GOVERNMENT CO.ED POLYTECHNIC RAIPUR (C.G)

DEPARTMENT OF ELECTRICAL ENGINEERING

LESSON PLAN

Session: NOV-DEC 2022

Session start as per university calendar:

Course Name: Instrumentation & Process Control

Name of Subject Teacher:

Lecturer plan T+P = 4

Course code: 2024573(025)

Discipline: EE, EEE		**Semester: 5th**			**Class room Instruction Start Date: 29/09/2022**				
S.No.	**Chapter No.**	**Topics**	**Sub Topic to be covered under this unit**	**Total hours**	**No. of periods planned**	**Actual No of periods taken**	**Date of Class Conduction**	**Use of AV resources if any**	**Remarks if any**
1	1	*Basic Instrumentation System and characteristics*	Need of instrumentation.	12				NA	
			Block diagram of a generalized instrumentation system and their functions						
			Characteristics of an instrumentation system						
			Static characteristics - Accuracy, precision, error, resolution, linearity, reproducibility,						
2	2	*Transducers*	Concepts, importance and characteristics	20				NA	
			Sensors and transducers.						
			Classification of transducers based on: Energy – Active and passive. Technology Mechanical, Electrical, Electronic.						
			Construction, Bourdon tube LVDT Strain Gauge Thermocouple, Resistance Temperature Detector(RTD), Thermistor						
3	3	*Signal conditioning and data transmission*	Signal conditioning- Purpose, Elements	16				NA	
			Operational Amplifier, instrumentation Amplifier, Applications.						
			Sample and Hold of a signal, Shannon criteria, Quantization						
			Data transmission- Advantages and disadvantages of Digital Transmission over Analog						
4	4	*Measurement of Non-Electrical quantities*	Measurement of Temperature- using Thermocouple, RTD	14				NA	
			Measurement of Pressureusing Pirani Gauge, LVDT						
			Measurement of speed – using Tachometer, Stroboscope						
			Material Analysis- Measurement of pH, Humidity,						
			Measurement of Flow – using electromagnetic pick-up, turbine flow meter.						
			Measurement of position, object detection using proximity transducers						
			Measurement of liquid level – using capacitive transducer.						
5	5	*Basic Control System*	Concept of System, representation in ''s'' domain, Laplace transform,	12				NA	
			Concept of system stability based on location of poles and zeroes						
			Basic control actions – Proportional (P), Integral (I) and Differential (D), PID Controller.						
			Use of sensors and transducers in feedback control system.						
				74 Hours					