

Course code: Course Title	Course Structure			Pre-Requisite
EE103: Electrical Workshop	L	T	P	NIL
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Course Objective: The objective of the course is to familiarize students with concepts of electrical supply and wiring systems, LT cables, standard rules and regulations of electrical wiring, basic protective devices in supply systems, electrical tools and measuring equipment.

S. No	Course Outcomes (CO)
CO1	Develop skills for working with electric supply systems and hands on wiring with different electrical loads.
CO2	Develop skills for working with LT cables for underground cable laying and jointing.
CO3	Develop skills for working with overhead electrical supply systems.
CO4	Enumerate LT electricity rules and regulations / electrical and fire safety standards.
CO5	Examine working of electrical protective devices and switches in LT supply systems.
CO6	Explain process of operating and handling various electrical / mechanical tools and equipment for measuring electrical parameters.

S. No	Contents
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UNIT 1	ELECTRICAL WIRING: AC Mains & switchboard, types of electrical loads and ratings, various electric lamps, Electric wiring systems, Parallel Wiring, Series Wiring, Warehouse Wiring, live wire, neutral wire, earthing wire, and principle of earthing, shielded wires, residential, commercial, or industrial wiring. Specifications of the wire, current carrying capacity, Single solid strand and Multi strands wires, Standard wire gauge (SWG), ampacity, colour codes, difference between wires and cables. Electrical fixtures- Switches, CBs/MCBs, Fuses, sockets, Plugs, light fittings, electrical junction box, Distribution Boards, Meter Boards, Modular switch/plug/boards, mapping SLD, wiring circuit diagram, selection of wires for 1-phase 220V, 3phase 3-wire, 3phase 4 wire 430V topologies, single phase and three phase power measurement, Cost economics.
UNIT 2	ELECTRIC CABLES: Specifications of cables-single phase, three phase, current carrying capacity. Types of cables and ampacity –Single core, Multi core, Armoured cables, Coaxial cable, Fibre optic cable, underground cable laying, cable jointing.
UNIT 3	OVERHEAD SUPPLY SYSTEM: LT and HT power supply voltages and systems, types of conductors, power and current carrying limits, economical size of conductor, electrical panels and associated measuring/monitoring equipment, cost estimation.
UNIT 4	ELECTRICITY SAFETY STANDARDS/ RULES/ REGULATIONS: ISO standards, safety rules and regulations, standard symbols, Safety at the workplace, Fire safety.
UNIT 5	PROTECTION DEVICES AND SWITCHES: Introduction to safety devices – MCB, ELCB, RCCB, Contactors, AC DC electrical Fuses- applications, calculation of fuse ratings, Earthing-Pipe and Plate earthing, Toggle switch- Single Pole Double Throw, Double Pole Double Throw, Triple Pole Double Throw, Centre off, without centre off, Rotary and Rockery switches and applications.
UNIT 6	ELECTRICAL TOOLS and MEASURING EQUIPMENT: Cutter, strippers, testers, pliers, Analog/ digital- voltmeter, ammeter, energy meter, wattmeter, multi-meter, Meggar, DSO.

REFERENCES		
S.No.	Name of Books/Authors/Publishers	Year of Publication / Reprint

1	Electrical Wiring Estimating and Costing; S. L. Uppal, G. C. Garg, Khanna Publishers.	2020
2	A Course in Electrical Installation Estimating and Costing; J.B. Gupta.	2021
3	Guide to Electricity Laws; Sharma & Mago, Kamal Publishers.	2020
4	Electronic component and materials; S. M. Dhir, Tata McGraw Hills.	2018
5	IET Wiring Regulations: Electric Wiring for Domestic Installers; B. Scaddan, Routledge.	2019