Lesson Plan for Electrical Measurement and Instrumentation (Th3)		
Discipline: Electrical Engineering	**Semester: 4th**	**Name of the Teaching Faculty: Sri Subhra Pratik Sahoo (PTGF)**
Subject: Electrical Measurement and Instrumentation	**No. of days per week class allotted: 5**	**Semester From Date : 14/02/2023 to Date: 25/05/2023** **No. of Weeks: 15**
Week	**Class Day**	**Theory**
1st		**1. MEASURING INSTRUMENTS**
	1st	1.1 Define Accuracy, precision, Errors, (cont.)
	2nd	1.1 Define Accuracy, precision, Errors, (cont.)
	3rd	1.1 Define Accuracy, precision, Errors, (cont.)
	4th	Resolutions Sensitivity and tolerance
	5th	Resolutions Sensitivity and tolerance
	1st	1.2 Classification of measuring instruments.
2nd		**2.ANALOG AMMETERS AND VOLTMETERS**
	2nd	2.1. Describe Construction, principle of operation, errors, ranges merits and demerits of:
	3rd	2.1.1 Moving iron type instruments.
	4th	2.1.2 Permanent Magnet Moving coil type instruments.
	5th	2.1.3 Dynamometer type instruments
	1st	2.1.4 Rectifier type instruments
	2nd	2.1.5 Induction type instruments
	3rd	2.2 Extend the range of instruments by use of shunts and Multipliers.
	4th	2.2 Extend the range of instruments by use of shunts and Multipliers.
	5th	2.2 Extend the range of instruments by use of shunts and Multipliers.
4th	1st	2.3 Solve Numerical
	2nd	3.1 Describe Construction, principle of working of Dynamometer type wattmeter. (LPF and UPF type)(cont.)
	3rd	3.1 Describe Construction, principle of working of Dynamometer type wattmeter. (LPF and UPF type)
	4th	3.2 The Errors in Dynamometer type wattmeter .
	5th	Methods of their correction.
5th	1st	3.3 Discuss Induction type watt meters.(cont.)
	2nd	3.3 Discuss Induction type watt meters.
	3rd	Questions and answers session
		4. ENERGYMETERS AND MEASUREMENT OF ENERGY
	4th	4.1 Introduction
	5th	4.2 Single Phase Induction type Energy meters – construction, working principle and their compensation & adjustments.(cont.)
6th	1st	4.2 Single Phase Induction type Energy meters – construction, working principle and their compensation & adjustments.(cont.)

	2nd	4.2 Single Phase Induction type Energy meters – construction, working principle and their compensation & adjustments.
	3rd	4.3 Testing of Energy Meters.(cont.)
	4th	4.3 Testing of Energy Meters.
	5th	Questions and answers session.
	1st	Questions and answers session.
		5. MEASUREMENT OF SPEED, FREQUENCY AND POWER FACTOR
	2nd	5.1 Tachometers, types and working principles(cont.)
	3rd	5.1 Tachometers, types and working principles.
		5.2 Principle of operation and construction of Mechanical and Electrical resonance Type frequency meters.(cont.)
7th	4th	5.2 Principle of operation and construction of Mechanical and Electrical resonance Type frequency meters.(cont.)
	1st	5.3 Principle of operation and working of Dynamometer type single phase and three phase power factor meters(cont.)
	2nd	5.3 Principle of operation and working of Dynamometer type single phase and three phase power factor meters
	3rd	5.3 Principle of operation and working of Dynamometer type single phase and three phase power factor meters
		6. MEASUREMENT OF RESISTANCE, INDUCTANCE& CAPACITANCE
	4th	6.1 Classification of resistance
8th	5th	6.1..1. Measurement of low resistance by potentiometer method. .
	1st	6.1..2. Measurement of medium resistance by wheat Stone bridge method.
	2nd	6.1..3. Measurement of high resistance by loss of charge method.
	3rd	6.2 Construction, principle of operations of Megger & Earth tester for insulation resistance and earth resistance measurement respectively.
	4th	6.2 Construction, principle of operations of Megger & Earth tester for insulation resistance and earth resistance measurement respectively.
9th	5th	6.2 Construction, principle of operations of Megger & Earth tester for insulation resistance and earth resistance measurement respectively.
	1st	6.5 Measurement of capacitance by Schering Bridge method
		7. SENSORS AND TRANSDUCER
	2nd	7.1. Define Transducer, sensing element or detector element and transduction elements.
	3rd	7.1. Define Transducer, sensing element or detector element and transduction elements.
	4th	7.1. Define Transducer, sensing element or detector element and transduction elements.
10th	5th	7.2. Classify transducer. Give examples of various class of transducer.
	1st	7.2. Classify transducer. Give examples of various class of transducer.
	2nd	7.3. Resistive transducer,
	3rd	7.3. Resistive transducer,
	4th	7.3.1 Linear and angular motion potentiometer.
11th	5th	7.3.1 Linear and angular motion potentiometer.
12th	1st	7.3.1 Linear and angular motion potentiometer.

12th	2nd	7.3.2 Thermistor and Resistance thermometers.
	3rd	7.3.2 Thermistor and Resistance thermometers.
	4th	7.3.3 Wire Resistance Strain Gauges
	5th	7.3.3 Wire Resistance Strain Gauges
13th	1st	7.4. Inductive Transducer)
	2nd	7.4.1 Principle of linear variable differential Transformer (LVDT)
	3rd	7.4.1 Principle of linear variable differential Transformer (LVDT)
	4th	7.4.2 Uses of LVDT.
	5th	7.5. Capacitive Transducer.
14th	1st	7.5.1 General principle of capacitive transducer.
	2nd	7.5.1 General principle of capacitive transducer.
	3rd	7.5.2 Variable area capacitive transducer.
	4th	7.5.2 Variable area capacitive transducer.
	5th	7.5.3 Change in distance between plate capacitive transducer.7.6. Piezo electric Transducer and Hall Effect Transducer with their applications.
15th		**8. OSCILLOSCOPE**
	1st	8.1. Principle of operation of Cathode Ray Tube.
	2nd	8.2. Principle of operation of Oscilloscope (with help of block diagram).
	3rd	8.3. Measurement of DC Voltage & current.
	4th	8.4. Measurement of AC Voltage, current, phase & frequency.
	5th	Questions answers session.

Principal

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