

SEMESTER 1st

SKILL COURSE

Course Title: Electrical Circuits and Networking Skills

Code: BET22S101

CREDIT: 2+2=4

Course Objectives:

To provide an understanding of the basics of Electrical and Electronics design with an introduction to the principles of laws governing electric and electronic science.

Learning Outcomes:

After studying this course, the students shall be able to:

- ✓ *Measure various parameters such as resistance, current, voltage and power using basic test and measuring equipment.*
- ✓ *Understand electric drawing and symbols, various generators and transformers, and basic electronic circuits.*

UNIT I: Basic Electricity Principles:

Voltage, Current, Resistance, and Power. Ohm's law. Series, parallel, and series-parallel resistance combinations. AC and DC Electricity. Familiarization with multimeter, voltmeter and ammeter. Electrical Circuits: Basic electric circuit elements and their combination. Rules to analyze DC sourced electrical circuits. Current and voltage drop across the DC circuit elements. Single-phase and three-phase alternating current sources. Rules to analyze AC sourced electrical circuits. Real, imaginary and complex power components of AC source. Power factor. Saving energy and money.

UNIT II: Electric Motors:

Generators and Transformers: DC Power sources. AC/DC generators. Inductance, capacitance and impedance. Operation of transformers. Single-phase and three-phase DC motors. Basic design. Interfacing DC or AC sources to control heaters & motors. Speed & power of ac motor. Resistors, inductors and capacitors. Diode and rectifiers. Components in Series or in shunt. Response of inductors and capacitors with DC or AC sources.

Books Recommended:

1. K.A. Smith and R.E Electrical Circuits. Alley, 2014, Cambridge University Press
2. B L Theraja, A text book in Electrical Technology - - S Chand & Co.
3. A K Theraja, A text book of Electrical Technology –
4. Performance and design of AC machines - M G Say ELBS Edn.

Laboratory component:

11. To study Ohm's Law
12. To study combination of resistors in series and parallel.
13. To verify KCL and KVL.
14. To study the V-I characteristics of an incandescent lamp
15. To measure single phase power by using three ammeter method.
16. To measure the single-phase power by using three voltmeter method.
17. To perform short circuit test on a single-phase transformer.
18. To perform open circuit test on a single-phase transformer.
19. To measure three phase power by using two wattmeter method.
20. To verify Thevenin's theorem.
21. To verify Superposition theorem.
22. To study charging and discharging of a capacitor.
23. To draw VI characteristics of a junction diode.
