

UNIVERSITY OF MADRAS
B.Sc. DEGREE PROGRAMME IN PHYSICS
 SYLLABUS WITH EFFECT FROM 2023-2024

237S3B

COURSE	SKILL ENHANCEMENT COURSE-ENTREPRENEURIAL BASED
COURSE TITLE	HOME ELECTRICAL INSTALLATION
CREDITS	1
COURSE OBJECTIVES	The students will get knowledge on electrical instruments, installations and domestic wiring techniques with safety precautions and servicing.

UNITS	COURSE DETAILS
UNIT-I	SIMPLE ELECTRICAL CIRCUITS: Charge, Current, Potential Difference, Resistance – Simple Electrical Circuits – DC Ammeter, Voltmeter, Ohmmeter – Ohm’s Law – Difference between DC And AC – Advantages of AC Over DC – Electromagnetic Induction - Transformers – Inductors/Chokes – Capacitors/Condensers – Impedance – AC Ammeter, Voltmeter – Symbols and Nomenclature
UNIT-II	TRANSMISSION OF ELECTRICITY: Production and Transmission of Electricity – Concept of Power Grid – Series and Parallel Connections – Technicalities of Junctions and Loops in Circuits –Transmission Losses (Qualitative) – Roles of Step-Up and Step-Down Transformers – Quality of Connecting Wires – Characteristics of Single and Multicore Wires.
UNIT-III	ELECTRICAL WIRING: Different Types of Switches – Installation of Two Way Switch – Role of Sockets, Plugs, Sockets - Installation of Meters – Basic Switch Board – Electrical Bell – Indicator – Fixing of Tube Lights and Fans – Heavy Equipment Like AC, Fridge, Washing Machine, Oven, Geyser, Jet Pumps – Provisions for Inverter – Gauge Specifications of Wires for Various Needs
UNIT-IV	POWER RATING AND POWER DELIVERED: Conversion of Electrical Energy in to Different Forms – Work Done by Electrical Energy – Power Rating of Electrical Appliances – Energy Consumption – Electrical Energy Unit in KWH – Calculation of EB Bill – Joule’s Heating – Useful Energy and Energy Loss – Single and Three Phase Connections – Measures to Save Electrical Energy – Energy Audit.

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UNIT-V	SAFETY MEASURES: Insulation for Wires – Colour Specification for Mains, Return and Earth – Understanding of Fuse and Circuit Breakers – Types of Fuse: Kit-Kat, HRC, Cartridge, MCB, ELCB – Purpose of Earth Line – Lighting Arrestors – Short Circuiting and Over Loading – Electrical Safety – Tips to avoid Electrical Shock – First Aid for Electrical Shock – Fire Safety for Electric Current
TEXT BOOKS	<ol style="list-style-type: none">1. Wiring a House: 5th Edition by Rex Cauldwell, (2014).2. Black & Decker Advanced Home Wiring, 5th Edition: Backup Power - Panel Upgrades - AFCI Protection - "Smart" Thermostats, by Editors of Cool Springs Press, (2018).3. Complete Beginners Guide to Rough in Electrical Wiring: by Kevin Ryan (2022).