

LNCT University
Diploma EX, III Semester Syllabus

ELECTRICAL INSTRUMENTS & MEASUREMENT (DEX-302)

COURSE OUTCOMES:

After Completing the course student should be able to:

CO-1	Recognize the units and standards in Measurements, Classification of Instruments.
CO-2	Identify the various Measuring Instruments that are used in Electrical Measurements.
CO-3	Identify the different Energy meters and power measurement methods.
CO-4	Classification and different methods of resistance measurement.
CO-5	Classification and different bridges for measurement of Inductance and Capacitance.

COURSE CONTENTS

UNIT I: CLASSIFICATION OF MEASURING INSTRUMENTS

Indicating, recording and integrating types of meters. Errors and types of errors, accuracy, precision and sensitivity.

UNIT II: ELECTRICAL MEASURING INSTRUMENTS

Construction and operation. deflecting, controlling and damping forces, supporting systems, moving coil, electro-dynamometer, moving iron and induction type instruments, numerical. Hot wire type instruments, vibration galvanometer, shunt and multipliers, CT & PT.

UNIT III: WATTMETER AND ENERGY METERS

Dynamometer and Induction type wattmeter, Induction type energy meters. Measurement of 1-phase and 3-phase power in balanced and unbalanced load condition, 3 phases wattmeter.

UNIT IV: MEASUREMENT OF RESISTANCE

Classification of resistance, measurement of low, medium and high resistance. Kelvin's double bridge, wheat-stone bridge. Ammeter voltmeter method and ohmmeter, multimeter, megger. Importance of earth resistance, Earth tester.

UNIT V: A C BRIDGES

Measurement of inductance and capacitance by A.C. bridges. Maxwell, Anderson, Hays, Desauty and Wien's bridge, Optics and optical instruments, Electrostatics and electromagnetic induction, Modern physics, basic electronics:

Reference Books: -

1. Electrical Measurement & Measuring Instruments, E W Golding & FC Widdis.
2. Electrical & Electronic Measurements & Instrument, A.K. Sawhney.
3. Electrical Measurements, Buckingham & Price.

List of suggestive core experiments: -

1. Calibration and Testing of single phase energy Meter.
2. Measurement of tolerance of batch of low resistances by Kelvin's double bridge.
3. Measurement of voltage, current and resistance using DC potentiometer.
4. Schering Bridge and Anderson bridge.
5. Measurement of parameters of a choke coil using 3 voltmeter and 3 ammeter methods.
6. Calibration of LPF wattmeter by Phantom testing.
7. Calibration of dynamometer type power factor meter.
8. Measurement of reactive power using single wattmeter in three-phase circuit.