

# Government Polytechnic, Balangir

Department of Department of Electrical Engineering

LESSON PLAN 2026-27(WINTER)

NAME OF THE Faculty : Guest Faculty-3

Subject: TH:3- ELECTRICAL AND ELECTRONIC MEASUREMENTS

Program: Diploma in Electrical Engineering

Semester: 3rd

Total Contact Hours: 45

Total Marks: 100

Assessment: Internal Assessment – 30, End Term – 70

**COURSE OUTCOMES:**

CO1 Explain fundamentals of electrical measurements.

CO2 Measure voltage and current using appropriate instruments.

CO3 Measure electrical power using analog instruments.

CO4 Explain measurement and calibration of energy meters.

CO5 Measure circuit parameters and use CRO and other measuring instruments.

Period	Unit	Topic	Learning Objectives	Activity	Course Outcome	Learning Methodology	Homework
1	I	Introduction to Measurements	Explain significance, units and standards of measurement	Interactive discussion	CO1	Lecture & PPT	Read introduction
2	I	Fundamental Quantities & Standards	Identify SI units and standards	Lecture	CO1	Lecture	Prepare notes
3	I	Classification of Instrument Systems	Classify instrument systems	Discussion	CO1	Interactive	Assignment
4	I	Null & Deflection Instruments	Differentiate null and deflection instruments	Demo	CO1	Lecture	Notes
5	I	Absolute & Secondary Instruments	Explain types of instruments	Lecture	CO1	Lecture	Study topic
6	I	Analog & Digital Instruments	Compare analog and digital instruments	Comparison	CO1	Interactive	Comparison table
7	I	Static & Dynamic Characteristics	Explain characteristics and errors	Numericals	CO1	Problem solving	Problems
8	I	Calibration	Explain calibration procedure	Demonstration	CO1	Demo	Assignment
9	I	Classification of Measuring Instruments	Explain indicating, recording & integrating instruments	Lecture	CO1	Lecture	Notes
10	I	Requirements of Indicating Instruments	Explain essential requirements	Quiz	CO1	Discussion	Revision
11	II	DC Ammeter	Explain construction and working	Demo	CO2	Lecture	Draw diagram
12	II	Multi-range Ammeter & Universal Shunt	Explain range extension	Numericals	CO2	Problem solving	Problems
13	II	DC Voltmeter	Explain construction and working	Lecture	CO2	Lecture	Notes
14	II	Loading Effect & Sensitivity	Explain loading effect	Discussion	CO2	Interactive	Assignment
15	II	AC Voltmeter Half-wave	Explain operation	Demo	CO2	Lecture	Notes
16	II	AC Voltmeter Full-wave	Explain operation	Demo	CO2	Lecture	Assignment
17	II	Current Transformer	Explain CT	Demo	CO2	Interactive	Notes
18	II	Potential Transformer	Explain PT	Lecture	CO2	Lecture	Draw diagram
19	II	Revision	Review Unit II	Quiz	CO2	Discussion	Revision
20	III	PMMC Instrument	Explain PMMC	Demo	CO3	Lecture	Notes
21	III	PMMI Instrument	Explain PMMI	Lecture	CO3	Lecture	Assignment

	II	Comparison of PMMC & PMMI	Compare instruments	Discussion	CO3	Interactive	Table
	III	Dynamometer Wattmeter	Explain working	Demo	CO3	Lecture	Diagram
4	III	Errors & Compensation	Explain errors	Problem solving	CO3	Lecture	Problems
25	III	One Wattmeter Method	Explain power measurement	Lecture	CO3	Interactive	Assignment
26	III	Two Wattmeter Method	Explain three phase power	Numericals	CO3	Problem solving	Problems
27	III	Three Wattmeter Method	Explain measurement	Lecture	CO3	Lecture	Notes
28	III	Power Factor Effect & MDI	Explain PF effect	Discussion	CO3	Interactive	Revision
29	III	Revision	Review Unit III	Quiz	CO3	Discussion	Revision
30	IV	Electronic Energy Meter	Explain construction	Demo	CO4	Lecture	Diagram
31	IV	Three Phase Energy Meter	Explain operation	Lecture	CO4	Lecture	Notes
32	IV	Errors in Energy Meter	Explain errors	Discussion	CO4	Interactive	Assignment
33	IV	Compensation Methods	Explain compensation	Lecture	CO4	Lecture	Notes
34	IV	Calibration of Energy Meter	Explain calibration	Demo	CO4	Demonstration	Assignment
35	IV	Revision	Review Unit IV	Quiz	CO4	Discussion	Revision
36	V	Resistance Measurement	Explain methods	Lecture	CO5	Lecture	Problems
37	V	Inductance Measurement	Explain Anderson bridge	Lecture	CO5	Lecture	Notes
38	V	Capacitance Measurement	Explain Schering bridge	Demo	CO5	Interactive	Diagram
39	V	CRO	Explain CRO	Demo	CO5	ICT	Notes
40	V	Digital Storage Oscilloscope	Explain DSO	PPT	CO5	Lecture	Assignment
41	V	Other Meters	Explain DMM,LCR etc.	Demo	CO5	Activity	Notes
42	V	Signal Generator	Explain block diagram	Lecture	CO5	Lecture	Diagram
43	V	Applications of CRO	Perform measurements	Practice	CO5	Demo	Worksheet
44	V	Comprehensive Revision	Revise syllabus	Discussion	CO1-CO5	Discussion	Revision
45	All	Class Test	Assess learning	Test	CO1-CO5	Assessment	Prepare exam

Signature of Faculty

  
Signature of HOD