**LESSON PLAN**

|  |  |  |
| --- | --- | --- |
| **Discipline:**  E&TC Engg. | **Semester:**  Fifth (5th ) | **Name Of The Faculty:**  Er Debasmita Mohapatra |
| **Subject:**  ANALOG & DIGITAL COMMUNICATION | **No of days/ week class allotted:** Six(6) | **Semester from date:** 01.07.2024 **to Date:**08**.** 11.2024  **No of weeks: 15** |
| **WEEK** | **CLASS DAY** | **THEORY TOPICS** |
| 1st | 1st | **Chapter No.- 1: Elements Of Communication Systems**  Introduction |
| 2nd | Communication Process- Concept of Elements of Communication System & its Block diagram |
| 3rd | Source of information & Communication Channels. |
| 4th | Classification of Communication systems (Line & Wireless or Radio) |
| 5th | Modulation Process, need of modulation and classify modulation process |
| 6th | Analog and Digital Signals & its conversion. |
| 2nd | 1st | Basic concept of Signals & Signals classification (Analog and Digital) |
| 2nd | Bandwidth limitation |
| 3rd | **Review** |
| 4th | **Chapter No.- 2: Amplitude (Linear) Modulation System**  Amplitude modulation & derive the expression for amplitude modulation signal |
| 5th | power relation in AM wave & find Modulation Index |
| 6th | Generation of Amplitude Modulation (AM)- Linear level AM modulation only |
| 3rd | 1st | Demodulation of AM waves (liner diode detector |
| 2nd | square law detector & PLL) |
| 3rd | Explain SSB signal and DSBSC signal |
| 4th | Methods of generating & detection SSB-SC signal |
| 5th | (Indirect method only) |
| 6th | ***Monthly Test- 1*** |
| 4th | 1st | Methods of generation DSB-SC signal (Ring Modulator) |
| 2nd | And detection of DSB-SC signal |
| 3rd | Concept of Balanced modulators |
| 4th | Vestigial side band Modulation |
| 5th | **Review** |
| 6th | **Chapter No.- 3:** **Angle Modulation Systems**  Concept of Angle modulation & its types (PM & FM) |
| 5th | 1st | Basic principle of Frequency Modulation & Frequency Spectrum of FM Signal |
| 2nd | Expression for Frequency Modulated Signal & Modulation Index and sideband of FM signal |
| 3rd | Explain Phase modulation & difference of FM & PM)- working principle with Block Diagram |
| 4th | Compare between AM and FM modulation (Advantages & Disadvantages) |
| 5th | Methods of FM Generation (Indirect (Armstrong) method only) working principle with Block Diagram |
| 6th | Methods of FM Demodulator or detector (Forster-Seely & Ratio detector)- working principle with Block Diagram |
| 6th | 1st | **Review** |
| 2nd | **Chapter No.- 4:** **Am & Fm Transmitter & Receiver**  Classification of Radio Receivers |
| 3rd | Define the terms Selectivity, Sensitivity, Fidelity and Noise Figure |
| 4th | AM transmitter - working principle with Block Diagram |
| 5th | Concept of Frequency conversion, RF amplifier & IF amplifier, Tuning, S/N ratio |
| 6th | ***Monthly Test- 2*** |
| 7th | 1st | Working of super heterodyne radio receiver with Block diagram |
| 2nd | Working of FM Transmitter & Receiver with Block Diagram. |
| 3rd | **Review** |
| 4th | **Chapter No.- 5:** **Analog To Digital Conversion & Pulse Modulation System** Concept of Sampling Theorem |
| 5th | Nyquist rate & Aliasing |
| 6th | Sampling Techniques (Instantaneous, Natural, Flat Top) |
| 8th | 1st | Analog Pulse Modulation - Generation and detection of PAM, PWM . |
| 2nd | & PPM system with the help of  Block diagram & comparison of all above. |
| 3rd | Concept of Quantization of signal & Quantization error |
| 4th | Generation & Demodulation of PCM system with Block diagram |
| 5th | & its applications. |
| 6th | Companding in PCM & Vocoder |
| 9th | 1st | Time Division Multiplexing & explain the operation with circuit diagram |
| 2nd | Generation of Delta modulation with Block diagram |
| 3rd | & demodulation of Delta modulation with Block diagram |
| 4th | Generation & demodulation of DPCM with Block diagram |
| 5th | Comparison between PCM, DM, ADM & DPCM |
| 6th | ***Monthly Test- 3*** |
| 10th | 1st | Comparison between ADM & DPCM |
| 2nd | **Review** |
| 3rd | **Chapter No.- 6: *Digitalmodulation Techniques***  Concept of Multiplexing (FDM & TDM)- (Basic concept, Transmitter & Receiver) |
| 4th | & Digital modulation formats. |
| 5th | Advantages of digital communication system over Analog system |
| 6th | Digital modulation techniques & types |
| 11th | 1st | Generation and Detection of binary ASK, FSK, PSK, |
| 2nd | QPSK, QAM, MSK, GMSK |
| 3rd | Working of T1-Carrier system |
| 4th | Spread Spectrum & its applications |
| 5th | ***Monthly Test- 4*** |
| 6th | Working operation of Spread Spectrum Modulation Techniques (DS-SS & FH-SS) |
| 12th | 1st | Define bit, Baud, symbol |
| 2nd | & channel capacity formula. (Shannon Theorems) |
| 3rd | Application of Different Modulation Schemes |
| 4th | Types of Modem & its Application |
| 5th | **Review** |
| 6th | Review Class for Chapter No.- 01 |
| 13th | 1st | Review Class for Chapter No.- 01 |
| 2nd | Review Class for Chapter No.- 02 |
| 3rd | Review Class for Chapter No.- 02 |
| 4th | Review Class for Chapter No.- 02 |
| 5th | Review Class for Chapter No.- 03 |
| 6th | Review Class for Chapter No.- 03 |
| 14th | 1st | Review Class for Chapter No.- 03 |
| 2nd | Review Class for Chapter No.- 04 |
| 3rd | Review Class for Chapter No.- 04 |
| 4th | Review Class for Chapter No.- 04 |
| 5th | Review Class for Chapter No.- 05 |
| 6th | Review Class for Chapter No.- 05 |
| 15th | 1st | Review Class for Chapter No.- 05 |
| 2nd | Review Class for Chapter No.- 06 |
| 3rd | Previous Year (W- 22) Question Answer Discussion |
| 4th | Previous Year (W- 22) Question Answer Discussion |
| 5th | Previous Year (W- 21) Question Answer Discussion |
| 6th | Previous Year (W- 21) Question Answer Discussion |

*Chapters covered up to IA****: 1, 2 , 3*& 4.**