



# GOVERNMENT POLYTECHNIC, BALASORE

Government of Odisha

ସରକାରୀ ବହୁବୃତ୍ତି ଅନୁଷ୍ଠାନ, ବାଲେଶ୍ଵର

ACADEMIC LESSON PLAN FOR WINTER SEMESTER - 2024

DEPT. OF ELECTRONICS & TELECOMMUNICATION, GOVT. POLYTECHNIC, BALASORE

NAME OF THE FACULTY: JADUNATH MURMU (SR. LECTURER, E&TC)

TH.3: ANALOG & DIGITAL COMMUNICATION

<b>DISCIPLINE:</b> ELECTRONICS & TELECOMMUNICATION ENGINEERING	<b>SEMESTER:</b> 5TH	<b>NAME OF THE TEACHING FACULTY: :</b> JADUNATH MURMU
<b>SUBJECT:</b> ANALOG & DIGITAL COMMUNICATION	<b>NO OF DAYS /PER WEEK CLASS ALLOTTED:</b> 4	<b>SEMESTER FROM DATE:</b> 1 <sup>ST</sup> JULY 2024 <b>TO DATE:</b> <b>NO. OF WEEKS:</b> 15
<b>WEEK</b>	<b>CLASS DAY</b>	<b>THEORY TOPICS</b>
1st	1st	<b>Unit-1: Elements of Communication Systems.(10)</b> 1.1 Communication Process- Concept of Elements of Communication System & its Block diagram
	2nd	1.2 Source of information & Communication Channels.
	3rd	1.3 Classification of Communication systems ( Line & Wireless or Radio)
	4th	1.4 Modulation Process, Need of modulation and
	5th	classify modulation process
2nd	1st	1.5 Analog and Digital Signals & its conversion.
	2nd	1.5 Analog and Digital Signals & its conversion.
	3rd	1.6 Basic concept of Signals &
	4th	Signals classification (Analog and Digital)
	5th	1.7 Bandwidth limitation
3rd	1st	<b>Unit-2: Amplitude (linear) Modulation System (15)</b> 2.1 Amplitude modulation & derive the expression for amplitude modulation signal,
	2nd	power relation in AM wave & find Modulation Index.
	3rd	2.1 Amplitude modulation & derive the expression for amplitude modulation signal,
	4th	power relation in AM wave & find Modulation Index. ✓
	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
	4th	DSBSC signal
	5th	2.5 Methods of generating & detection SSB-SC signal (Indirect method only)
5th	1st	2.5 Methods of generating & detection SSB-SC signal (Indirect method only)
	2nd	2.6 Methods of generation DSB-SC signal (Ring Modulator ) and
	3rd	detection of DSB-SC signal (Synchronous detection)
	4th	2.7 Concept of Balanced modulators
	5th	2.8 Vestigial Side Band Modulation
6th	1st	<b>Unit-3: Angle Modulation Systems(10)</b> 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
	4th	3.3 Expression for Frequency Modulated Signal & Modulation Index and sideband of FM signal
	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	<b>Unit-4: AM &amp; FM TRANSMITTER &amp; RECEIVER(08)</b> 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	4.3 AM transmitter - working principle with Block Diagram
9th	1st	4.5 Working of super heterodyne radio receiver with Block diagram
	2nd	4.5 Working of super heterodyne radio receiver with Block diagram
	3rd	4.6 Working of FM Transmitter & Receiver with Block Diagram.
		<b>Unit-5: ANALOG TO DIGITAL CONVERSION &amp; PULSE MODULATION SYSTEM.(17)</b> 5.1 Concept of Sampling Theorem , Nyquist rate & Aliasing
	4th	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	5.3 Analog Pulse Modulation - Generation and detection of PAM, PWM & PPM system with the help of Block diagram & comparison of all above.
	4th	5.4 Concept of Quantization of signal & Quantization error.
	5th	5.5 Generation & Demodulation of PCM system with Block diagram & its applications.
11th	1st	5.5 Generation & Demodulation of PCM system with Block diagram & its applications.
	2nd	5.6 Companding in PCM & Vocoder
	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	5.9 Generation & demodulation of DPCM with Block diagram.
	2nd	5.9 Generation & demodulation of DPCM with Block diagram.
	3rd	5.10 Comparison between PCM, DM , ADM & DPCM
	4th	5.10 Comparison between PCM, DM , ADM & DPCM
	5th	5.10 Comparison between PCM, DM , ADM & DPCM
13th	1st	<b>Unit-6: DIGITAL MODULATION TECHNIQUES(15)</b> 6.1 Concept of Multiplexing (FDM & TDM)- ( Basic concept , Transmitter & Receiver) & Digital modulation formats.
	2nd	6.1 Concept of Multiplexing (FDM & TDM)- ( Basic concept , Transmitter & Receiver) & Digital modulation formats.
	3rd	6.2 Advantages of digital communication system over Analog system
	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	6.6 Spread Spectrum & its applications
	5th	6.7 Working operation of Spread Spectrum Modulation Techniques (DS-SS & FH-SS).
15th	1st	6.7 Working operation of Spread Spectrum Modulation Techniques (DS-SS & FH-SS).
	2nd	6.8 Define bit, Baud, symbol & channel capacity formula.(Shannon Theorems)
	3rd	6.8 Define bit, Baud, symbol & channel capacity formula.(Shannon Theorems)
	4th	6.9 Application of Different Modulation Schemes.
	5th	6.10 Types of Modem & its Application

Faculty  
28/08/2024

H.O.  
28/08/2024

Principal  
28/08/2024