

Discipline: <b>5<sup>TH</sup> SEM</b> <b>ELECTRONICS</b> and Telecommunication Engineering		Name of the Teaching Faculty: <b>Er. PARAMANANDA GOUDA &amp; Er. JYOTI PATRA</b>	
Subject: - <b>TH - 3</b> <b>ANALOG &amp; DIGITAL</b> <b>COMMUNICATION</b>	No. of days per week class allotted: <b>05</b>	Semester From Date: <b>01 October, 2021 To 08 January, 2022</b> No. of Weeks: <b>15</b>	
Week	SN	Class Day	Theory Topics
<b>1<sup>st</sup></b>	<b>Unit-1: Elements of Communication Systems.</b>		
	1.	1 <sup>st</sup>	1.1 Communication Process- Concept of Elements of Communication System & its Block diagram
	2.	2 <sup>nd</sup>	1.1 Communication Process- Concept of Elements of Communication System & its Block diagram
	3.	3 <sup>rd</sup>	1.2 Source of information & Communication Channels.
	4.	4 <sup>th</sup>	1.3 Classification of Communication systems ( Line )
	5.	5 <sup>th</sup>	1.3 Classification of Communication systems ( Wireless or Radio)
<b>2<sup>nd</sup></b>	6.	1 <sup>st</sup>	1.4 Modulation Process, Need of modulation
	7.	2 <sup>nd</sup>	1.4 Need of modulation and classify modulation process
	8.	3 <sup>rd</sup>	1.5 Analog and Digital Signals & its conversion.
	9.	4 <sup>th</sup>	1.6 Basic concept of Signals & Signals classification (Analog & Digital)
	10.	5 <sup>th</sup>	1.7 Bandwidth limitation
<b>3<sup>rd</sup></b>	<b>Unit-2: Amplitude (linear) Modulation System</b>		
	11.	1 <sup>st</sup>	2.1 Amplitude modulation & derive the expression for amplitude modulation signal, power relation in AM wave & find Modulation Index.
	12.	2 <sup>nd</sup>	2.1 Amplitude modulation & derive the expression for amplitude modulation signal, power relation in AM wave & find Modulation Index.
	13.	3 <sup>rd</sup>	2.1 Amplitude modulation & derive the expression for amplitude modulation signal, power relation in AM wave & find Modulation Index.
	14.	4 <sup>th</sup>	2.2 Generation of Amplitude Modulation (AM)- Linear level AM modulation only
	15.	5 <sup>th</sup>	2.3 Demodulation of AM wave (liner diode detector, square law detector)
<b>4<sup>th</sup></b>	16.	1 <sup>st</sup>	2.3 Demodulation of AM wave (Square law detector & PLL)
	17.	2 <sup>nd</sup>	2.4 Explain SSB signal and DSBSC signal
	18.	3 <sup>rd</sup>	2.5 Methods of generating & detection SSB-SC signal (Indirect method only)
	19.	4 <sup>th</sup>	2.6 Methods of generation DSB-SC signal (Ring Modulator ) and detection of DSB-SC signal (Synchronous detection)
	20.	5 <sup>th</sup>	2.6 Methods of generation DSB-SC signal (Ring Modulator ) and detection of DSB-SC signal (Synchronous detection)

5 <sup>th</sup>	21.	1 <sup>st</sup>	2.6 Methods of generation DSB-SC signal (Ring Modulator ) and detection of DSB-SC signal (Synchronous detection)
	22.	2 <sup>nd</sup>	2.7 Concept of Balanced modulators
	23.	3 <sup>rd</sup>	2.7 Concept of Balanced modulators
	24.	4 <sup>th</sup>	2.8 Vestigial Side Band Modulation
	25.	5 <sup>th</sup>	2.8 Vestigial Side Band Modulation
6 <sup>th</sup>	<b>Unit-3: Angle Modulation Systems.</b>		
	26.	1 <sup>st</sup>	3.1 Concept of Angle modulation & its types (PM & FM)
	27.	2 <sup>nd</sup>	3.1 Concept of Angle modulation & its types (PM & FM)
	28.	3 <sup>rd</sup>	3.2 Basic principle of Frequency Modulation & Frequency Spectrum of FM Signal.
	29.	4 <sup>th</sup>	3.3 Expression for Frequency Modulated Signal & Modulation Index and sideband of FM signal
	30.	5 <sup>th</sup>	3.4 Explain Phase modulation & difference of FM & PM)- working principle with Block Diagram
7 <sup>th</sup>	31.	1 <sup>st</sup>	3.5 Compare between AM and FM modulation (Advantages & Disadvantages)
	32.	2 <sup>nd</sup>	3.6 Methods of FM Generation (Indirect (Armstrong) method only) working principle with Block Diagram
	33.	3 <sup>rd</sup>	3.6 Methods of FM Generation (Indirect (Armstrong) method only) working principle with Block Diagram
	34.	4 <sup>th</sup>	3.7 Methods of FM Demodulator or detector (Forster-Seely & Ratio detector)- working principle with Block Diagram
	35.	5 <sup>th</sup>	3.7 Methods of FM Demodulator or detector (Forster-Seely & Ratio detector)- working principle with Block Diagram
8 <sup>th</sup>	<b>Unit-4: AM &amp; FM TRANSMITTER &amp; RECEIVER</b>		
	36.	1 <sup>st</sup>	4.1 Classification of Radio Receivers
	37.	2 <sup>nd</sup>	4.2 Define the terms Selectivity, Sensitivity, Fidelity and Noise Figure
	38.	3 <sup>rd</sup>	4.3 AM transmitter - working principle with Block Diagram
	39.	4 <sup>th</sup>	4.4 Concept of Frequency conversion, RF amplifier & IF amplifier ,Tuning, S/N ratio
	40.	5 <sup>th</sup>	4.5 Working of super heterodyne radio receiver with Block diagram
9 <sup>th</sup>	41.	1 <sup>st</sup>	4.5 Working of super heterodyne radio receiver with Block diagram
	42.	2 <sup>nd</sup>	4.6 Working of FM Transmitter & Receiver with Block Diagram.
	43.	3 <sup>rd</sup>	4.6 Working of FM Transmitter & Receiver with Block Diagram.
	<b>Unit-5: Analog To Digital Conversion &amp; Pulse Modulation System.</b>		
	44.	4 <sup>th</sup>	5.1 Concept of Sampling Theorem , Nyquist rate & Aliasing
	45.	5 <sup>th</sup>	5.1 Concept of Sampling Theorem , Nyquist rate & Aliasing

<b>10<sup>th</sup></b>	46.	1 <sup>st</sup>	5.2 Sampling Techniques ( Instantaneous, Natural, Flat Top)
	47.	2 <sup>nd</sup>	5.3 Analog Pulse Modulation - Generation and detection of PAM system with the help of Block diagram & comparison of all above.
	48.	3 <sup>rd</sup>	5.3 Analog Pulse Modulation - Generation and detection of PWM system with the help of Block diagram & comparison of all above.
	49.	4 <sup>th</sup>	5.3 Analog Pulse Modulation - Generation and detection of PPM system with the help of Block diagram & comparison of all above.
	50.	5 <sup>th</sup>	5.4 Concept of Quantization of signal & Quantization error.
<b>11<sup>th</sup></b>	51.	1 <sup>st</sup>	5.4 Concept of Quantization of signal & Quantization error.
	52.	2 <sup>nd</sup>	5.5 Generation & Demodulation of PCM system with Block diagram & its applications.
	53.	3 <sup>rd</sup>	5.5 Generation & Demodulation of PCM system with Block diagram & its applications.
	54.	4 <sup>th</sup>	5.6 Companding in PCM & Vocoder
	55.	5 <sup>th</sup>	5.7 Time Division Multiplexing & explain the operation with circuit diagram.
<b>12<sup>th</sup></b>	56.	1 <sup>st</sup>	5.8 Generation & demodulation of Delta modulation with Block diagram.
	57.	2 <sup>nd</sup>	5.8 Generation & demodulation of Delta modulation with Block diagram.
	58.	3 <sup>rd</sup>	5.9 Generation & demodulation of DPCM with Block diagram.
	59.	4 <sup>th</sup>	5.10 Comparison between PCM, DM , ADM & DPCM
	60.	5 <sup>th</sup>	5.10 Comparison between PCM, DM , ADM & DPCM
<b>13<sup>th</sup></b>	<b>Unit-6: DIGITALMODULATION TECHNIQUES.</b>		
	61.	1 <sup>st</sup>	6.1 Concept of Multiplexing (FDM) - (Basic concept , Transmitter & Receiver) & Digital modulation formats.
	62.	2 <sup>nd</sup>	6.1 Concept of Multiplexing (TDM) - (Basic concept , Transmitter & Receiver) & Digital modulation formats.
	63.	3 <sup>rd</sup>	6.2 Advantages of digital communication system over Analog system
	64.	4 <sup>th</sup>	6.3 Digital modulation techniques & types.
	65.	5 <sup>th</sup>	6.3 Digital modulation techniques & types.
<b>14<sup>th</sup></b>	66.	1 <sup>st</sup>	6.4 Generation and Detection of binary ASK, FSK
	67.	2 <sup>nd</sup>	6.4 Generation and Detection of binary PSK, QPSK
	68.	3 <sup>rd</sup>	6.4 Generation and Detection of binary QAM, MSK, GMSK.
	69.	4 <sup>th</sup>	6.5 Working of T1-Carrier system.
	70.	5 <sup>th</sup>	6.5 Working of T1-Carrier system.
<b>15<sup>th</sup></b>	71.	1 <sup>st</sup>	6.6 Spread Spectrum & its applications
	72.	2 <sup>nd</sup>	6.7 Working operation of Spread Spectrum Modulation Techniques (DS-SS & FH-SS).
	73.	3 <sup>rd</sup>	6.7 Working operation of Spread Spectrum Modulation Techniques (DS-SS & FH-SS).
	74.	4 <sup>th</sup>	6.8 Define bit, Baud, symbol & channel capacity formula.(Shannon Theorems)
	75.	5 <sup>th</sup>	6.9 Application of Different Modulation Schemes.