



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



LESSON PLAN

SUBJECT: Th-3 (ELECTRICAL MEASUREMENT & INSTRUMENTATION)

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	5
2	ANALOG AMMETERS AND VOLTMETERS	10	10
3	WATTMETERS AND MEASUREMENT OF POWER	8	8
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	8
7	SENSORS AND TRANSDUCER	9	9
8	OSCILLOSCOPE	5	5
10	Tutorial	15	15
TOTAL		75	75

Discipline: EE	Semester: 4 th	Name of the Teaching Faculty: Er. RANJAN KUMAR PADHI
Week	Class Day	Theory / Practical Topics
1 st	1 st	1. MEASURING INSTRUMENTS 1.1 Define Accuracy, precision, Errors, Resolutions Sensitivity and tolerance.
	2 nd	1.2 Classification of measuring instruments. 1.3 Explain Deflecting, controlling and damping arrangements in
	3 rd	1.3 Explain Deflecting, controlling and damping arrangements in indicating type of instruments.
	4 th	1.3 Explain Deflecting, controlling and damping arrangements in indicating type of instruments.
	5 th	1.4 Calibration of instruments.
2 nd	1 st	2. ANALOG AMMETERS AND VOLTMETERS 2.1. Describe Construction, principle of operation, errors, ranges merits and demerits of:
	2 nd	2.1.1 Moving iron type instruments.
	3 rd	2.1.2 Permanent Magnet Moving coil type instruments.
	4 th	2.1.2 Permanent Magnet Moving coil type instruments.
	5 th	2.1.3 Dynamometer type instruments
3 rd	1 st	2.1.3 Dynamometer type instruments
	2 nd	2.1.4 Rectifier type instruments
	3 rd	2.2 Extend the range of instruments by use of shunts and Multipliers.
	4 th	2.3 Solve Numerical
	5 th	3. WATTMETERS AND MEASUREMENT OF POWER 3.1 Describe Construction, principle of working of Dynamometer type wattmeter. (LPF and UPF type)
	1 st	3.1 Describe Construction, principle of working of Dynamometer type wattmeter. (LPF and UPF type)

4 th	2 nd	3.2 The Errors in Dynamometer type wattmeter and methods of their correction.
	3 rd	3.3 Discuss Induction type watt meters.
	4 th	4. ENERGYMETERS AND MEASUREMENT OF ENERGY 4.1 Introduction .
	5 th	4.2 Single Phase Induction type Energy meters – construction, working principle and their compensation & adjustments.
5 th	1 st	4.2 Single Phase Induction type Energy meters – construction, working principle and their compensation & adjustments.
	2 nd	4.3 Testing of Energy Meters.
	3 rd	5. MEASUREMENT OF SPEED, FREQUENCY AND POWER FACTOR 5.1 Tachometers, types and working principles
	4 th	5.2 Principle of operation and construction of Mechanical and Electrical resonance Type frequency meters.
	5 th	5.3 Principle of operation and working of Dynamometer type single phase and three phase power factor meters.
6 th	1 st	6. MEASUREMENT OF RESISTANCE, INDUCTANCE & CAPACITANCE 6.1 Classification of resistance.
	2 nd	6.1.1 Measurement of low resistance by potentiometer method. .
	3 rd	6.1.2 .Measurement of medium resistance by wheat Stone bridge method.
	4 th	6.1.3 Measurement of high resistance by loss of charge method.
	5 th	6.1.3 Measurement of high resistance by loss of charge method.
7 th	1 st	6.2 Construction, principle of operations of Megger & Earth tester for insulation resistance and earth resistance measurement respectively.
	2 nd	6.2 Construction, principle of operations of Megger & Earth tester for insulation resistance and earth resistance measurement respectively.
	3 rd	6.3 Construction and principles of Multimeter. (Analog and Digital)

	4 th	6.3 Construction and principles of Multimeter. (Analog and Digital)
	5 th	6.4 Measurement of inductance by Maxewell's Bridge method.
8 th	1 st	6.4 Measurement of inductance by Maxewell's Bridge method.
	2 nd	6.5 Measurement of capacitance by Schering Bridge method
	3 rd	6.5 Measurement of capacitance by Schering Bridge method
	4 th	6.5 Measurement of capacitance by Schering Bridge method
	5 th	Tutorial class
9 th	1 st	7. SENSORS AND TRANSDUCER 7.1. Define Transducer, sensing element or detector element and transduction elements
	2 nd	7.1. Define Transducer, sensing element or detector element and transduction elements
	3 rd	7.2. Classify transducer. Give examples of various class of transducer.
	4 th	7.2. Classify transducer. Give examples of various class of transducer.
	5 th	7.3. Resistive transducer
10 th	1 st	7.3. Resistive transducer
	2 nd	7.3.1 Linear and angular motion potentiometer.
	3 rd	7.3.1 Linear and angular motion potentiometer.
	4 th	7.3.2 Thermistor and Resistance thermometers.
	5 th	7.3.2 Thermistor and Resistance thermometers.
11 th	1 st	7.3.3 Wire Resistance Strain Gauges
	2 nd	7.3.3 Wire Resistance Strain Gauges
	3 rd	7.4. Inductive Transducer
	4 th	7.4. Inductive Transducer

	5 th	Tutorial class
12 th	1 st	7.4.1 Principle of linear variable differential Transformer (LVDT)
	2 nd	7.4.1 Principle of linear variable differential Transformer (LVDT)
	3 rd	7.4.1 Principle of linear variable differential Transformer (LVDT)
	4 th	7.4.2 Uses of LVDT.
	5 th	Tutorial class
13 th	1 st	7.5. Capacitive Transducer.
	2 nd	7.5. Capacitive Transducer.
	3 rd	7.5.1 General principle of capacitive transducer.
	4 th	7.5.1 General principle of capacitive transducer.
	5 th	Tutorial class
14 th	1 st	7.5.2 Variable area capacitive transducer.
	2 nd	7.5.2 Variable area capacitive transducer.
	3 rd	7.5.3 Change in distance between plate capacitive transducer.
	4 th	7.5.3 Change in distance between plate capacitive transducer.
	5 th	7.6. Piezo electric Transducer and Hall Effect Transducer with their applications.
15 th	1 st	7.6. Piezo electric Transducer and Hall Effect Transducer with their applications.
	2 nd	8. OSCILLOSCOPE 8.1. Principle of operation of Cathode Ray Tube.
	3 rd	8.2. Principle of operation of Oscilloscope (with help of block diagram).
	4 th	8.3. Measurement of DC Voltage & current.
	5 th	8.4. Measurement of AC Voltage, current, phase & frequency.