PO2,PO3
8	Comparison of different AM techniques	T1	1	BB	L2	CO1	PO1
9	Superhetrodyne Receiver	T1	1	BB	L3	CO1	PO1,PO2,PO3,PO4,PO5,PO12
Suggested Activity: Assignment / Case Studies / Tutorials/ Quiz / Mini Projects / Model Developed/others Planned if any							
TUTORIALS							
Evaluation method :MARKS WILL BE GIVEN FOR CORRECT ANSWERS							
UNIT II-ANGLE MODULATION							
10	Phase and Frequency Modulation	T1	1	BB	L4	CO2	PO1,PO2,PO3
11	Narrow Band FM-Modulation index,Spectra power relations and Transmission bandwidth	T1	1	BB	L4	CO2	PO1,PO2,PO3
12	WideBand FM-Modulation index,Spectra power relations and Transmission bandwidth	T1	1	BB	L4	CO2	PO1,PO2,PO3
13	FM modulation -Direct methods	T1	1	BB	L3	CO2	PO1,PO2,PO3,PO5
14	Indirect methods	T1	1	BB	L3	CO2	PO1,PO2,PO3,PO5
15	FM demodulation	T1	1	BB	L3	CO2	PO1,PO2,PO3
16	FM to AM conversion	T1	1	BB	L2	CO2	PO1,PO2
17	FM Discriminator	T1	1	BB	L3	CO2	PO1,PO2,PO3
18	PLL as FM Demodulator	T1	1	BB	L3	CO2	PO1,PO2,PO3
Suggested Activity: Assignment / Case Studies / Tutorials/ Quiz / Mini Projects / Model Developed/others Planned if any							
MINI PROJECT							

Evaluation method :BASED ON THE OUTPUT AND PRESENTATION							
UNIT III-RANDOM PROCESS							
19	Random Variables	T1	1	BB	L4	CO3	PO1,PO2,PO3,PO4
20	Random Process	T1	1	BB	L4	CO3	PO1,PO2,PO3,PO4
21	Stationary Process	T1	1	BB	L4	CO3	PO1,PO2,PO3,PO4
22	Mean ,Coorelation and Covariance functions	T1	1	BB	L4	CO3	PO1,PO2,PO3,PO4
23	Power Spectral density	T1	1	BB	L4	CO3	PO1,PO2,PO3,PO4
24	Ergodic Processes	T1	1	BB	L4	CO3	PO1,PO2,PO3,PO4
25	Gaussian Process	T1	1	BB	L4	CO3	PO1,PO2,PO3,PO4
26	Transmission of a Random Process Through a LTI filter	T1	1	BB	L3	CO3	PO1,PO2,PO3,PO4
27	Problems	T1	1	BB	L4	CO3	PO1,PO2,PO3
Suggested Activity: Assignment / Case Studies / Tutorials/ Quiz / Mini Projects / Model Developed/others Planned if any ASSIGNMENTS AND GROUP DISCUSSIONS							
Evaluation method :BASED THE CONTENT SUBMISSION, MARKS WILL BE AWARDED.							
UNIT IV-NOISE CHARACTERIZATION							
28	Noise Sources	T1	1	BB	L2	CO4	PO1,PO2,PO3
29	Noise Figure	T1	1	BB	L3	CO4	PO1,PO2,PO3
30	Noise Temperature and Noise bandwidth	T1	1	BB	L2	CO4	PO1,PO2,PO3
31	Noise in cascaded systems	T1	1	BB	L3	CO4	PO1,PO2,PO3
32	Representation of Narrow band noise -In phase and quadrature	T1	1	BB	L4	CO4	PO1,PO2,PO3
33	Representation of Narrow band noise -Envelope and phase	T1	1	BB	L4	CO4	PO1,PO2,PO3
34	Noise Performance analysis in AM systems	T1	1	BB	L4	CO4	PO1,PO2,PO3,PO4
35	Noise Performance analysis in FM systems-Threshold effect	T1	1	BB	L4	CO4	PO1,PO2,PO3,PO4
36	Pre-emphasis and De-emphasis for FM	T1	1	BB	L3	CO4	PO1,PO2,PO3,PO4,PO5
Suggested Activity: Assignment / Case Studies / Tutorials/ Quiz / Mini Projects / Model Developed/others Planned if any QUIZ							
Evaluation method :GOOGLE FORM							
UNIT V-SAMPLING AND QUANTIZATION							
37	Low pass Sampling	T2	1	BB	L2	CO5	PO1,PO2,PO3
38	Aliasing	T2	1	BB	L2	CO5	PO1,PO2,PO3
39	Signal Reconstruction	T2	1	BB	L1	CO5	PO1,PO2,PO3
40	Quantization-Uniform and Non-Uniform Quantization	T2	1	BB	L2	CO5	PO1,PO2,PO3
41	Quantization Noise,Logarithmic Companding	T2	1	BB	L2	CO5	PO1,PO2,PO3
42	PAM,PPM,PWM	T2	1	BB	L3	CO5	PO1,PO2,PO3,PO4,PO5,PO12
43	PCM	T2	1	BB	L3	CO5	PO1,PO2,PO3,PO4,PO5,PO12
44	TDM	T2	1	BB	L3	CO5	PO1,PO2,PO3
45	FDM	T2	1	BB	L3	CO5	PO1,PO2,PO3
Suggested Activity: Assignment / Case Studies / Tutorials/ Quiz / Mini Projects / Model Developed/others Planned if any Case Study							
Evaluation method :BASED THE CONTENT SUBMISSION, MARKS WILL BE AWARDED.							
Content Beyond the Syllabus Planned							
1	Types of Sampling						

2	Applications Of Pulse Code Modulation													
Text Books														
1	J.G Proakis,M.Salehi,"Fundamentals of Communication Systems",Pearson Education 2014,(UNIT I-IV)													
2	Simon Haykin,"Communication Systems",4th Edition,Wiley ,2014(UNIT I-V)													
Reference Books														
1	B.P.Lathi,"Modern Digital and Analog Communication Systems",3rd Edition,Oxford University Press,2007													
2	D.Roody ,J.Coolan -Electronic Communications,4th edition PHI 2006													
3	A.Papoulis , "Probability,Random variables and Stochastic Processes",McGraw Hil,3rd edition,1991													
4	B.Sklar,"Digital Commuications Fundamentals and Applications ",2nd Edition Pearson Education 2007.													
5	H.P Hsu,Schaum Outline Series-"Analog and Digital Communications"TMH 2006													
6	Couch.L,"Modern Communication Systems",Pearson 2001													
Website / URL References														
1	https://onlinecourses.nptel.ac.in/noc19_ee46/preview													
2	https://youtube/WUCMavXbJo4													
3	https://www.elprocus.com/pulse-code-modulation-and-demodulation													
Blooms Level														
Level 1 (L1) : Remembering			Lower Order Thinking	Fixed Hour Exams	Level 4 (L4) : Analysing				Higher Order Thinking	Projects / Mini Projects				
Level 2 (L2) : Understanding					Level 5 (L5) : Evaluating									
Level 3 (L3) : Applying					Level 6 (L6) : Creating									
Mapping syllabus with Bloom's Taxonomy LOT and HOT														
Unit No	Unit Name				L1	L2	L3	L4	L5	L6	LOT	HOT	Total	
Unit 1	AMPLITUDE MODULATION				0	1	2	6	0	0	3	6	9	
Unit 2	ANGLE MODULATION				0	1	5	3	0	0	6	3	9	
Unit 3	RANDOM PROCESS				0	0	1	8	0	0	1	8	9	
Unit 4	NOISE CHARACTERIZATION				0	2	3	4	0	0	5	4	9	
Unit 5	SAMPLING AND QUANTIZATION				1	4	4	0	0	0	9	0	9	
Total					1	8	15	21	0	0	24	21	45	
Total Percentage					2.22222	17.7778	33.3333	46.6667	0	0	53.3333	46.6667	100	
CO PO Mapping														
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	2	2	3	1					1	2	2	1
CO2	3	3	2	2	3	1					1	2	2	1
CO3	3	3	2	2	1	1					1	1	2	1
CO4	3	1	2	1	1	1	2				1	1	2	1
CO5	3	2	2	2	2	1					1	2	2	1
Avg	3	2	2	2	2	1	0				1	2	2	1
Justification for CO-PO mapping														
CO1	PO1(3) Graduates will be learn the basic knowledge of Amplitude modulation systems,PO2(2) Graduates will able to analyze the problems in the field of AM systems,PO12(2),Graduates will be able to upgrades their knowledge in Amplitude receiver by life long learning													
CO2	PO1(3) Graduates will be learn the basic knowledge of Angle modulation systems,PO2(2) Graduates will able to analyze the problems in the field of Frequency modulation systems,PO5(3),Graduates will be able to use modern tools usage in Frequency generation and detection													
CO3	PO2(3) Graduates will be able analyse the random process in communication systems. PO6(1) Graduates will able to slightly gain the contextual knowledge.PO11(1) Graduates will be able to discuss about random process and variables.													
CO4	PO4(1) Graduates will be able investigate at research level about noises in communication systems.PO7(2) Graduates will be able to understand the signal to noise ration in all type of modulation systems													
CO5	PO2(2) Graduates will be able analyse the Sampling and Quantization in communication systems. PO3(2) Graduates will able to design the pulse modulation systems.PO5(2) Graduates will be able to use recent tools in pulse code modulation systems.													
3	High level				2		Moderate level			1		Low level		
Name & Sign of Faculty Incharge :JAYANTHI.E,ASSISTANT PROFESSOR														
Name & Sign of Subject Expert :														
Head of the Department :														