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## **DEPARTMENT OF ELECTRICAL ENGINEERING** **Govt. Polytechnic, Balasore**


### **LESSON PLAN FOR ACADEMIC SESSION - 2025-26** **ELECTRICAL AND ELECTRONICS MEASUREMENT**


<b>Course Code : Th-3</b>	<b>Semester : 3RD</b>
<b>Total Periods : 45 Hrs</b>	<b>Examination : 3 Hours</b>
<b>Theory Periods : 3P/Week</b>	<b>Progressive Assessment : 30 Marks</b>
<b>End Semester Examination : 70 Marks</b>	
<b>Maximum Marks : 100</b>	
<b>Semester From Date : 14/07/2025</b>	<b>To Date :</b>
<b>Name of Teaching Faculty: Er. Anita Shial</b>	

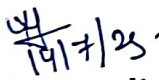
<b>WEEK</b>	<b>PERIOD</b>	<b>TOPIC</b>
1 <sup>st</sup>	1 <sup>st</sup>	<b>Measurement:</b> Significance, units, fundamental quantities and standards
	2 <sup>nd</sup>	Classification of Instrument Systems
	3 <sup>rd</sup>	Null and deflection type instruments
2 <sup>nd</sup>	1 <sup>st</sup>	Absolute and secondary instruments
	2 <sup>nd</sup>	Analog and digital instruments
	3 <sup>rd</sup>	Static and dynamic characteristics, types of errors
3 <sup>rd</sup>	1 <sup>st</sup>	types of errors.
	2 <sup>nd</sup>	Calibration: need and procedure
	3 <sup>rd</sup>	Classification of measuring instruments: indicating, recording and integrating instruments
4 <sup>th</sup>	1 <sup>st</sup>	Essential requirements of an indicating instruments
	2 <sup>nd</sup>	<b>Measurement of voltage and current</b> DC Ammeter: Basic, Multi range
	3 <sup>rd</sup>	Multi range
5 <sup>th</sup>	1 <sup>st</sup>	Universal shunt
	2 <sup>nd</sup>	DC Voltmeter: Basic, Multi-range
	3 <sup>rd</sup>	concept of loading effect and sensitivity


6 <sup>th</sup>	1 <sup>st</sup>	AC voltmeter: Rectifier type. (half wave)
	2 <sup>nd</sup>	AC voltmeter: Rectifier type (full wave)
	3 <sup>rd</sup>	CT :construction, working and applications,
7 <sup>th</sup>	1 <sup>st</sup>	PT: construction, working and applications
	2 <sup>nd</sup>	<b>Measurement of Electric Power</b> Analog meters: Permanent magnet moving coil (PMMC) construction, working, salient features, merits and demerits
	3 <sup>rd</sup>	Permanent magnet moving iron (PMMI) meter, their construction, working, salient features, merits and demerits
8 <sup>th</sup>	1 <sup>st</sup>	Dynamometer type wattmeter: Construction and working
	2 <sup>nd</sup>	Errors and compensations of PMMI, PMMC
	3 <sup>rd</sup>	Errors and compensations of Dynamometer type wattmeter
9 <sup>th</sup>	1 <sup>st</sup>	Active and reactive power measurement: One, two wattmeter method
	2 <sup>nd</sup>	Active and reactive power measurement three wattmeter method
	3 <sup>rd</sup>	Effect of Power factor on wattmeter reading in two wattmeter method
10 <sup>th</sup>	1 <sup>st</sup>	Maximum Demand indicator(Definition only)
	2 <sup>nd</sup>	<b>Measurement of Electric Energy</b> Single phase electronic energy meter: Constructional feature
	3 <sup>rd</sup>	Single phase electronic energy meter working principle
11 <sup>th</sup>	1 <sup>st</sup>	three phase electronic energy meter: Constructional features
	2 <sup>nd</sup>	three phase electronic energy meter working principle
	3 <sup>rd</sup>	Errors
12 <sup>th</sup>	1 <sup>st</sup>	compensations
	2 <sup>nd</sup>	Calibration of single-phase electronic energy meter using direct loading.
	3 <sup>rd</sup>	<b>Circuit Parameter Measurement, CRO and Other Meters</b> Measurement of resistance : Low resistance: Kelvin's double bridge
13 <sup>th</sup>	1 <sup>st</sup>	Medium Resistance: Voltmeter and ammeter method
	2 <sup>nd</sup>	High resistance: Megger and Ohm meter: Series and shunt

	3 <sup>rd</sup>	Measurement of inductance using Anderson bridge (no derivation and phasor diagram)
14 <sup>th</sup>	1 <sup>st</sup>	Measurement of capacitance using Schering bridge (no derivation and phasor diagram)
	2 <sup>nd</sup>	Single beam/single trace CRO (Working principle and block diagram only) Digital storage Oscilloscope: Basic block diagram, working, Cathode ray tube, electrostatic deflection,
	3 <sup>rd</sup>	vertical amplifier, time base generator, horizontal amplifier, Measurement of voltage/ amplitude/ time period/ frequency/ phase angle delay line, specifications.
15 <sup>th</sup>	1 <sup>st</sup>	Earth tester, Digital Multimeter; L-C-R meter
	2 <sup>nd</sup>	Frequency meter (ferromagnetic and Weston type), Phase sequence indicator
	3 <sup>rd</sup>	power factor meter (single phase and three phase dynamometer type), Synchro scope, Tri-vector meter Signal generator: need, working and basic block diagram.

  
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