1. **Name of the Institute** **GOVT CO-ED POLYTECHNIC, RAIPUR**
2. **Name of the department** Electrical Engineering
3. **Name of the Teacher**
4. **Title of the course** **Electrical and Electronics Measurement**
5. **Course Code**
6. **Credits** **5**

Course Outcomes (Cos)	**CO-1 Select appropriate measuring instrument for a given application**
	CO-2 Use electromechanical instruments for measurements.
	CO-3 Measure circuit components using appropriate Bridge/ meter
	CO-4 Trouble shoots basic electronic instruments used for industrial applications
	CO-5 Use Cathode Ray Oscilloscope and Digital Storage Oscilloscope for measurements

Session: **Semester: Third** **Class room instruction start Date:**

Session Outcomes	Class room instruction topics	No. of periods planned	Actual number of periods taken	Remarks
UNIT 1: Basics of measurements and measuring instruments **SO 1.1** Explain basic concept of measurements	Basics concepts and importance of measurement system	2		
	Characteristics of measuring system..	1		
	accuracy, precision, Error, resolution, sensitivity& tolerance	1		
	Tutorial No 1	1		
SO 1.2 Explain terms related to measuring system	Types of measuring system and its Typical uses	1		
	Production of deflecting,controlling and Damping torques.	1		
SO 1.3 Construction and working of electro mechanical measuring instruments	Construction ,working & torque derivation of PMMC	1		
	Construction ,working & torque derivation of Moving iron	1		
	Construction,Working of Induction type instrument	2		
	Construction,Working of Dynamometer type instruments	2		
	Tutorial No 2	1		
UNIT 2: Electricalmechanical measuring	Basic of current,voltage. Galvanometer, Ammeter, Voltmeter	2		

instruments **SO 2.1** Explain the general principle of measuring current, voltage , power and energy in electrical system.	Range Extension of ammeter and voltmeter using i.shunts and multipliers current. ii. current transformer and potential transformer	1		
	Tutorial No 3	1		
SO 2.2 Explain the Working of measuring single and three phase power and energymeter in an measuring system**.**	Measurement of single phase and three phase power using wattmeter.	2		
	Calibration of ammeters, voltmeters, wattmeters and enegrymeters.	1		
	Working of Digital energy meter.	1		
	Tutorial No 4	1		
		1		
		1		
UNIT 3: Measurements using Bridges / meters. **SO 3.1** Explain the concept of balancing Bridges**.**	Classification of resistance. Bridge balancing concept.	2		
	Wheat stone bridge: Working, contruction and derivation of unkown resistance	1		
	Kelvin's Double bridge: Working, contruction	1		
	High resistance and earth resistance measurement using megger & earth tester	1		
	Tutorial No 5	1		
SO 3.2 Describe the working of AC Bridges	Inductance Measurement using Maxwell's Bridge	1		
	Capacitance Measurement: Schering Bridge	1		
	Tutorial No 6	1		
UNIT 4: Electronic instruments **SO 4.1**. Explain	Basic concept ,Essentials and advantages of electronic instruments	2		
	True RMS reading and voltmeter;	2		

the importance and significance of using electronic instruments	Working and construction			
	Digital voltmeter and its types: Working and construction	2		
	Tutorial No 7	1		
SO 4.2 Describe working and advantage of digital multi meter.	Digital multimeter: Construction and working.	2		
SO 4.3 Describe the working of LCR meter.	LCR multimeter: Construction and working	2		
		1		
	Tutorial No 8	1		
SO 4.4 Explain the working of analog/digital recorders.	Analog/Digital recorders, Graphic recorder, Strip recorder, XY recorder,	2		
		1		
UNIT 5: Cathode Ray Oscilloscope and Digital Storage Oscilloscope **SO 5.**1Describe functions of basic building block of CRO	CRO-basic clock diagram, Cathode Ray Tube, Electrostatic and magnetic deflection	2		
	Controls on CRO and their functions, Lissajous pattern	2		
SO 5.2 Explain working of digital storage oscilloscope using block diagram**.**	Digital Storage Oscilloscope- Basic block diagram and working.	2		
	Tutorial No 8	1		
		1		
		1		

Total number of classes actually taken:

Class room instruction End Date:

HOD

(Department of Electrical)