

The Maharaja Sayajirao University of Baroda Polytechnic Diploma in Electronics & Communication Engg. (HPP)			ACADEMIC YEAR 2022-23		
Year	II	ELECTRONICS INSTRUMENTS AND MEASUREMENTS (ELE3433)	Lecture/Lab Hrs per week	4/2	
Semester	II		Max marks	100	
Pre-Requisite: Basic Mathematics, Basic Electronics					
CO1	Explain accuracy, precision, error types, probability of error, limiting errors, and basic instrument elements.				
CO2	Compare PMMC, MI, dynamometer, induction-type, and rectifier-type instruments.				
CO3	Analyze Wheatstone, Kelvin, and AC bridges (Maxwell, Hay, Schering, Wien) and their balance conditions.				
CO4	Evaluate AC voltmeters, electronic multimeters, digital voltmeters, and digital display systems.				
CO5	Describe oscilloscope operation—CRT, deflection systems, delay line, multi-trace features—and the basics of data loggers and IEEE bus protocols.				
BT	1. Remember 2. Understand 3. Application 4. Analysis 5. Evaluation 6. Creation				
COURSE CONTENT/SYLLABUS					
Unit	Unit Name		Hrs	Weightage	CO
1	Accuracy and precision, Types of errors, statistical, Probability of errors, Limiting errors. Functional elements of an instrument,		4	8	CO1
2	PMMC, MI, Dynamometer, Induction type , Rectifier type Instruments		10	21	CO2
3	Wheatstone bridge : Basic operation, Kelvin bridge: Effects of connecting leads, Kelvin double Bridge. AC Bridges and their application: Condition and application of the balance equation. Maxwell's bridge, Hay Bridge, Schering Bridge, Wein Bridge		15	25	CO3
4	AC voltmeter using rectifiers ,Electronic multi-meter, Digital voltmeters, Digital display,		8	15	CO4
5	Oscilloscope : Introduction, Oscilloscope block Diagram, Cathode Ray tube (CRT), CRT circuits, Deflection systems, Delay line. Multiple trace ,		12	23	CO5
6	Data logger, IEEE Bus standards: Principles of operation, protocols.		4	8	CO5
			53	100	
REFERENCE BOOKS:					
1.	Modern Electronic Instrumentation and Measurement Techniques By Albert.D. Helfrick and William. D. Cooper, Pearson education				
2.	Electronic Instrumentation By H. S. Kalsi, Tata McGraw Hill Publishing Company Ltd				
3.	A Course in Electrical and Electronic Measurements and Instrumentation By A.K.Sawhney Dhanapat Rai & Sons				