NILASAILA INSTITUTE OF SCIENCE & TECHNOLOGY
SERGARH-756060, BALASORE (ODISHA)
(Approved by AICTE& affiliated to SCTE&VT, Odisha)

LESSON PLAN

SUBJECT: TH-3 (ANALOG & DIGITAL COMMUNICATION)

Name Of The Faculty :- Er.CHIRANJIB SEN
Branch :- ELECTRICAL AND ELECTRONIC ENGINEERING   **Semester :- 5th**
Academic Year : 2025-26   **Examination :-** 2025 (W)

CHAPTER WISE DISTRIBUTION OF PERIODS

Sl.No.	Name of the chapter as per the Syllabus	No. of Periods as per the Syllabus	No. of periods actually needed
1	ELEMENTS OF COMMUNICATION SYSTEMS	10	10
2	AMPLITUDE (LINEAR)	15	15
3	ANGLE MODULATION SYSTEMS	10	10
4	AM & FM TRANSMITTER &	8	8
5	ANALOG TO DIGITAL CONVERSION	17	17
6	DIGITALMODULATION	15	16
TOTAL PERIOD		75	75

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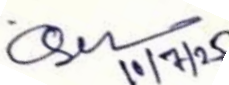| Name of the programme:Diploma In ELECTRICAL AND ELECTRONIC ENGINEERING	Semester: 5th	Name of the Teaching Faculty: Er.Chiranjib Sen	
		Academic Year : 2025-26 Examination : 2025 (W)	
Course Code: TH-3	Course Year: Third Year	No. of Classes Alloted Per Week :	5
		Planned Classes Required to Complete the Course	75
Week	Class Day	Topics to be Covered	
1st	1st	**Unit-1: Elements of Communication Systems.** 1.1 Communication Process- Concept of Elements of Communication System & its Block diagram	
	2nd	1.1 Communication Process- Concept of Elements of Communication System & its Block diagram	
	3rd	1.1 Communication Process- Concept of Elements of Communication System & its Block diagram	
	4th	1.2 Source of information & Communication Channels	
	5th	1.3 Classification of Communication systems (Line & Wireless or Radio)	
2nd	1st	1.4 Modulation Process, Need of modulation and classify modulation process	
	2nd	1.5 Analog and Digital Signals & its conversion.	
	3rd	1.6 Basic concept of Signals & Signals classification (Analog and Digital)	
	4th	1.6 Basic concept of Signals & Signals classification (Analog and Digital)	
	5th	1.7 Bandwidth limitation	
3rd	1st	**Unit-2: Amplitude (linear) Modulation System** 2.1 Amplitude modulation & derive the expression for amplitude modulation signal, power relation in AM wave & find Modulation Index.	
	2nd	2.1 Amplitude modulation & derive the expression for amplitude modulation signal, power relation in AM wave & find Modulation Index.	

Week	Class Day	Topics to be Covered
3rd	3rd	2.1 Amplitude modulation & derive the expression for amplitude modulation signal, power relation in AM wave & find Modulation Index.
	4th	2.2 Generation of Amplitude Modulation(AM)- Linear level AM modulation only
	5th	2.2 Generation of Amplitude Modulation(AM)- Linear level AM modulation only
4th	1st	2.3 Demodulation of AM waves (liner diode detector, square law detector & PLL)
	2nd	2.3 Demodulation of AM waves (liner diode detector, square law detector & PLL)
	3rd	2.4 Explain SSB signal and DSBSC signal
	4th	2.5 Methods of generating & detection SSB-SC signal (Indirect method only)
	5th	2.5 Methods of generating & detection SSB-SC signal (Indirect method only)
5th	1st	2.6 Methods of generation DSB-SC signal (Ring Modulator) and detection of DSB-SC signal (Synchronous detection)
	2nd	2.6 Methods of generation DSB-SC signal (Ring Modulator) and detection of DSB-SC signal (Synchronous detection)
	3rd	2.6 Methods of generation DSB-SC signal (Ring Modulator) and detection of DSB-SC signal (Synchronous detection)
	4th	2.7 Concept of Balanced modulators
	5th	2.8 Vestigial Side Band Modulation
6th	1st	**Unit-3: Angle Modulation Systems.** 3.1 Concept of Angle modulation & its types (PM & FM)
	2nd	3.2 Basic principle of Frequency Modulation & Frequency Spectrum of FM Signal.
	3rd	3.3 Expression for Frequency Modulated Signal & Modulation Index and sideband of FM signal

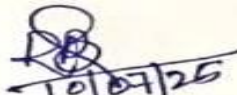| Week	Class Day	Topics to be Covered
6th	4th	3.4 Explain Phase modulation & difference of FM & PM)- working principle with Block Diagram
	5th	3.4 Explain Phase modulation & difference of FM & PM)- working principle with Block Diagram
7th	1st	3.5 Compare between AM and FM modulation (Advantages & Disadvantages)
	2nd	3.6 Methods of FM Generation (Indirect (Armstrong) method only) working principle with Block Diagram
	3rd	3.6 Methods of FM Generation (Indirect (Armstrong) method only) working principle with Block Diagram
	4th	3.7 Methods of FM Demodulator or detector (Forster-Seely & Ratio detector)- working principle with Block Diagram
	5th	3.7 Methods of FM Demodulator or detector (Forster-Seely & Ratio detector)- working principle with Block Diagram
8th	1st	**Unit-4: AM & FM TRANSMITTER & RECEIVER** 4.1 Classification of Radio Receivers
	2nd	4.2 Define the terms Selectivity, Sensitivity, Fidelity and Noise Figure
	3rd	4.3 AM transmitter - working principle with Block Diagram
	4th	4.3 AM transmitter - working principle with Block Diagram
	5th	4.4 Concept of Frequency conversion, RF amplifier & IF amplifier ,Tuning, S/N ratio
9th	1st	4.5 Working of super heterodyne radio receiver with Block diagram
	2nd	4.6 Working of FM Transmitter & Receiver with Block Diagram
	3rd	4.6 Working of FM Transmitter & Receiver with Block Diagram
	4th	**Unit-5: ANALOG TO DIGITAL CONVERSION & PULSE MODULATION SYSTEM**. 5.1 Concept of Sampling Theorem , Nyquist rate & Aliasing

Week	Class Day	Topics to be Covered
9th	5th	5.2 Sampling Techniques (Instantaneous, Natural, Flat Top)
10th	1st	5.3 Analog Pulse Modulation - Generation and detection of PAM, PWM & PPM system with the help of Block diagram & comparison of all above
	2nd	5.3 Analog Pulse Modulation - Generation and detection of PAM, PWM & PPM system with the help of Block diagram & comparison of all above
	3rd	5.4 Concept of Quantization of signal & Quantization error.
	4th	5.5 Generation & Demodulation of PCM system with Block diagram & its application
	5th	5.5 Generation & Demodulation of PCM system with Block diagram & its application
11th	1st	5.6 Companding in PCM & Vocoder
	2nd	5.7 Time Division Multiplexing & explain the operation with circuit diagram
	3rd	5.7 Time Division Multiplexing & explain the operation with circuit diagram
	4th	5.8 Generation & demodulation of Delta modulation with Block diagram.
	5th	5.8 Generation & demodulation of Delta modulation with Block diagram.
12th	1st	5.8 Generation & demodulation of Delta modulation with Block diagram.
	2nd	5.9 Generation & demodulation of DPCM with Block diagram
	3rd	5.9 Generation & demodulation of DPCM with Block diagram
	4th	5.9 Generation & demodulation of DPCM with Block diagram

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12th	5th	5.10 Comparison between PCM, DM , ADM & DPCM
13th	1st	**Unit-6: DIGITALMODULATION TECHNIQUES.** 6.1 Concept of Multiplexing (FDM & TDM)- (Basic concept , Transmitter & Receiver) & Digital modulation formats.
	2nd	6.2 Advantages of digital communication system over Analog system
	3rd	6.3 Digital modulation techniques & types.
	4th	6.3 Digital modulation techniques & types.
	5th	6.4 Generation and Detection of binary ASK, FSK, PSK, QPSK,QAM, MSK, GMSK.
14th	1st	6.4 Generation and Detection of binary ASK, FSK, PSK, QPSK,QAM, MSK, GMSK.
	2nd	6.4 Generation and Detection of binary ASK, FSK, PSK, QPSK,QAM, MSK, GMSK.
	3rd	6.5 Working of T1-Carrier system
	4th	6.5 Working of T1-Carrier system
	5th	6.6 Spread Spectrum & its applications
15th	1st	6.7 Working operation of Spread Spectrum ModulationTechniques (DS-SS & FH-SS).
	2nd	6.7 Working operation of Spread Spectrum ModulationTechniques (DS-SS & FH-SS).
	3rd	6.8 Define bit, Baud, symbol & channel capacityformula.(Shannon Theorems)
	4th	6.9 Application of Different Modulation Schemes
	5th	6.10 Types of Modem & its Application

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