

UTKALMANI GOPABANDHU INSTITUTE OF **ENGINEERING, ROURKELA**



LESSON PLAN

SESSION: 2022-2023

DEPARTMENT OF ELECTRONICS AND **TELECOMMUNICATION ENGINEERING**

SUBJECT CODE: Th.3

**NAME OF THE SUBJECT: ANALOG AND DIGITAL
COMMUNICATION**

BRANCH: ELECTRONICS & TELECOMMUNICATION

SEMESTER: DIPLOMA 5TH SEM

NUMBER OF CLASSES ALLOTTED PER WEEK: 5

**TOTAL PERIODS ALLOTTED TO THE SUBJECT ACCORDING TO
SCTEVT: 75**

NAME OF THE FACULTY: MANASI PRIYADARSHINI

UTKALMANI GOPABANDHU INSTITUTE OF ENGINEERING,ROURKELA



LESSON PLAN

DEPARTMENT OF ELECTRONICS AND TELECOMMUNICATION ENGINEERING

SUBJECT CODE: Th.3
NAME: ANALOG AND DIGITAL COMMUNICATION
BRANCH: ELECTRONICS & TELECOMMUNICATION
SEMESTER: DIPLOMA -5TH SEM
NO OF CLASSES ALLOTTED PER WEEK: 5(15/09/2022 to 22/12/2022)
NAME OF THE FACULTY: MANASI PRIYADARSHINI

Week/Date	<u>Lecture</u>	<u>Topic to be covered</u>	Remarks
1 st week 15/09/2022 To 17/09/2022	1 st	<u>Unit-1: Elements of Communication Systems.</u> Communication Process- Concept of Elements of Communication System & its Block diagram	
	2 nd	Source of information & Communication Channels	
	3 rd	Classification of Communication systems (Line & Wireless or Radio)	
	4 th	Modulation Process, Need of modulation and classify modulation process	
	5 th	Analog and Digital Signals & its conversion.	
2 nd week 19/09/2022 To 24/09/2022	1 st	Basic concept of Signals & Signals classification (Analog and Digital)	
	2 nd	Bandwidth limitation	
	3 rd	<u>Unit-2: Amplitude (linear) Modulation System</u> Amplitude modulation & derive the expression for amplitude modulation	

	4 th	signal, power relation in AM wave & find Modulation Index.	
	5 th	Generation of Amplitude Modulation(AM)- Linear level AM modulation only	
3 rd week 26/09/2022 To 01/10/2022	1 st	Demodulation of AM waves liner diode detector	
	2 nd	square law detector & PLL	
	3 rd	Explain SSB signal and DSBSC signal	
	4 th	Methods of generating & detection SSB-SC signal (Indirect method only)	
	5 th	Methods of generation DSB-SC signal (Ring Modulator) and detection of DSB-SC signal (Synchronous detection)	

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Week/Date	Lecture	Topic to be covered	Remarks
4 th week 03/10/2022 To 08/10/2022	1 st	Concept of Balanced modulators	03/10/2022 TO 08/10/2022(durga puja holidays)Need 5 extra classes for adjustment
	2 nd	Vestigial Side Band Modulation	
	3 rd	Question discussion	
	4 th	<u>Unit-3: Angle Modulation Systems.</u> Concept of Angle modulation & its types (PM & FM)	
	5 th	Basic principle of Frequency Modulation & Frequency Spectrum of FM Signal.	
5 th week 10/10/2022 To 15/10/2022	1 st	continue	
	2 nd	Explain Phase modulation & difference of FM & PM)- working principle with Block Diagram	
	3 rd	continue	
	4 th	Expression for Frequency Modulated Signal & Modulation Index and sideband of FM signal	
	5 th	Compare between AM and FM modulation (Advantages & Disadvantages)	

<p>6th week 17/10/2022 To 22/10/2022</p>	1 st	Methods of FM Generation (Indirect (Armstrong) method only) working principle with Block Diagram	
	2 nd	Methods of FM Demodulator or detector (Forster-Seely & Ratio detector)- working principle with Block Diagram	
	3 rd	continue	
	4 th	Unit-4: AM & FM TRANSMITTER & RECEIVER Classification of Radio Receivers	
	5 th	Define the terms Selectivity, Sensitivity, Fidelity and Noise Figure	

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7 th week 24/10/2022 To 29/10/2022	1 st	AM transmitter - working principle with Block Diagram	24/10/2022(holiday)Need one extra class for adjustment
	2 nd	Concept of Frequency conversion, RF amplifier & IF amplifier ,Tuning, S/N ratio	
	3 rd	Working of super heterodyne radio receiver with Block diagram	
	4 th	Working of FM Transmitter & Receiver with Block Diagram	
	5 th	<u>Unit-5: ANALOG TO DIGITAL CONVERSION & PULSE MODULATION SYSTEM</u> Concept of Sampling Theorem , Nyquist rate & Aliasing	
8 th week 31/10/2022	1 st	Sampling Techniques (Instantaneous, Natural, Flat Top)	

To 05/11/2022	2 nd	Analog Pulse Modulation - Generation and detection of PAM,	
	3 rd	Analog Pulse Modulation - Generation and detection of PWM & PPM system with the help of Block diagram & comparison of all above	
	4 th	Concept of Quantization of signal & Quantization error.	
	5 th	Generation & Demodulation of PCM system with Block diagram & its applications.	
9 th week 07/11/2022 To 12/11/2022	1 st	Companding in PCM & Vocoder	08/11/2022(holiday). one extra class needed for adjustment
	2 nd	Time Division Multiplexing & explain the operation with circuit diagram	
	3 rd	Generation & demodulation of Delta modulation with Block diagram.	
	4 th	Generation & demodulation of DPCM with Block diagram	
	5 th	continue	

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Week/Date	Lecture	Topic to be covered	Remarks
10 th week 14/11/2022 To 19/11/2022	1 st	Comparison between PCM, DM , ADM & DPCM	Internal assessment exam will be started from 14/11/2022 and will be completed on 18/11/2022. 5 extra classes needed for adjustment
	2 nd	Question discussion	
	3 rd	Unit-6: DIGITAL MODULATION TECHNIQUES. Concept of Multiplexing (FDM & TDM)- (Basic concept , Transmitter & Receiver)	
	4 th	Digital modulation formats.	
	5 th	Advantages of digital communication system over Analog system	
11 th week 21/11/2022 To 26/11/2022	1 st	Digital modulation techniques & types.	
	2 nd	Generation and Detection of binary ASK	
	3 rd	Generation and Detection of binary FSK	
	4 th	Generation and Detection of binary PSK	
	5 th	Generation and Detection of binary QPSK	

12 th week 28/11/2022 To 03/12//2022	1 st	Generation and Detection of binary QAM	
	2 nd	Generation and Detection of binary MSK	
	3 rd	Generation and Detection of binary GMSK	
	4 th	Working of T1-Carrier system.	
	5 th	Spread Spectrum & its applications	

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13 th week 05/12/2022 To 10/12//2022	1 st	Working operation of Spread Spectrum Modulation Techniques (DS-SS & FH-SS).	
	2 nd	Define bit, Baud, symbol & channel capacity formula.(Shannon Theorems)	
	3 rd	Application of Different Modulation Schemes.	
	4 th	Types of Modem & its Application	
	5 th	CHAPTER 1SHORT QUESTION DISCUSSION	
14 th week 12/12/2022 to 17/12/2022	1 st	CHAPTER 2 SHORT QUESTION DISCUSSION	
	2 nd	CHAPTER 3 SHORT QUESTION DISCUSSION	
	3 rd	CHAPTER 4 SHORT QUESTION DISCUSSION	
	4 th	CHAPTER 5 SHORT QUESTION DISCUSSION	

	5 th	CHAPTER 6 SHORT QUESTION DISCUSSION	
15 th Week 19/12/2022 to 24/12/2022	1 st	CHAPTER 1,2&3 LONG QUESTION T AND PREVIOUS YEAR QUESTION DISCUSSION	Classes will be continued upto 22/12/2022 as per academic calender
	2 nd	CHAPTER 4,5 & 6LONG QUESTION AND PREVIOUS YEAR QUESTION DISCUSSION	
	3 rd	VERY SIMILAR TEST(VST)	
	4 th		
	5 th		