UTKAL GOURAV MADHUSUDAN INSTITUTE OF TECHNOLOGY, RAYAGADA

DEPARTMENT OF ELECTRONICS & TELECOMMUNICATION ENGINEERING

LESSON PLAN

SEMESTER-3RD

SESSION –WINTER(2026)

SUBJECT-TH-4-Electronics Measurement and Instrumentation

NAME OF THE FACULTY: SUBHEN KUMAR BEHERA

Name of the teaching faculty- *SUBHEN KUMAR BEHERA*
Department: ETC Engg , Semester: 3rd
Semester from- Date: 01/07/2026 To Date:05.11.2026
Subject: Theory4-: Electronics Measurement and Instrumentation
No of Periods per week: 3, Total Periods: 45,
End semester Exam: 70 Marks, Progressive Assessment/: 30 Marks,
Total Marks: 100 Marks

Week	*Period*	*Unit/Chapter*	*Topic to be Covered*
1st	*1st*	**Unit-1 Qualities of Measurement**	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**	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 2.5 Working principle of Moving Iron Instrument
3rd	*1st*		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
	2nd		2.8 Basic principle of operation of DC Voltmeter and its applications 2.9 Basic principle of operation of AC Voltmeter and its application
	3RD		2.11 Basic principle of Analog Multimeter and its types & applications
4th	*1st*		2.12 Operation of Q meter and its essentials
	2nd	**Unit-3 Digital Instruments**	3.1 Principle of operation of Ramp type Digital Voltmeter & applications
	3RD		3.2 Operation of display of Digital Multimeter & Resolution and Sensitivity
5th	*1st*		3.3 Basic Operating principle of Digital Multimeter, its types & applications

	2nd		3.4 Basic Operating principle of Digital Frequency Meter
	3RD		3.5 Digital Measurement of Time 3.6 Measurement of Frequency
6th	*1st*		3.7 Operating principle of Digital Tachometer
	2nd		3.8 LCR meter & its working principle
	3RD	Unit-4 Oscilloscope	4.1 Basic Operating principle of Oscilloscope & its Block Diagram
7th	*1st*		4.2 Basic Operating principle of Dual Trace Oscilloscope & its specification
	2nd		4.3 CRO Measurements
	3RD		4.4 Lissajous figures
8th	*1st*		4.5 Applications of Oscilloscope in measurement of Voltage and frequency
	2nd		4.5 Basic Operating principle of Digital Storage Oscilloscope
	3RD		4.6 Basic Operating principle of High frequency Oscilloscope
9th	*1st*	Unit-5 Bridges	5.1 Types of Bridges (DC & AC Bridges)
	2nd		5.2 DC Bridges (Measurement of Resistance by Wheatstone's Bridge) 5.3 AC bridges (Measurement of inductance by Maxwell's Bridge & Hay's Bridge)
	3RD		5.4 Measurement of capacitance by Schering's Bridge & DeSauty Bridge
10th	*1st*		5.5 Working principle of Q meter its circuit diagram& measurement of Low impedance
	2nd		5.6 Measurement of frequency
	3RD		5.7 LCR Meter & its measurements.)
11th	*1st*	Unit-6 Transducers & Sensors	6.1 Define Transducer and Sensor 6.2 Type of Transducer
	2nd		6.3 Parameters and advantages of Transducer 6.4 Working principle of Strain Gauges,.
	3RD		6.5 Define Strain Gauge (No mathematical Derivation) 6.6 Working principle of LVDT
12th	*1st*		6.7 Working principle of capacitive transducers (pressure)

			6.8 Working principle of Load Cell (Pressure Cell)
	2nd		6.9 Working principle of Temperature Transducer (RTD, Optical Pyrometer, Thermocouple, and Thermister)
	3RD		6.10 Working principle of Current transducer.
13th	*1st*		6.11 Working principle of Proximity & Light sensors.
	2nd	Unit-7 Signal Generator, Wave Analyser & DAS	7.1 General aspect & classification of Signal generators
	3RD		7.2 Working principle of AF Sine and Square wave generator
14th	*1st*		7.2 Working principle of AF Sine and Square wave generator
	2nd		7.3 Working principle of the Function Generator
	3RD		7.4 Function of basic Wave Analyser and Spectrum Analyser
15th	*1st*		7.4 Function of basic Wave Analyser and Spectrum Analyser
	2nd		7.5 Basic concept of Data Acquisition System (DAS)
	3RD		7.5 Basic concept of Data Acquisition System (DAS)

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