Lesson Plan

Name of the Faculty : **Mr. Ashish Kumar Yadav**

Discipline : **Electrical Engineering**

Semester : **3th Semester**

Subject : **ELECTRICAL MEASUREMENT & INSTRUMENTATION**

Lesson Plan Duration : **15 Weeks**

Date	Theory		Practical	
	Lecture Day	**Topic (including assignment / test)**	**Practical Day**	**Topic**
	1	Significance of measurement, errors in measurement, types of error	1	Use of analog and digital multimeter for measurement of voltage, current (A.C/D.C) and resistance
	2	Classification of measuring instruments: indicating, recording, and integrating instruments; Essential requirements of an indicating instruments	2	To measure the value of earth resistance using earth tester.
	3, 4	Concept of Ammeter, voltmeter, ammeter construction, working principle	3	To measure power, power factor in a single-phase circuit, using wattmeter and power factor meter and to verify results with calculations.
	5	Merits, demerits and comparison of moving coil, moving iron meter, rectifier type	4	Measurement of power and power factor of a three- phase balanced load by two wattmeter method.
	6,7	Extension of range and calibration of voltmeter and ammeter, Errors and compensation	5	Measurement of voltage and frequency of a sinusoidal signal using CRO and draw wave shape of signal.
	8	Construction, working principle, merits and demerits of dynamometer wattmeter	6	Measurement of power in a 3-phase circuit using CT, PT and 3-phase wattmeter.
	9, 10	Digital wattmeter, Active and reactive power measurement by , two and three wattmeter method.	7	Use of LCR meter for measuring inductance, capacitance and resistance.
	11, 12	Effect of Power factor on wattmeter reading in two wattmeter method, Maximum Demand indicator	8	To record all electrical quantities from the meters installed in the institution premises
	13, 14, 15	Construction, working principle, merits and demerits of single-phase and three-phase energy meters (Induction type), Errors and their compensations	9	To measure Energy at different Loads using Single Phase Digital Energy meter.

	16	Calibration of energy meter using direct loading	10	Calibration of single phase and three-phase energy meter.
	17	Digital energy meter (diagram, construction and application)	11	Measurement of pressure by using LVDT.
	18, 19, 20	Construction, working principle and application of Meggar, Earth tester (analog and digital), multi- meter (analog and digital), Frequency meter (dynamometer type), single power factor meter (Electrodynamometer type)	12	To measure temperature using a thermo-couple
	21, 22	Working principle of synchroscope and phase sequence indicator, tong tester (Clamp-on meter)	13	Measurement of temperature by using thermister/Thermal Imager.
	23	Study of LCR meters and their applications	14	To measure the strain using electrical strain gauge
	24	Construction, working and applications of CT and PT	15	To measure the pH level using pH meter.
	25, 26	Cathode Ray Oscilloscope: Block diagram, working principle of CRO and its various controls, Digital Storage Oscilloscope (DSO)		
	27	Introduction, Types of Transducers		
	28, 29	Construction and principle of resistive transducer- Potentiometer–variac and strain gauges -No derivation		
	30, 31	Only definition and formula for gauge factor, Types of strain gauges like unbonded, bonded and semiconductor		
	32, 33	Construction and principle of Inductive transducers-L.V.D.T. and R.V.D.T, their applications.		
	34.35	Construction, principle and applications of transducers – Piezoelectric transducer, photo-conductive cells, photo voltaic cells.		
	36, 37, 38	Temperature measurement - Construction and Working of RTD, Thermistor and Thermocouple, radiation pyrometer, technical specifications and ranges. Thermal Imager Camera (Concept)		
	39, 40	Pressure measurement – Construction and working of bourdon tube, bellow diaphragm strain gauge. Measurement of pH Level.		
	41- 45	Revision of important topics		