

Discipline: ELECTRONICS and Telecommunication Engineering SEMESTER: 5 TH		Name of the Teaching Faculty: Er. NIRMALA NANDA DHAL
Subject: - TH – 3 ANALOG & DIGITAL COMMUNICATION	No. of days per week class allotted: 05	Semester From Date: 15.09.2022 To 22.12.2022 No. of Weeks: 15
Week	Class Day	Theory Topics
1st	Unit-1: Elements of Communication Systems.	
	1 st	1.1 Communication Process- Concept of Elements of Communication System & its Block diagram
	2 nd	1.1 Communication Process- Concept of Elements of Communication System & its Block diagram
	3 rd	1.2 Source of information & Communication Channels.
	4 th	1.3 Classification of Communication systems (Line)
	5 th	1.3 Classification of Communication systems (Wireless or Radio)
2nd	1 st	1.4 Modulation Process, Need of modulation
	2 nd	1.4 Need of modulation and classify modulation process
	3 rd	1.5 Analog and Digital Signals & its conversion.
	4 th	1.6 Basic concept of Signals & Signals classification (Analog & Digital)
	5 th	1.7 Bandwidth limitation
3rd	Unit-2: Amplitude (linear) Modulation System	
	1 st	2.1 Amplitude modulation & derive the expression for amplitude modulation signal, power relation in AM wave & find Modulation Index.
	2 nd	2.1 Amplitude modulation & derive the expression for amplitude modulation signal, power relation in AM wave & find Modulation Index.

	3 rd	2.1 Amplitude modulation & derive the expression for amplitude modulation signal, power relation in AM wave & find Modulation Index.
	4 th	2.2 Generation of Amplitude Modulation (AM)- Linear level AM modulation only
	5 th	2.3 Demodulation of AM wave (liner diode detector, square law detector)
4 th	1 st	2.3 Demodulation of AM wave (Square law detector & PLL)
	2 nd	2.4 Explain SSB signal and DSBSC signal
	3 rd	2.5 Methods of generating & detection SSB-SC signal (Indirect method only)
	4 th	2.6 Methods of generation DSB-SC signal (Ring Modulator) and detection of DSB-SC signal (Synchronous detection)
	5 th	2.6 Methods of generation DSB-SC signal (Ring Modulator) and detection of DSB-SC signal (Synchronous detection)
5 th	1 st	2.6 Methods of generation DSB-SC signal (Ring Modulator) and detection of DSB-SC signal (Synchronous detection)
	2 nd	2.7 Concept of Balanced modulators
	3 rd	2.7 Concept of Balanced modulators
	4 th	2.8 Vestigial Side Band Modulation
	5 th	2.8 Vestigial Side Band Modulation
6 th	Unit-3: Angle Modulation Systems.	
	1 st	3.1 Concept of Angle modulation & its types (PM & FM)
	2 nd	3.1 Concept of Angle modulation & its types (PM & FM)
	3 rd	3.2 Basic principle of Frequency Modulation & Frequency Spectrum of FM Signal.
	4 th	3.3 Expression for Frequency Modulated Signal & Modulation Index and sideband of FM signal
	5 th	3.4 Explain Phase modulation & difference of FM & PM)- working principle with Block Diagram

7th	1 st	3.5 Compare between AM and FM modulation (Advantages & Disadvantages)
	2 nd	3.6 Methods of FM Generation (Indirect (Armstrong) method only) working principle with Block Diagram
	3 rd	3.6 Methods of FM Generation (Indirect (Armstrong) method only) working principle with Block Diagram
	4 th	3.7 Methods of FM Demodulator or detector (Forster-Seely & Ratio detector)- working principle with Block Diagram
	5 th	3.7 Methods of FM Demodulator or detector (Forster-Seely & Ratio detector)- working principle with Block Diagram
8th	Unit-4: AM & FM TRANSMITTER & RECEIVER	
	1 st	4.1 Classification of Radio Receivers
	2 nd	4.2 Define the terms Selectivity, Sensitivity, Fidelity and Noise Figure
	3 rd	4.3 AM transmitter - working principle with Block Diagram
	4 th	4.4 Concept of Frequency conversion, RF amplifier & IF amplifier ,Tuning, S/N ratio
	5 th	4.5 Working of super heterodyne radio receiver with Block diagram
9th	1 st	4.5 Working of super heterodyne radio receiver with Block diagram
	2 nd	4.6 Working of FM Transmitter & Receiver with Block Diagram.
	3 rd	4.6 Working of FM Transmitter & Receiver with Block Diagram.
	Unit-5: Analog To Digital Conversion & Pulse Modulation System.	
	4 th	5.1 Concept of Sampling Theorem , Nyquist rate & Aliasing
	5 th	5.1 Concept of Sampling Theorem , Nyquist rate & Aliasing
10th	1 st	5.2 Sampling Techniques (Instantaneous, Natural, Flat Top)
	2 nd	5.3 Analog Pulse Modulation - Generation and detection of PAM system with the help of Block diagram & comparison of all above.
	3 rd	5.3 Analog Pulse Modulation - Generation and detection of PWM system with the help of Block diagram & comparison of all above.

	4 th	5.3 Analog Pulse Modulation - Generation and detection of PPM system with the help of Block diagram & comparison of all above.
	5 th	5.4 Concept of Quantization of signal & Quantization error.
11th	1 st	5.4 Concept of Quantization of signal & Quantization error.
	2 nd	5.5 Generation & Demodulation of PCM system with Block diagram & its applications.
	3 rd	5.5 Generation & Demodulation of PCM system with Block diagram & its applications.
	4 th	5.6 Companding in PCM & Vocoder
	5 th	5.7 Time Division Multiplexing & explain the operation with circuit diagram.
12th	1 st	5.8 Generation & demodulation of Delta modulation with Block diagram.
	2 nd	5.8 Generation & demodulation of Delta modulation with Block diagram.
	3 rd	5.9 Generation & demodulation of DPCM with Block diagram.
	4 th	5.10 Comparison between PCM, DM , ADM & DPCM
	5 th	5.10 Comparison between PCM, DM , ADM & DPCM
13th	Unit-6: DIGITAL MODULATION TECHNIQUES.	
	1 st	6.1 Concept of Multiplexing (FDM) - (Basic concept , Transmitter & Receiver) & Digital modulation formats.
	2 nd	6.1 Concept of Multiplexing (TDM) - (Basic concept , Transmitter & Receiver) & Digital modulation formats.
	3 rd	6.2 Advantages of digital communication system over Analog system
	4 th	6.3 Digital modulation techniques & types.
	5 th	6.3 Digital modulation techniques & types.
14th	1 st	6.4 Generation and Detection of binary ASK, FSK
	2 nd	6.4 Generation and Detection of binary PSK, QPSK
	3 rd	6.4 Generation and Detection of binary QAM, MSK, GMSK.
	4 th	6.5 Working of T1-Carrier system.

	5 th	6.5 Working of T1-Carrier system.
15th	1 st	6.6 Spread Spectrum & its applications
	2 nd	6.7 Working operation of Spread Spectrum Modulation Techniques (DS SS & FH-SS).
	3 rd	6.7 Working operation of Spread Spectrum Modulation Techniques (DS SS & FH-SS).
	4 th	6.8 Define bit, Baud, symbol & channel capacity formula.(Shannon Theorems)
	5 th	6.9 Application of Different Modulation Schemes.