

LESSON PLAN		
ACADEMIC LESSON PLAN OF WINTER-2025		
Discipline:ETC	Semester: 3rd	Name of the Teaching Faculty: Laxmi Priya Khuntia
Subject: Electronics Measurement & Instrumentation	No of Days / per week class allotted: 3	Semister from date: 14/07/2025 to 15/11/2025 No of weeks: 15
Week	Class Day	Theory Topics
1st	1st	Unit-1: Qualities of Measurement(04) 1.1 Discuss the Static Characteristics
	2nd	1.2 Accuracy, sensitivity, reproducibility and static error of instruments
	3rd	1.3 Dynamic characteristics and speed of instruments.
2nd	1st	1-4 Errors of an instrument
	2nd	Unit-2: Indicating Instruments (07) 2.1 Introduction 2.2 Types of Indicating Instruments 2.3 Basic operating principle of Indicating Instruments
	3rd	2.4 Working principle of permanent magnetic moving coil Instruments
3rd	1st	2.5 Working principle of Moving Iron Instrument
	2nd	2.6 Basic principle of operation of DC Ammeter and Multi range Ammeter 2.7 Basic principle of operation of AC Ammeter and Multi range Ammeter
	3rd	2.8 Basic principle of operation of DC Voltmeter and its applications 2.9 Basic principle of operation of AC Voltmeter and its application
4th	1st	2.10 Basic principle of Ohm Meter (Series & Shunt type)
	2nd	2.11 Basic principle of Analog Multimeter and its types & applications 2.12 Operation of Q meter and its essentials
	3rd	Unit-3: Digital Instruments(07) 3.1 Principle of operation of Ramp type Digital Voltmeter & applications
5th	1st	3.2 Operation of display of Digital Multimeter & Resolution and Sensitivity
	2nd	3.3 Basic Operating principle of Digital Multimeter, its types & applications
	3rd	3.4 Basic Operating principle of Digital Frequency Meter
6th	1st	3.5 Digital Measurement of Time 3.6 Measurement of Frequency
	2nd	3.7 Operating principle of Digital Tachometer
	3rd	3.8 LCR meter & its working principle
7th	1st	Unit-4: Oscilloscope(07) 4.1 Basic Operating principle of Oscilloscope & its Block Diagram
	2nd	4.1 Basic Operating principle of Oscilloscope & its Block Diagram
	3rd	4.2 Basic Operating principle of Dual Trace Oscilloscope & its specification
8th	1st	4.3 CRO Measurements, 4.4 Lissajous figures
	2nd	4.4 Applications of Oscilloscope in measurement of Voltage and frequency
	3rd	4.5 Basic Operating principle of Digital Storage Oscilloscope
9th	1st	4.6 Basic Operating principle of High frequency Oscilloscope
	2nd	Unit-5: Bridges (06) 5.1 Types of Bridges (DC & AC Bridges) 5.2 DC Bridges (Measurement of Resistance by Wheatstone's Bridge)
	3rd	5.3 AC bridges (Measurement of inductance by Maxwell's Bridge & Hay's Bridge)
	1st	5.3 Measurement of capacitance by Schering's Bridge & DeSauty Bridge

10th	2nd	5.5 Working principle of Q meter its circuit diagram & measurement of Low impedance
	3rd	5.6 Measurement of frequency
11th	1st	5.7 LCR Meter & its measurements.
	2nd	Unit-6: Transducers & Sensors(07) 6.1 Define Transducer and Sensor 6.2 Type of Transducer 6.3 Parameters and advantages of Transducer
	3rd	6.4 Working principle of Strain Gauges, 6.5 Define Strain Gauge (No mathematical Derivation)
12th	1st	6.6 Working principle of LVDT
	2nd	6.7 Working principle of capacitive transducers (pressure) 6.8 Working principle of Load Cell (Pressure Cell)
	3rd	6.9 Working principle of Temperature Transducer (RTD, Optical Pyrometer, Thermocouple, and Thermister)
13th	1st	6.10 Working principle of Current transducer.
	2nd	6.11 Working principle of Proximity & Light sensors.
	3rd	Unit-7: Signal Generator, Wave Analyser & DAS (07) 7.1 General aspect & classification of Signal generators
14th	1st	7.2 Working principle of AF Sine and Square wave generator
	2nd	7.2 Working principle of AF Sine and Square wave generator
	3rd	7.3 Working principle of the Function Generator
15th	1st	7.4 Function of basic Wave Analyser and Spectrum Analyser
	2nd	7.4 Function of basic Wave Analyser and Spectrum Analyser
	3rd	7.5 Basic concept of Data Acquisition System (DAS)

Laxmi Priya Khuntia
Signature of the faculty

LESSON PLAN (WINTER-2025)		
Discipline: ETC	Semester:5th	Name of the Teaching Faculty: Laxmi Priya Khuntia
Subject:ANALOG & DIGITAL COMMUNICATION	No of Days /per week class allotted: 5	Semester From date: 14/07/2025 to 15/11/2025 No of Weeks:15
Week	Class Day	Theory Topics
1st	1st	Unit-1: Elements of Communication Systems.(10) 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	Unit-2: Amplitude (linear) Modulation System (15) 2.1 Amplitude modulation & derive the expression for amplitude modulation signal,
	2nd	power relation in AM wave & find Modulation Index.
	3rd	2.2 Generation of Amplitude Modulation(AM)- Linear level AM modulation only
	4th	2.2 Generation of Amplitude Modulation(AM)- Linear level AM modulation only
	5th	2.3 Demodulation of AM waves (liner diode detector, square law detector & PLL)
4th	1st	2.3 Demodulation of AM waves (liner diode detector, square law detector & PLL)
	2nd	2.4 Explain SSB signal
	3rd	2.4 Explain SSB signal
	4th	Explain DSBSC signal
	5th	2.5 Methods of generating SSB-SC signal (Indirect method only)
5th	1st	2.5 Methods of detection SSB-SC signal (Indirect method only)
	2nd	2.6 Methods of generation DSB-SC signal (Ring Modulator)
	3rd	detection of DSB-SC signal (Synchronous detection)
	4th	2.7 Concept of Balanced modulators
	5th	2.8 Vestigial Side Band Modulation
6th	1st	Unit-3: Angle Modulation Systems(10) 3.1 Concept of Angle modulation & its types (PM & FM)
	2nd	3.2 Basic principle of Frequency Modulation & Frequency Spectrum of FM Signal.
	3rd	3.2 Basic principle of Frequency Modulation & Frequency Spectrum 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	3.4 Explain Phase modulation & difference of FM & PM)- working principle with Block Diagram
	2nd	3.5 Compare between AM and FM modulation (Advantages & Disadvantages)
	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	Unit-4: AM & FM TRANSMITTER & RECEIVER(08) 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
		4.3 AM transmitter - working principle with Block Diagram
	4th	4.5 Working of super heterodyne radio receiver with Block diagram
9th	1st	4.5 Working of super heterodyne radio receiver with Block diagram
	2nd	4.6 Working of FM Transmitter & Receiver with Block Diagram.
	3rd	4.6 Working of FM Transmitter & Receiver with Block Diagram.
	4th	Unit-5: ANALOG TO DIGITAL CONVERSION & PULSE MODULATION SYSTEM.(17) 5.1 Concept of Sampling Theorem , Nyquist rate & Aliasing
	5th	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	Continue
	3rd	Continue
	4th	Continue
	5th	5.4 Concept of Quantization of signal & Quantization error.
11th	1st	5.5 Generation of PCM system with Block diagram & its applications.
	2nd	5.5 Demodulation of PCM system with Block diagram & its applications.
	3rd	5.6 Companding in PCM & Vocoder
	4th	5.7 Time Division Multiplexing & explain the operation with circuit diagram.
	5th	5.7 Time Division Multiplexing & explain the operation with circuit diagram.
12th	1st	5.8 Generation of Delta modulation with Block diagram.
	2nd	5.8 demodulation of Delta modulation with Block diagram.
	3rd	5.9 Generation of DPCM with Block diagram.
	4th	5.9 Demodulation of DPCM with Block diagram.
	5th	5.10 Comparison between PCM, DM , ADM & DPCM
13th	1st	Unit-6: DIGITALMODULATION TECHNIQUES(15) 6.1 Concept of Multiplexing (FDM & TDM)- (Basic concept , Transmitter & Receiver) & Digital modulation formats.
	2nd	6.2 Advantages of digital communication system over Analog system
	3rd	6.3 Digital modulation techniques & types.
	4th	6.4 Generation and Detection of binary ASK, FSK.
	5th	6.4 Generation and Detection of binary ASK, FSK.
14th	1st	6.4 Generation and Detection of binary PSK, QPSK
	2nd	6.4 Generation and Detection of binary PSK, QPSK
	3rd	6.4 Generation and Detection of binary QAM, MSK, GMSK.
	4th	6.5 Working of T1-Carrier system.
	5th	6.6 Spread Spectrum & its applications
15th	1st	6.7 Working operation of Spread Spectrum Modulation Techniques (DS-SS & FH-SS).
	2nd	6.7 Working operation of Spread Spectrum Modulation Techniques (DS-SS & FH-SS).
	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

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LESSON PLAN (WINTER-2025)

Discipline: ETC	Semester: 5th	Name of the Teaching Faculty: Laxmi Priya Khuntia
Subject: WAVE PROPAGATION & BROADBAND COMMUNICATION ENGINEERING	No of Days /per week class allotted: 4	Semester From date: 14/07/2025 to 15/11/2025 No of Weeks:18
Week	Class Day	Theory Topics
1st	1st	Unit-1: WAVE PROPAGATION & ANTENNA(12) 1.1 Effects of environments such as reflection, refraction, interference, diffraction, absorption and attenuation (Definition only)
	2nd	1.2 Classification based on Modes of Propagation-Ground wave, Ionosphere , Sky wave propagation, Space wave propagation
	3rd	1.3 Definition – critical frequency, max. useable frequency, skip distance, fading, Duct propagation & Troposphere scatter propagation actual height and virtual height
	4th	Continue
2nd	1st	1.4 Radiation mechanism of an antenna-Maxwell equation.
	2nd	1.5 Definition - Antenna gains, Directive gain, Directivity, effective aperture, polarization, input impedance, efficiency, Radiator resistance, Bandwidth, Beam width, Radiation pattern
	3rd	Continue
	4th	1.6 Antenna -types of antenna: Mono pole and dipole antenna and omni directional antenna
3rd	1st	Continue
	2nd	1.7 Operation of following antenna with advantage & applications. a) Directional high frequency antenna : , Yagi & Rohmbus only
	3rd	b) UHF & Microwave antenna.: Dish antenna (with parabolic reflector) & Horn antenna
	4th	1.8 Basic Concepts of Smart Antennas- Concept and benefits of smart antennas
4th	1st	Unit-2: TRANSMISSION LINES(10) 2.1 Fundamentals of transmission line.
	2nd	2.2 Equivalent circuit of transmission line & RF equivalent circuit
	3rd	2.3 Characteristics impedance, methods of calculations & simple numerical.
	4th	Continue
5th	1st	2.4 Losses in transmission line.
	2nd	2.5 Standing wave – SWR, VSWR,
	3rd	Reflection coefficient, simple numerical.
	4th	2.6 Quarter wave & half wavelength line
6th	1st	2.7 Impedance matching & Stubs – single & double
	2nd	2.8 Primary & secondary constant of X-mission line.
	3rd	Unit-3: TELEVISION ENGINEERING(13) 3.1 Define-Aspect ratio, Rectangular Switching. Flicker, Horizontal Resolution, Video bandwidth, Interlaced scanning, Composite video signal, Synchronization pulses
	4th	Continue
7th	1st	3.2 TV Transmitter – Block diagram & function of each block.
	2nd	3.3 Monochrome TV Receiver -Block diagram & function of each block.
	3rd	3.4 Colour TV signals (Luminance Signal & Chrominance Signal,(I & Q,U & V Signals).

	4th	3.5 Types of Televisions by Technology- cathode-ray tube TVs, Plasma Display Panels,
8th	1st	Digital Light Processing (DLP), Liquid Crystal Display (LCD)
	2nd	Organic Light-Emitting Diode (OLED) Display, Quantum Light-Emitting Diode (QLED) – only Comparison based on application
	3rd	3.6 Discuss the principle of operation - LCD display,
	4th	Large Screen Display.
9th	1st	3.7 CATV systems & Types & networks
	2nd	3.8 Digital TV Technology-Digital TV Signals, Transmission of digital TV signals & Digital TV receiver Video programme processor unit.
	3rd	Continue
	4th	Unit-4: MICROWAVE ENGINEERING(15) 4.1 Define Microwave Wave Guides.4.2 Operation of rectangular wave guides and its advantage.
10th	1st	4.2 Operation of rectangular wave guides and its advantage.
	2nd	4.3 Propagation of EM wave through wave guide with TE & TM modes.
	3rd	4.3 Propagation of EM wave through wave guide with TE & TM modes.
	4th	4.4 Circular wave guide.
11th	1st	4.5 Operational Cavity resonator.
	2nd	4.6 Working of Directional coupler
	3rd	4.6 Working of Isolators
	4th	4.6 Working of Circulator.
12th	1st	4.7 Microwave tubes-Principle of operation of two Cavity Klystron.
	2nd	4.7 Microwave tubes-Principle of operation of two Cavity Klystron.
	3rd	4.8 Principle of Operations of Travelling Wave Tubes
	4th	4.9 Principle of Operations of Cyclotron
13th	1st	4.10 Principle of Operations of Tunnel Diode & Gunn diode
	2nd	4.10 Principle of Operations of Tunnel Diode & Gunn diode
	3rd	Unit-5: Broadband communication (10) 5.1 Broadband communication system-Fundamental of Components and
	4th	5.1 Broadband communication system-Fundamental of Components
14th	1st	5.2 Cable broadband data network- architecture
	2nd	importance & future of broadband telecommunication internet based network.
	3rd	5.4 ISDN - ISDN Devices interfaces,
	4th	ISDN Devices Architecture
15th	1st	ISDN Devices applications
	2nd	5.5 BISDN -interfaces & Terminals
	3rd	5.5 BISDN -protocol, architecture, applications
	4th	5.5 BISDN -protocol, architecture, applications

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