B. P. Poddar Institute of Management & Technology

Department of Electronics & Communication Engineering

Academic Year: 2024-25

Lesson Plan

Course Name: Analog Communication **Course Code: EC 401**

S. No.	Lecture/ Tutorial No.	Topics to be Covered	Text/ References	Teaching Pedagogy*
1.	L1	Familiarization of students with Institute and Department Vision, Mission, PEOs, POs, PSOs, COs and Course Overview		C&T, PPT, CD
2.	L2	Need of modulation and demodulation in a communication system, elements of communication systems	T1, R1	C&T, PPT, CD
3.	L3	Time domain and frequency domain representations and phasor diagram of AM-DSB-TC	T1, T2, T3, WR1	C&T, PPT, CD
4.	T1	Calculation of the amplitude modulation index	R1	C&T, PPT, CD, PS
5.	T2	Calculation of the transmitted power, sideband power and efficiency for AM-DSB-TC	R1	C&T, PPT, CD, Q, PS
6.	L4	Time domain and frequency domain representation of DSBSC	T1, T2, WR1	C&T, PPT, CD
7.	L5	Time domain and frequency domain representation of SSB-TC and SSB-SC	T1, T2, WR1	C&T, PPT, CD
8.	L6	Concept of VSB	T1, T2, T3, WR1	C&T, PPT, CD
9.	T3	Problems on amplitude modulation	R1	C&T, PPT, CD, Q, PS
10.	L7	AM signal generation using gated and square law modulators	T1, T2	C&T, PPT, CD
11.	L8	Comparison of balanced modulator for generation of AM signal with gated and square law modulators	T1, T2	C&T, PPT, CD
12.	L9	SSB generation using filter method and phase shift method	T1, T2, T3	C&T, PPT, CD
13.	L10	Comparison of the third method for generation of SSB signal with filter method and phase shift method	T1, T2	C&T, PPT, CD
14.	L11	Demodulation of AM signal using envelope detector and synchronous detection for AM-SC signals	T1, T2, T3	C&T, PPT, CD

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15.	T4	Problems on amplitude demodulation	R1	C&T, PPT, CD, PS
16.	L12	Time domain representation of FM and PM signals for a single tone message	T1, T2, T3, WR1	C&T, PPT, CD
17.	T5	Calculation of sensitivity, modulation index, phase and frequency deviation, carrier swing and power dissipation	R1	C&T, PPT, CD, PS
18.	L13	Phasor diagram and spectrum of NBFM and WBFM	T1, T2, T3, WR1	C&T, PPT, CD
19.	T6	Computation of the bandwidth for angle modulation techniques	R1	C&T, PPT, CD, PS
20.	L14	Generation of angle modulated signals, concept of VCO and reactance modulator	T1, T3, R1	C&T, PPT, CD
21.	L15	Comparison of Armstrong method for FM signal generation with direct method	T1, R1	C&T, PPT, CD
22.	L16	Demodulation technique using frequency discriminator	T1, T2, T3	C&T, PPT, CD
23.	L17	Demodulation techniques using PLL with frequency discriminator	T1, T2, T3	C&T, PPT, CD
24.	L18	Principle of AM and FM superheterodyne receivers	R1	C&T, CD
25.	T7	Calculation of the intermediate frequency, image frequency and rejection ratio for a superheterodyne receiver	R1	C&T, CD, PS
26.	L19	Compare FDM and TDM	R1	C&T, PPT, CD
27.	L20	Basic concepts of stereo AM and FM	T1, R1	C&T, PPT, CD
28.	L21	Concept of probability, conditional probability, and total probability	R2, WR1	FC, C&T, PPT, CD
29.	L22	PMF, CDF, PDF, expectation, variance, and standard deviation	R1, R2, WR1	FC, C&T, PPT, CD
30.	L23	Distribution functions	R1, R2, WR1	C&T, PPT, CD
31.	T8	Applications of probability and statistics in communication system	R1, R2	C&T, PPT, CD, PS
32.	L24	Internal and external noise in a communication system	R1, R2, WR1	C&T, PPT, CD
33.	T9	Calculation of noise temperature, signal-to-noise ratio and figure of merit	R1	C&T, PPT, CD, PS

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34.	T10	Comparison of the performance of DSB-TC, DSBSC and SSB modulation in terms of SNR	R1, WR1	C&T, PPT, CD, PS
35.	T11	Comparison of the performance of AM and FM in terms of SNR	R1	C&T, PPT, CD, PS
36.	L25	Discussions on a recent publication on Analog Communication	RP1	C&T, CD
37.	L26	Discussions on previous year questions and model questions		C&T, CD, Q, PS

Text Books (T):

1. S. Haykin, Simon Haykin, 4th ed., Wiley
2. H. Taub, D. L. Schilling and G. Saha, Principles of Communication Systems, 3rd ed., Tata Mc-Graw Hill
3. B. P. Lathi and Z. Ding, Modern Digital and Analog Communication Systems, 4th ed., Oxford

Reference Books (R):

1. S. Sharma, Analog Communication Systems, 6th ed., Katson Books
2. A. Saha, N. Manna and S. Mandal, Information Theory, Coding and Cryptography, Pearson

Web Resource (WR):

1. https://nptel.ac.in/courses/117105143

Research Paper (RP):

1. L. Huang, Y. Chen and H. Huang, "Research of Analog Communication System," *2021 IEEE International Conference on Artificial Intelligence and Computer Applications (ICAICA)*, Dalian, China, 2021, pp. 463-465, doi: 10.1109/ICAICA52286.2021.9498079

***Teaching Pedagogy:**

S. No.	Abbreviation	Full Form
1.	C&T	Chalk & Talk
2.	PPT	Power Point Presentation
3.	CD	Classroom Discussions
4.	Q	Quiz
5.	PS	Problem Solving
6.	FC	Flipped Class

Assessment Methodology:

S. No.	Assessment Type	CO Covered
1.	Presentation	CO1
2.	Report Writing	CO2
3.	Class Test1	CO1, CO2, CO3
4.	Class Test2	CO4, CO5
5.	Quiz	CO1, CO2, CO3, CO4, CO5
6.	Assignment	CO1, CO2, CO3, CO4, CO5
7.	End Semester University Exam	CO1, CO2, CO3, CO4, CO5
8.	End Semester Students' Survey (CO Learning Assessment)	CO1, CO2, CO3, CO4, CO5

Dr. Surajit Mandal