UTKALMANI GOPABANDHU INSTITUTE OF ENGINEERING, ROURKELA

LESSON PLAN

SESSION: 2025-2026

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 ALLOTED PER WEEK: 5

TOTAL PERIODS ALLOTED TO THE SUBJECT ACCORDING TO SCTEVT: 75

NAME OF THE FACULTY: MANASI PRIYADARSHINI

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NO. OF CLASSES ALLOTTED PER WEEK: 5(14/07/2025 to 15/11/2025)

NAME OF THE FACULTY: MANASI PRIYADARSHINI

Week/Date	Lecture	Topic to be covered
1st week	1st	**Unit-1: Elements of Communication Systems.** Communication Process- Concept of Elementsof Communication System & its Block diagram
	2nd	Source of information & CommunicationChannels
	3rd	Classification of Communication systems (Line& Wireless or Radio)
	4th	Modulation Process, Need of modulation andclassify modulation process
	5th	Analog and Digital Signals & its conversion.
2nd week	1st	Basic concept of Signals & Signals classification(Analog and Digital)
	2nd	Bandwidth limitation
	3rd	**Unit-2: Amplitude (linear) ModulationSystem** Amplitude modulation & derive theexpression for amplitude modulation

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

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Week/Date	Lecture	Topic to be covered
4th week	1st	Concept of Balanced modulators
	2nd	Vestigial Side Band Modulation
	3rd	**Question discussion**
	4th	**Unit-3: Angle Modulation Systems.** Concept of Angle modulation & its types (PM &FM)
	5th	Basic principle of Frequency Modulation &Frequency Spectrum of FM Signal.
5th week	1st	**continue**
	2nd	Explain Phase modulation & difference of FM &PM)- working principle with Block Diagram
	3rd	**continue**
	4th	Expression for Frequency Modulated Signal &Modulation Index and sideband of FM signal
	5th	Compare between AM and FM modulation(Advantages & Disadvantages)

6th week	1st	Methods of FM Generation (Indirect (Armstrong) method only) working principle with Block Diagram
	2nd	Methods of FM Demodulator or detector (Forster-Seely & Ratio detector)-workingprinciple with Block Diagram
	3rd	**continue**
	4th	**Unit-4: AM & FM TRANSMITTER &RECEIVER** Classification of Radio Receivers
	5th	Define the terms Selectivity, Sensitivity, Fidelityand Noise Figure

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Week/Date	Lecture	Topic to be covered
7th week	1st	AM transmitter - working principle with BlockDiagram
	2nd	Concept of Frequency conversion, RF amplifier& IF amplifier ,Tuning, S/N ratio
	3rd	Working of super heterodyne radio receiver withBlock diagram
	4th	Working of FM Transmitter & Receiver withBlock Diagram
	5th	**Unit-5: ANALOG TO DIGITAL CONVERSION & PULSE MODULATION SYSTEM** Concept of Sampling Theorem , Nyquist rate &Aliasing
8th week	1st	Sampling Techniques (Instantaneous, Natural,Flat Top)

	2nd	Analog Pulse Modulation - Generation anddetection of PAM,
	3rd	Analog Pulse Modulation - Generation and detection of PWM & PPM system with the helpof Block diagram & comparison of all above
	4th	Concept of Quantization of signal &Quantization error.
	5th	Generation & Demodulation of PCM systemwith Block diagram & its applications.
9th week	1st	Companding in PCM & Vocoder
	2nd	Time Division Multiplexing & explain theoperation with circuit diagram
	3rd	Generation & demodulation of Delta modulationwith Block diagram.
	4th	Generation & demodulation of DPCM withBlock diagram
	5th	**continued**

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Week/Date	Lecture	Topic to be covered
10th week	1st	Comparison between PCM, DM , ADM &DPCM
	2nd	**Question discussion**
	3rd	**Unit-6: DIGITALMODULATIONTECHNIQUES.** Concept of Multiplexing (FDM & TDM)- (Basic concept , Transmitter & Receiver)
	4th	Digital modulation formats.
	5th	Advantages of digital communication system over Analog system
11th week	1st	Digital modulation techniques & types.
	2nd	Generation and Detection of binary ASK
	3rd	Generation and Detection of binary FSK
	4th	Generation and Detection of binary PSK
	5th	Generation and Detection of binary QPSK

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

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Week/Date	Lecture	Topic to be covered
13th week	1st	Working operation of Spread Spectrum Modulation Techniques (DS-SS & FH-SS).
	2nd	Define bit, Baud, symbol & channel capacityformula.(Shannon Theorems)
	3rd	Application of Different Modulation Schemes.
	4th	Types of Modem & its Application
	5th	**CHAPTER 1SHORT QUESTION DISCUSSION**
14th week	1st	**CHAPTER 2 SHORT QUESTION DISCUSSION**
	2nd	**CHAPTER 3 SHORT QUESTION DISCUSSION**
	3rd	**CHAPTER 4 SHORT QUESTION DISCUSSION**
	4th	**CHAPTER 5 SHORT QUESTION DISCUSSION**

	5th	**CHAPTER 6 SHORT QUESTION DISCUSSION**
15th Week	1st	**CHAPTER 1,2&3 LONG QUESTION T ANDPREVIOUS YEAR QUESTION DISCUSSION**
	2nd	**CHAPTER 4,5 & 6LONG QUESTION ANDPREVIOUS YEAR QUESTION DISCUSSION**
	3rd	**VERY SIMILAR TEST(VST)(1st chapter)**
	4th	**VERY SIMILAR TEST(VST) (2nd chapter)**
	5th	**VERY SIMILAR TEST(VST) (3rd chapter)**
16th Week	1st	**VERY SIMILAR TEST(VST) (4th chapter)**
	2nd	**VERY SIMILAR TEST(VST) (5th chapter)**
	3rd	**VERY SIMILAR TEST(VST) (6th chapter)**
	4th	**VERY SIMILAR TEST(VST) (all chapters)**
	5th	**VERY SIMILAR TEST(VST) (all chapters)**
17th Week	1st	**VERY SIMILAR TEST(VST) (all chapters)**
	2nd	**VERY SIMILAR TEST(VST) (all chapter)**
	3rd	**VERY SIMILAR TEST(VST) (all chapter)**
	4th	**VERY SIMILAR TEST(VST) (all chapters)**
	5th	**VERY SIMILAR TEST(VST) (all chapters)**
18th Week	1st	**VERY SIMILAR TEST(VST) (all chapter)**
	2nd	**VERY SIMILAR TEST(VST) (all chapter)**
	3rd	**VERY SIMILAR TEST(VST) (all chapter)**
	4th	**VERY SIMILAR TEST(VST) (all chapter)**
	5th	**VERY SIMILAR TEST(VST) (all chapter)**