



# GOVERNMENT POLYTECHNIC, BALASORE

Government of Odisha

ସରକାରୀ ବହୁବୃତ୍ତି ଅନୁଷ୍ଠାନ, ବାଲେଶ୍ଵର

ACADEMIC LESSON PLAN FOR WINTER SEMESTER - 2024

DEPT. OF ELECTRONICS & TELECOMMUNICATION, GOVT. POLYTECHNIC, BALASORE

NAME OF THE FACULTY: JADUNATH MURMU (SR. LECTURER, E&TC)

TH.4: ELECTRONICS MEASUREMENT & INSTRUMENTATION

<b>DISCIPLINE:</b> ELECTRONICS & TELECOMMUNICATION ENGINEERING	<b>SEMESTER:</b> 3RD	<b>NAME OF THE TEACHING FACULTY:</b> JADUNATH MURMU
<b>SUBJECT:</b> Electronics Measurement & Instrumentation	<b>NO. OF DAYS/PER WEEK CLASS ALLOTTED:</b> 4	<b>SEMESTER FROM DATE:</b> 1 <sup>ST</sup> JULY 2024 <b>TO DATE:</b> <b>NO. OF WEEKS:</b> 15
<b>WEEK</b>	<b>CLASS DAY</b>	<b>THEORY TOPICS</b>
1 <sup>ST</sup>	1 <sup>ST</sup>	<b>Unit-1: Qualities of Measurement(05)</b> 1.1 Discuss the Static Characteristics,
	2 <sup>ND</sup>	1.2 Accuracy, sensitivity, reproducibility,static error of instruments
	3 <sup>RD</sup>	1.3 Dynamic characteristics& speed of instruments.
	4 <sup>TH</sup>	1.4 Errors of an instrument & explain various types.
2 <sup>ND</sup>	1 <sup>ST</sup>	1.4 Errors of an instrument & explain various types.
	2 <sup>ND</sup>	<b>Unit-2: Indicating Instruments (10)</b> 2.1 Introduction to Indicator & Display devices & its types
	3 <sup>RD</sup>	2.2 Basic principle of meter movement, permanent magnetic moving coil movement & its advantages & disadvantages.
3 <sup>RD</sup>	4 <sup>TH</sup>	2.3 Operation of Moving Iron Instrument
	1 <sup>ST</sup>	2.4 Basic principle of operation of DC Ammeter and Multi range Ammeter
	2 <sup>ND</sup>	2.5 Basic principle of operation of AC Ammeter and Multi range Ammeter
	3 <sup>RD</sup>	2.6 Basic principle of operation of DC Voltmeter and its applications
4 <sup>TH</sup>	4 <sup>TH</sup>	2.7 Basic principle of operation of AC Voltmeter and its application
	1 <sup>ST</sup>	2.8 Basic principle of Ohm Meter (Series & Shunt type)
	2 <sup>ND</sup>	2.9 Basic principle of Analog Multimeter, its types & applications
	3 <sup>RD</sup>	2.10 Operation of Q meter and its essentials
5 <sup>TH</sup>	4 <sup>TH</sup>	<b>Unit-3: Digital Instruments(10)</b> 3.1 Principle of operation of Ramp type Digital Voltmeter & applications
	1 <sup>ST</sup>	3.2 Operation of display of 3 1/2, 4 1/2- Digital Multimeter & Resolution and Sensitivity
	2 <sup>ND</sup>	3.3 Basic principle of operation of working of Digital Multimeterits types & applications
	3 <sup>RD</sup>	3.4 Basic principle of operation of working of Digital Frequency Meter
	4 <sup>TH</sup>	3.5 Operation of working of Digital Measurement of Time
6 <sup>TH</sup>	1 <sup>ST</sup>	3.6 Measurement of Frequency.
	2 <sup>ND</sup>	3.7 Principle of operation of working of Digital Tachometer
	3 <sup>RD</sup>	3.8 Principle of operation of working of Automation in Digital Instruments
	4 <sup>TH</sup>	Polarity Indication, Ranging, Zeroing & Fully Automatic
7 <sup>TH</sup>	1 <sup>ST</sup>	3.9 Block diagram of LCR meter & its working principle.
	2 <sup>ND</sup>	<b>Unit-4: Oscilloscope(08)</b> 4.1 Basic principle of Oscilloscope& its Block Diagram

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8 <sup>TH</sup>	3 <sup>RD</sup>	4.2 Basic principle & Block diagram of CRO,
	4 <sup>TH</sup>	Dual Trace Oscilloscope & its specification
	1 <sup>ST</sup>	4.3 CRO Measurements,
	2 <sup>ND</sup>	Lissajous figures
9 <sup>TH</sup>	3 <sup>RD</sup>	4.4 Applications of Oscilloscope (Voltage period & frequency measurement)
	4 <sup>TH</sup>	4.5 Operation of Digital Storage Oscilloscope
	1 <sup>ST</sup>	High frequency Oscilloscope
10 <sup>TH</sup>	2 <sup>ND</sup>	<b>Unit-5: Bridges (11)</b>
	3 <sup>RD</sup>	5.1 Types of Bridges ( DC & Ac Bridges)
	4 <sup>TH</sup>	5.2 DC Bridges (Measurement of Resistance by Wheatstone's Bridge)
	1 <sup>ST</sup>	5.2 DC Bridges (Measurement of Resistance by Wheatstone's Bridge)
11 <sup>TH</sup>	2 <sup>ND</sup>	5.3 AC bridges (Measurement of inductance by Maxwell's Bridge)
	3 <sup>RD</sup>	5.3 AC bridges (Measurement of inductance by Hay's Bridge)
	4 <sup>TH</sup>	5.4 Measurement of capacitance by Schering's Bridge, Desauty Bridge.
12 <sup>TH</sup>	1 <sup>ST</sup>	5.5 Working principle of Q meter its circuit diagram
	2 <sup>ND</sup>	Measurement of Low impedance
	3 <sup>RD</sup>	5.6 Measurement of frequency
	4 <sup>TH</sup>	5.7 LCR Meter & its measurements
13 <sup>TH</sup>	1 <sup>ST</sup>	<b>Unit-6: Transducers &amp; Sensors(11)</b>
	2 <sup>ND</sup>	6.1 Parameter, method of Selecting
	3 <sup>RD</sup>	Advantage of Electrical Transducer & Resistive Transducer
	4 <sup>TH</sup>	6.2 Working principle of Strain Gauges, define Strain Gauge
14 <sup>th</sup>	1 <sup>ST</sup>	6.3 Working principle of LVDT
	2 <sup>ND</sup>	6.3 Working principle of LVDT
	3 <sup>RD</sup>	6.4 Working principle of capacitive transducers (pressure)
	4 <sup>TH</sup>	6.5 Working principle of Load Cell (Pressure Cell)
15 <sup>TH</sup>	1 <sup>ST</sup>	6.6 Working principle of Temperature Transducer :RTD, Optical Pyrometer
	2 <sup>ND</sup>	Thermocouple, Thermister
	3 <sup>RD</sup>	6.7 Working principle of Current transducer and KW Transducer
	4 <sup>TH</sup>	6.8 Working principle of Proximity & Light sensors.
15 <sup>TH</sup>	1 <sup>ST</sup>	<b>Unit-7: Signal Generator, Wave Analyser &amp; DAS (05)</b>
	2 <sup>ND</sup>	7.1 General aspect & classification of Signal generators
	3 <sup>RD</sup>	7.2 Working principle of AF Sine & Square wave generator .
	4 <sup>TH</sup>	7.3 Working principle of the Function Generator
	4 <sup>TH</sup>	7.4 Function of basic Wave Analyser & Spectrum Analyser
		7.5 Basic concept of Data Acquisition System (DAS)

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Faculty

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H.O.D

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Principal