

<b>Semester:4TH</b>		<b>Year: 2ND</b>	<b>Course: B.Tech</b>
<b>Branch : EEE</b>		<b>Sub: ELECTRICAL MEASUREMENT AND INSTRUMENTATION</b>	<b>Total Credit:03</b>
		<b>Sub Code : EEPC2004</b>	
<b>Name of the Faculty:</b>		<b>PURUSOTTAM PRADHAN</b>	
<b>Designation :</b>		<b>LECTURER</b>	
<b>Department :</b>		<b>EEE</b>	
<b>Session</b>		<b>2024-25</b>	
<b>Recommended Books</b>		<b>Text book:</b>	
		1. A Course in Electrical and Electronic Measurements and Instrumentation – A K Sawhney – Dhanpat Rai & Co.	
		2. Modern Electronic Instrumentation and Measurement Techniques – Helfrick& Cooper – Pearson Education	
		<b>Reference Books:</b>	
		1.Electrical Measurements and Measuring Instruments – Golding &Widdis – 5th Edition, Reem Publication	
		2.Electronic Instrumentation – H C Kalsi – 2nd Edition, Tata Mcgraw Hill	
		3. Electronic Measurement and Instrumentation – Oliver & Cage – Tata Mcgraw Hill	
<b>Sl. No.</b>	<b>Lecture No.</b>	<b>Topics to be covered</b>	<b>No. of Classes</b>
<b>MODULE-1</b>			
1	Lecture-01	Measurement and Error:Definition, Accuracy and Precision, Significant Figures, Types of Errors. Standards of Measurement:Classification of Standards, Electrical Standards, IEEE Standards	<b>8</b>
2	Lecture-02	Measuring instruments: Absolute and secondary instrument, indicating and recording instrument.	
3	Lecture-03	Types Of Measuring Instrument: Ammeter and Voltmeter: Derivation for Deflecting Torque of; PMMC, MI (Attraction and Repulsion Types),	
4	Lecture-04	Electro Dynamometer and Induction Type Ammeters and Voltmeters.	
5	Lecture-05	Energy Meters and Wattmeter. Construction, Theory and Principle of Operation of Electro-Dynamometer	
6	Lecture-06	Induction Type Wattmeter, Compensation, Creep, Error, Testing, Single Phase	
7	Lecture-07	Polyphase Induction Type Watt-Hour Meters. Frequency Meters: Vibrating Reed Type,	
8	Lecture-08	Electrical Resonance Type, Power Factor Meters.	
<b>MODULE-2</b>			
9	Lecture-09	Measurement of Resistance, Inductance And Capacitance	<b>8</b>
10	Lecture-10	Resistance: Measurement of Low Resistance by Kelvin’s Double Bridge, Measurement of Medium Resistance, Measurement of High Resistance,	
11	Lecture-11	Portable Resistance Testing Set (Megohmmeter), Measurement of Resistance of Earth Connections	
12	Lecture-12	Inductance: Measurement of Self Inductance by Ammeter And Voltmeter, and AC Bridges (Maxwell’s, Hay’s, & Anderson Bridge),	
13	Lecture-13	Measurement of Mutual Inductance by Felici’s Method, and as Self Inductance.	
14	Lecture-14	Capacitance: Measurement of Capacitance by Ammeter and Voltmeter, and AC Bridges (Owen’s, Schering &Wien’s Bridge), Screening of Bridge Components and WagnorEarthing Device.	
15	Lecture-15	Transducer: Strain Gauges, Thermistors, Thermocouples, Linear Variable Differential Transformer	
16	Lecture-16	(LVDT), Capacitive Transducers, Peizo-Electric transducers, Optical Transducer, Hall Effect Transducer.	

MODULE-3			
17	Lecture-17	Galvanometer: Construction, Theory and Principle of Operation of D'Arsonval, Vibration (Moving Magnet & Moving Coil Types),	6
18	Lecture-18	Ballistic Galvanometer, Influence of Resistance on Damping, Logarithmic Decrement,	
19	Lecture-19	Calibration of Galvanometers, Galvanometer Constants.	
20	Lecture-20	Potentiometer: Construction, Theory and Principle	
21	Lecture-21	Operation of DC Potentiometers (Crompton, Vernier, Constant Resistance, & Deflection Potentiometer),	
22	Lecture-22	AC Potentiometers (Drysdale-Tinsley & Gall-Tinsley Potentiometer).	
MODULE-4			
23	Lecture-23	Instrument Transformers: Potential and current transformers,	6
24	Lecture-24	ratio and phase angle errors, phasor diagram, methods of minimizing errors	
25	Lecture-25	Electronic Instruments for Measuring Basic Parameters	
26	Lecture-26	Amplified DC Meters, AC Voltmeters Using Rectifiers, True RMS Voltmeter,	
27	Lecture-27	Digital Multi-meter & Digital Frequency meter	
28	Lecture-28	(Block diagram, principle of operation)	
MODULE-4			
29	Lecture-29	Oscilloscope: Block Diagrams, Delay Line, Multiple Trace, Oscilloscope Probes, Oscilloscope Techniques, Introduction to Analog and Digital Storage	2
30	Lecture-30	Oscilloscopes, Measurement of Frequency, Phase Angle, and Time Delay Using Oscilloscope.	

Signature of Faculty Member

Signature of HOD

PRINCIPAL