

Discipline: EE	Semester: 4th	Name of the Teaching Faculty: MANMATHA BEHERA
Subject: ELECTRICAL MEASUREMENT AND INSTRUMENTATION	No. of Days/per week class allotted: 05	Semester From Date: 16-01-2023 To Date: 07-05-2023 No. of Weeks : 15
Week	Class Day	Theory Topics
1 st	01	Unit 1:MEASURING INSTRUMENTS Define Accuracy, precision, Errors
	02	Define Resolutions, Sensitivity and Tolerance.
	03	Classification of measuring instruments
	04	Explain Deflecting, controlling and damping arrangements in indicating type of INSTRUMENTS
	05	Tutorial
2 nd	01	Calibration of instruments
	02	Unit 2:ANALOG AMMETERS AND VOLTMETERS Describe Construction, principle of operation, errors, ranges merits and demerits of:
	03	1.Attraction type Moving Iron instruments
	04	2.Repulsion type Moving Iron instruments
	05	3.Permanent Magnet Moving coil type instruments
3 rd	05	4.Dynamometer type instruments
	01	5.Rectifier type instruments
	02	6.Induction type instruments
	03	Extend the range of instruments by use of shunts and Multipliers
	04	Extend the range of instruments by use of shunts and Multipliers
4 th	05	Tutorial
	01	Solve Numerical
	02	Unit 3:WATTMETERS AND MEASUREMENT OF POWER Describe Construction of Dynamometer type wattmeter
	03	Describe principle of working of Dynamometer type wattmeter
	04	Types of connections of wattmeters(MC & LC)
5 th	05	Tutorial
	01	Errors in Dynamometer type wattmeter and methods of their correction(Due to MC & LC Connections)
	02	Error due to potential coil self inductance and it's correction
	03	LPF Wattmeters
	04	Discuss Induction type watt meters.

	05	Tutorial
6 th	01	3 phase power measurement by two wattmeters method
	02	Unit 4:ENERGY METERS AND MEASUREMENT OF ENERGY Introduction
	03	Construction of Single Phase Induction type Energy meters
	04	Working principle of Single Phase Induction type Energy meters
	05	Tutorial
7 th	01	Error in Single Phase Induction type Energy meters
	02	Lag Adjustment devices
	03	Creeping Errorr-definition,causes and solution
	04	Energy meter constant,solve numerical
	05	Tutorial
8 th	01	Testing of Energy Meters
	02	Unit 5:MEASUREMENT OF SPEED, FREQUENCY AND POWER FACTOR Tachometers, types and working principles
	03	Construction of Mechanical resonance Type frequency meters.
	04	Principle of operation of Mechanical resonance Type frequency meters
	05	Tutorial
9 th	01	Construction of Electrical resonance Type frequency meters
	02	Principle of operatin of Electrical resonance Type frequency meters
	03	Principle of operation and working of Dynamometer type single phase power factor meters.
	04	Principle of operation and working of Dynamometer type three phase power factor meters
	05	Tutorial
10 th	01	Unit 6:MEASUREMENT OF RESISTANCE, INDUCTANCE& CAPACITANCE DC and AC bridges,Classification of resistances
	02	Measurement of low resistance by potentiometer method.
	03	Measurement of medium resistance by wheat Stone bridge method.
	04	Measurement of high resistance by loss of charge method.
	05	Tutorial
11 th	01	Construction, principle of operations of Megger & Earth tester for insulation resistance and earth resistance measurement respectively
	02	Construction and principles of Multimeter. (Analog and Digital)
	03	Measurement of inductance by Maxewell's Bridge method
	04	Measurement of capacitance by Schering Bridge method
	05	Tutorial

12 th	01	Unit 7:SENSORS AND TRANSDUCER Define Transducer, sensing element or detector element and transduction elements
	02	Classify transducer. Give examples of various class of transducer,Linear and angular motion potentiometer
	03	Thermistor and Resistance thermometers
	04	Wire Resistance Strain Gauges
	05	Tutorial
13 th	01	Principle of linear variable differential Transformer (LVDT),Uses of LVDT
	02	General principle of capacitive transducer
	03	Variable area capacitive transducer
	04	Change in distance between plate capacitive transducer
	05	Tutorial
14 th	01	Piezo electric Transducer and Hall Effect Transducer with their applications
	02	Tutorial
	03	Unit 8:OSCILLOSCOPE Principle of operation of Cathode Ray Tube
	04	Principle of operation of Oscilloscope (with help of block diagram)
	05	Measurement of DC Voltage & current
15 th	01	Measurement of AC Voltage & current
	02	Measurement of phase & frequency.
	03	Tutorial
	04	Revision
	05	Important Questions discussion