EE-504: Electrical Measurement

Credit	L	T	P
3	**2**	**1**	**-**

UNIT-I
Units, dimensions, classification of errors, accuracy and precision, statistical analysis of errors, standards for measurement, temperature, emf, resistance, current, inductance, capacitance. Methods of measurements. Classification of instruments- absolute, secondary, indicating, recording, integrating.

UNIT-II
Instruments for voltage and current measurement, control, balancing and damping forces of instruments, D Arsonval galvanometer- construction and operation, PMMC (Permanent magnet moving coil), moving iron, dynamometer type instruments. Electrostatic and induction type instruments. Use of rectifier for measuring instruments.

UNIT-III
Extension of range of voltmeter and ammeter. Current transformer (CT) and Potential transformer (PT) - theory, ratio and phase angle error, design considerations, characteristics, effect of power factor, secondary burden. Industrial current sensors (Hall Effect).

UNIT-IV
Power in ac circuits, construction and operation of dynamometer and induction type wattmeter. Measurement of power using wattmeter for single phase circuits and three phase circuits. Measurement of reactive power (CT and PT).

UNIT-V
Measurement of energy- single phase induction type watt-hour meter and clock meters. Polyphase watt-hour meters. Ac energy meter testing. Meters for special purposes- prepayment meters, maximum demand indicator, power factor meter, frequency meter and synchroscope.

TEXT/REFFERENCE BOOKS

1. W D Cooper, A D Helfric, “Electronic Instruments and Measurements”, Prentice Hall of India, New Delhi.
2. E W Golding and F C Widdis, “ Electrical Measurements and Measuring Instruments”, JOBS Publications.
3. A.K.Sawhney, “A Course in Electrical and Electronic Instruments and Measurements”, Dhanpat Rai and Sons, Delhi.