

LESSON PLAN

Discipline: ELECTRICAL	Subject: ELECTRICAL & ELECTRONICS MEASUREMENT	Name of the teaching faculty: SIBA PRASAD SAMANTARAYA
Semester: SUMMER 2026	No of days/per week class allotted: 3P/ week	Semester duration: 01 JUL 26 To 05 NOV 26 No of weeks:18

WEEK	PERIOD	TOPICS
UNIT I		
1st	1st	Fundamentals of Measurements 1.1 Measurement: Significance, units, fundamental quantities and standards
	2nd	1.2 Classification of Instrument Systems
	3rd	1.3 Null and deflection type instruments
2nd	1st	1.4 Absolute and secondary instruments
	2nd	1.5 Analog and digital instruments
	3rd	1.6 Static and dynamic characteristics, types of errors
3rd	1st	1.7 Calibration: need and procedure
	2nd	1.8 Classification of measuring instruments: indicating, recording and integrating instruments
	3rd	1.9 Essential requirements of an indicating instruments
		UNIT II
4th	1st	Measurement of voltage and current 2.1 DC Ammeter: Basic, Multi range, Universal shunt,
	2nd	2.1 DC Ammeter: Basic, Multi range, Universal shunt,
	3rd	2.2 DC Voltmeter: Basic, Multi-range, concept of loading effect and sensitivity
5th	1st	2.2 DC Voltmeter: Basic, Multi-range, concept of loading effect and sensitivity
	2nd	2.3 AC voltmeter: Rectifier type (half wave and full wave)
	3rd	2.3 AC voltmeter: Rectifier type (half wave and full wave)
6th	1st	2.4 CT and PT: construction, working and applications
	2nd	2.4 CT and PT: construction, working and applications
	3rd	2.4 CT and PT: construction, working and applications
		UNIT III
7th	1st	Measurement of Electric Power 3.1 Analog meters: Permanent magnet moving coil (PMMC) and Permanent magnet moving iron (PMMI) meter, their construction, working, salient features, merits and demerits
	2nd	3.1 Analog meters: Permanent magnet moving coil (PMMC) and Permanent magnet moving iron (PMMI) meter, their construction, working, salient features, merits and demerits
	3rd	3.2 Dynamometer type wattmeter: Construction and working
8th	1st	3.2 Dynamometer type wattmeter: Construction and working
	2nd	3.3 Errors and compensations of PMMI, PMMC and Dynamometer type wattmeter
	3rd	3.3 Errors and compensations of PMMI, PMMC and Dynamometer type wattmeter
9th	1st	3.4 Active and reactive power measurement: One, two and three wattmeter method
	2nd	3.5 Effect of Power factor on wattmeter reading in two wattmeter method
	3rd	3.6 Maximum Demand indicator(Definition only)
		UNIT IV
10th	1st	Measurement of Electric Energy 4.1 Single and three phase electronic energy meter: Constructional features and working principle
	2nd	4.1 Single and three phase electronic energy meter: Constructional features and working principle
	3rd	4.2 Errors and their compensations

11 th	1st	4.2 Errors and their compensations
	2nd	4.3 Calibration of single-phase electronic energy meter using direct loading.
	3rd	4.3 Calibration of single-phase electronic energy meter using direct loading.
UNIT V		
12 th	1st	Circuit Parameter Measurement, CRO and Other Meters
	2nd	5.1 Measurement of resistance
	3rd	5.1.1 Low resistance: Kelvin's double bridge,
	4th	5.1.2 Medium Resistance: Voltmeter and ammeter method
13 th	1st	5.1.3 High resistance: Megger and Ohm meter: Series and shunt
	2nd	5.2 Measurement of inductance using Anderson bridge (no derivation and phasor diagram)
	3rd	5.3 Measurement of capacitance using Schering bridge (no derivation and phasor diagram)
14 th	1st	5.4 Single beam/single trace CRO (Working principle and block diagram only)
	2nd	5.5 Digital storage Oscilloscope: Basic block diagram, working.
	3rd	5.5 Basic block diagram, working of Cathode ray tube and electrostatic deflection.
15 th	1st	5.5 Role of vertical amplifier, time base generator, horizontal amplifier
	2nd	5.5 Measurement of voltage/ amplitude/ time period/ frequency/ phase angle delay line, specifications.
	3rd	5.5 Measurement of voltage/ amplitude/ time period/ frequency/ phase angle delay line, specifications.
16 th	1st	5.6 Other meters: Earth tester, Digital Multimeter; L-C-R meter, Frequency meter (ferromagnetic and Weston type), Phase sequence indicator, power factor meter (single phase and three phase dynamometer type), Synchro scope, Tri-vector meter
	2nd	5.6 Other meters: Earth tester, Digital Multimeter; L-C-R meter, Frequency meter (ferromagnetic and Weston type), Phase sequence indicator, power factor meter (single phase and three phase dynamometer type), Synchro scope, Tri-vector meter
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	2nd	5.6 Other meters: Earth tester, Digital Multimeter; L-C-R meter, Frequency meter (ferromagnetic and Weston type), Phase sequence indicator, power factor meter (single phase and three phase dynamometer type), Synchro scope, Tri-vector meter
	3rd	5.7 Signal generator: need, working and basic block diagram.
18 th	1st	5.7 Signal generator: need, working and basic block diagram.
	2nd	Revision of previous classes.
	3rd	Class test



Siba Prasad Samantaraya
Lect. In ETC Stage I
GP Nayagarh