

3rd SEMESTER
SKILL ENHANCEMENT COURSE (SEC)

PHY322S: ELECTRICAL CIRCUITS AND NETWORK SKILLS

(Credits: Theory: 02, Practical: 02)

THEORY (2 CREDITS)

UNIT-I

Basic Electricity Principles: Voltage. Current, Resistance and Power. Ohm's law. Series. Parallel and series-parallel combinations. AC Electricity and DC Electricity. Familiarization with multimeter, voltmeter and ammeter. Understanding Electrical Circuits: Main electric circuit elements and their combination. Rules to analyze DC sourced electrical circuits. Current and voltage drop across the DC circuit elements.

UNIT-II

Generators and Transformers: DC Power sources. AC/DC generators. Inductance. /capacitance, and impedance. Operation of transformers. Electric Motors: Single phase, three—phase & DC motors. Basic design. Interfacing DC or AC sources to control heaters & motors. Speed & power of ac motors. Solid-State Devices: Resistors, inductors capacitors. Diode and rectifiers. Components in Series or in shunt. Response of inductors and capacitors with DC or AC sources. Electrical Protection: Relays. Fuses and disconnect switches. Circuit breakers.

PRACTICAL (2 CREDITS):

- 1) Fabrication of Half Wave rectifier.
- 2) Fabrication of Full wave rectifier.
- 3) Working of Capacitors and Inductors for Voltage regulation.
- 4) Study Zener Diode as Voltage regulator.
- 5) Demonstration of Electrical Dynamo.
- 6) Demonstration and working of Step-up and Step-down transformers.
- 7) Demonstration and working of Invertors and UPS setup.
- 8) Demonstration, Working and Management of Chargeable 6 Volt/12 Volt electrical batteries.
- 9) Demonstration, working & management of Household Appliances like Electric Iron, Oven, Refrigerators etc.
- 10) Study of Electrical Grounding and Electrical Earthing circuits.
- 11) Study of Power Distribution Networks.
- 12) Demonstration of Electrical cabling for house hold requirements.

REFERENCE BOOKS:

- (1) *A text book in Electrical Technology : B. L. Theraja - S Chand & Co ,*
- (2) *A textbook of Electrical Technology: A K Theraja*
- (3) *Performance and design of AC machines — MG Say ELBS Edn*