NILASAILA INSTITUTE OF SCIENCE & TECHNOLOGY SERGARH-756060, BALASORE (ODISHA)
(Approved by AICTE& affiliated to SCTE&VT, Odisha)

LESSON PLAN

SUBJECT: Th-3 (ELECTRICAL MEASUREMENT & INSTRUMENTION)

Name Of The Faculty :- ER BISWAJIT PARIDA
Branch :- ELECTRICAL ENGINEERING **Semester :- 4TH**
Session :- 2024-25 **Examination :-** 2025 (S)

CHAPTER WISE DISTRIBUTION OF PERIODS

Sl.No.	Name of the chapter as per the Syllabus	No. of Periods as per the Syllabus	No. of periods actually needed
1	MEASURING INSTRUMENTS	5	6
2	ANALOG AMMETERS AND VOLTMETERS	10	11
3	WATTMETERS AND MEASUREMENT OF POWER	8	9
4	ENERGYMETERS AND MEASUREMENT OF ENERGY	8	8
5	MEASUREMENT OF SPEED, FREQUENCY AND POWER FACTOR	7	7
6	MEASUREMENT OF RESISTANCE, INDUCTANCE & CAPACITANCE	8	9
7	SENSORS AND TRANSDUCER	9	10
8	OSCILLOSCOPE	5	5
10	Tutorial	15	15
TOTAL		75	80

Sign of Faculty

Sign of H.O.D.

Discipline: EE	Semester: 4th	**Name of the Teaching Faculty:** Er.Biswajit Parida
		SESSION : 2024-25 **EXAMINATION :** 2025 (S)
Week	**Class Day**	**Theory / Practical Topics**
1st	1st	**1. MEASURING INSTRUMENTS**
		1.1 Define Accuracy, precision, Errors, Resolutions Sensitivity and tolerance.
	2nd	1.2 Classification of measuring instruments. 1.3 Explain Deflecting, controlling and damping arrangements in
	3rd	1.3 Explain Deflecting, controlling and damping arrangements in indicating type of instruments.
	4th	1.3 Explain Deflecting, controlling and damping arrangements in indicating type of instruments.
	5th	Tutorial class
2nd	1st	1.3 Explain Deflecting, controlling and damping arrangements in indicating type of instruments.
	2nd	1.4 Calibration of instruments.
	3rd	**2. ANALOG AMMETERS AND VOLTMETERS** 2.1. Describe Construction, principle of operation, errors, ranges merits and demerits of:
	4th	2.1.1 Moving iron type instruments.
	5th	Tutorial class
3rd	1st	2.1.1 Moving iron type instruments.
	2nd	2.1.2 Permanent magnet moving coil type instrument
	3rd	2.1.2 Permanent magnet moving coil type instrument
	4th	2.1.3 Dynamometer type instruments
	5th	Tutorial class
4th	1st	2.1.3 Dynamometer type instruments
	2nd	2.1.4 Rectifier type instruments
	3rd	2.1.4 Rectifier type instruments
	4th	2.2 Extend the range of instruments by use of shunts and Multipliers.
	5th	Tutorial class

Week	Class Day	Theory / Practical Topics
5th	1st	2.3 Solve Numerical
	2nd	**3. WATTMETERS AND MEASUREMENT OF POWER** 3.1 Describe Construction, principle of working of Dynamometer type wattmeter. (LPF and UPF type)
	3rd	3.1 Describe Construction, principle of working of Dynamometer type wattmeter. (LPF and UPF type)
	4th	3.1 Describe Construction, principle of working of Dynamometer type wattmeter. (LPF and UPF type)
	5th	Tutorial class
6th	1st	3.2 The Errors in Dynamometer type wattmeter and methods of their correction.
	2nd	3.2 The Errors in Dynamometer type wattmeter and methods of their correction.
	3rd	3.2 The Errors in Dynamometer type wattmeter and methods of their correction.
	4th	3.3 Discuss Induction type watt meters.
	5th	Tutorial class
7TH	1st	3.3 Discuss Induction type watt meters.
	2nd	3.3 Discuss Induction type watt meters.
	3rd	**4. ENERGYMETERS AND MEASUREMENT OF ENERGY** 4.1 Introduction .
	4th	4.2 Single Phase Induction type Energy meters – construction, working principle and their compensation & adjustments.
	5th	Tutorial class
8th	1st	4.2 Single Phase Induction type Energy meters – construction, working principle and their compensation & adjustments.
	2nd	4.2 Single Phase Induction type Energy meters – construction, working principle and their compensation & adjustments.
	3rd	4.2 Single Phase Induction type Energy meters – construction, working principle and their compensation & adjustments.
	4th	4.3 Testing of Energy Meters.
	5th	Tutorial class

Week	Class Day	Theory / Practical Topics
9th	1st	4.3 Testing of Energy Meters.
	2nd	4.3 Testing of Energy Meters.
	3rd	**5. MEASUREMENT OF SPEED, FREQUENCY AND POWER FACTOR** 5.1 Tachometers, types and working principles
	4th	5.1 Tachometers, types and working principles
	5th	Tutorial class
10th	1st	5.2 Principle of operation and construction of Mechanical and Electrical resonance Type frequency meters.
	2nd	5.2 Principle of operation and construction of Mechanical and Electrical resonance Type frequency meters.
	3rd	5.3 Principle of operation and working of Dynamometer type single phase and three phase power factor meters.
	4th	5.3 Principle of operation and working of Dynamometer type single phase and three phase power factor meters.
	5th	Tutorial class
11th	1st	5.3 Principle of operation and working of Dynamometer type single phase
	2nd	**6. MEASUREMENT OF RESISTANCE, INDUCTANCE& CAPACITANCE**
	3rd	6.1.1 Measurement of low resistance by potentiometer method. .
	4th	6.1.2 .Measurement of medium resistance by wheat Stone bridge method.
	5th	Tutorial class
12th	1st	6.1.3 Measurement of high resistance by loss of charge method.
	2nd	6.2 Construction, principle of operations of Megger & Earth tester for insulation resistance and earth resistance measurement respectively.
	3rd	6.2 Construction, principle of operations of Megger & Earth tester for insulation resistance and earth resistance measurement respectively.
	4th	6.3 Construction and principles of Multimeter. (Analog and Digital)
	5th	Tutorial class
13th	1st	6.3 Construction and principles of Multimeter. (Analog and Digital)
	2nd	6.4 Measurement of inductance by Maxewell's Bridge method. 6.5 Measurement of capacitance by Schering Bridge method
	3rd	**7. SENSORS AND TRANSDUCER** 7.1. Define Transducer, sensing element or detector element and
	4th	7.2. Classify transducer. Give examples of various class of transducer.
	5th	Tutorial class

Week	Class Day	Theory / Practical Topics
14TH	1st	7.3. Resistive transducer 7.3.1 Linear and angular motion potentiometer.
	2nd	7.3.2 Thermistor and Resistance thermometers.
	3rd	7.3.3 Wire Resistance Strain Gauges 7.4. Inductive Transducer
	4th	7.4.1 Principle of linear variable differential Transformer (LVDT) 7.4.2 Uses of LVDT.
	5th	Tutorial class
15th	1st	7.5. Capacitive Transducer. 7.5.1 General principle of capacitive transducer.
	2nd	7.5.2 Variable area capacitive transducer.
	3rd	7.5.3 Change in distance between plate capacitive transducer.
	4th	7.6. Piezo electric Transducer and Hall Effect Transducer with their applications.
	5th	Tutorial class
16th	1st	**8. OSCILLOSCOPE** 8.1. Principle of operation of Cathode Ray Tube.
	2nd	8.2. Principle of operation of Oscilloscope (with help of block diagram).
	3rd	8.2. Principle of operation of Oscilloscope (with help of block diagram).
	4th	8.3. Measurement of DC Voltage & current.
	5th	8.4. Measurement of AC Voltage, current, phase & frequency.

Sign of Faculty

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