



Swami Vivekananda Rural Community College (SVRCC),

Name of the Programme- Vocational Diploma in House Electrician - Syllabus (Flexible Skill Training Mode)

Course Title	Fundamentals of Electricity, Electric Machines and Measuring Instruments
Course Code	VDHE-1
Course Credit	4

Course Objectives

While studying the **Fundamentals of Electricity, Electric Machines and Measuring Instruments**, the student shall be able to:

- Define Ohm's law, Kirchhoff's law
- Explain the Parallel and series circuit
- Describe the basic concepts of diode, MOSFET, PN Junction and rectifiers
- Understand about AC and DC Machines
- Handle the measuring instruments used by an electrician

Course Outcomes

After completion of the **Fundamentals of Electricity, Electric Machines and Measuring Instruments**, the student will be able to:

- Explain the basic term of electrical circuits
- Describe the principle of electro-magnetism and its applications
- Comprehend about Inverters and its types
- Explain the principle and working of Transformer
- Classify the measuring instruments and work using the same

Block-1: Fundamentals of Electricity and Electric Circuits

Unit-1 – Fundamentals of Electricity and Electron Theory

Fundamental terms - Basic Electrical circuits - Ohm's Law, Laws of resistance - Resistances in series and parallel - Voltage and current division - Kirchhoff's Laws and applications

Unit-2: Electric Circuits and Connections

Simple electrical circuits - Concept three-phase Star and Delta connection - Resistive, Inductive & Capacitive loads

Block-2: AC Circuits and Semiconductor Materials

Unit-3: Electromagnetism and Alternating Current Circuits

Principle of electro-magnetism - MMF, Flux density, reluctance - Fundamentals and characteristics of AC circuits - AC through R, L and C load - Power factor

Unit-4: Semi-Conductor Materials

'P' type and 'N' type -P-N-junction - Basic concept of diode, transistor, MOSFET, SCR and IGBT - D.C. rectifier circuit: Half wave, Full wave and Bridge rectifier circuit - Filter circuits

Block-3: IC's and DC Machines

Unit-5: Inverter and Integrated Circuits

Basics of Inverter - Types of Inverters - Basic concept of Integrated Circuits - Important ICs used in SMPS and UPS - Heat sink

Unit-6: DC Machines

General concept of Electrical Machines - Types of DC Machine, Constructional features of D.C machine - Principle of D.C. generator and motor - Series shunt and compound generators - Application of D.C. generators and motors.

Block-4: AC Machines and Measuring Instruments

Unit-7: AC Machines

AC motors - Constructional details of single phase motors - Types and applications - Construction of 3-phase induction motor, Starter for 3-phase induction motors - Alternator: Types, construction and operation - Transformer: construction, working principle - Types of Transformer, C.T., P.T. Instrument and Auto Transformer (Variac)

Unit-8: Electrical Measuring Instruments

Classification of Measuring Instruments - PMMC & MI meter (Ammeter, Voltmeter) - Range extension Study of Multimeter (Digital/Analog), Wattmeter - P.F. meter, Energy meter (Digital/analog) - Insulation Tester (Megger), Frequency meter - Phase Sequence meter, Tachometer - Study of Oscilloscope



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Name of the Programme- Vocational Diploma in House Electrician - Syllabus (Flexible Skill Training Mode)

Course Title	Electrical Wiring and Illumination
Course Code	VDHE-2
Course Credit	4

Course Objectives

While studying the **Electrical Wiring and Illumination**, the student shall be able to:

- Gain knowledge about electrical accessories like switches, sockets, holders etc.
- Explain about the circuit breakers and panel board
- Describe about the basics of illumination and IE rules
- Detail about the construction and working of various home electrical appliances

Course Outcomes

After completion of the **Course Electrical Wiring and Illumination**, the student will be able to:

- Perform wire crimping
- Select the type of cable required for the specific situation
- Describe about fuse and selection of circuit breaker
- Explain the functioning of all home electrical appliances

Block-1: Wire, Switches and Cables

Unit-1: Electrical Wiring

Introduction - Common Electrical wiring Accessories, their specifications - Different methods of measuring the values of resistance - Circuit connection, Solders, flux, soldering and de-soldering technique - Wire Crimping

Unit-2: Switches and Cables

Explanation of switches - Lamp holders, plugs and sockets - Conductors, Strands, Cores of Cable - Insulation of a Cable - Types and Selection of cables

Block-2: MCB, Panel Board and Illumination

Unit-3: Circuit Breakers and Panel Board

Brief description of Fuse - MCB's, MCCB's, Air, Vacuumed, Oil and SF₆ Circuit Breakers - Selection of Circuit Breakers - Panel Boards: Types

Unit-4: Lighting and Illumination

Basics of illumination - Types of light (GLS, FTL, CFL, LED, MVL etc.) - Construction, working and applications - Light selection by manual method - IE rules

Block-3: Electrical Appliances

Unit-5: Fan and Heating Appliances

Types and selection of fans used at home - Ceiling fans, Table fan, Stand fan and Exhaust Fan - Trouble shooting and servicing of fans - Construction and working of heating appliances

Unit-6: Home Electrical Appliances

Mixers & Grinders - Wet Grinders - Washing machines - Coolers, Geyser - Stabilizer

Block-4: Batteries and its Application

Unit-7: Batteries

Construction - Methods of charging - Methods of connection and maintenance - Precautions to be taken

Unit-8: Types and Applications of Batteries

Ni-cadmium & Lithium cell - Different types of lead acid cells - Sealed Maintenance free Batteries - Solar battery - Application of battery/cell in Inverter, Battery Charger, UPS.



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Name of the Programme- Vocational Diploma in House Electrician - Syllabus (Flexible Skill Training Mode)

Course Title	Installation, Maintenance and Safety
Course Code	VDHE-3
Course Credit	4

Course Objectives

While studying the **Installation, Maintenance and Safety**, the student shall be able to:

- Plan for domestic wiring installation
- Recite the importance and need for earthing
- Explain about Lightning Arrestor and Electroplating
- Describe the procedure of servicing of Home Appliances
- Gain knowledge about the safety measures to be followed

Course Outcomes

After completion of the **Course Installation, Maintenance and Safety**, the student will be able to:

- Demonstrate the earthing and wiring of house
- Perform the repairing and servicing work of fan, light, mixer, grinders, geyser etc.
- Recite about the principle of lightning arrestor

Block-1: Wiring and Earthing

Unit-1: Domestic Wiring

Domestic installation - Planning and Layout - Estimation: Domestic Installation

Unit-2: Earthing

Principle of different methods of earthing - Importance of Earthing - Improving of earth resistance - Earth Leakage circuit breaker (ELCB) - Selection of Earthing

Block-2: Lightning Arrestor and Electroplating

Unit-3: Lightning Arrestor

Introduction to Lightning Arresters - Types - Necessity and Advantages - Layout and Installation

Unit-4: Electroplating

Basic Principle - Electro Chemical effect - Explanation of Cells - Applications of Electroplating

Block-3: Servicing of Electrical Equipments

Unit-5: Servicing of Electrical Equipment -I

Servicing of Mixers & Grinders - Juicer and Chopper - Wet grinders - 1HP motors - Fans

Unit-6: Servicing of Electrical Equipment -II

Servicing of Cooler, Geyser – Stabilizer – UPS - Television - Instructions for maintenance of TV

Block-4: Electrical Hazards and Safety Measures

Unit-7: Electrical Hazards and Basic Safety

Electrical Hazards and its effects - Basic safety introduction - Personal protection and PPE - Basic injury prevention - Basic first aid - Hazard identification and avoidance

Unit-8: Safety Measures

Use of Fire extinguishers - Visit and observation of sections - Elementary first Aid - Concept of Standards



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Name of the Programme- Vocational Diploma in House Electrician - Syllabus (Flexible Skill Training Mode)

Course Title	Fundamentals of Electricity, Electrical Machines and Measuring Instruments (Practical)
Course Code	VDHE-P1
Course Credit	4

The following experiments are to be carried out:

1. Verification of ohms law by using ammeter, voltmeter in dc circuit.
2. Verification of the characteristics of DC series circuits
3. Verification of the characteristics of DC parallel circuits
4. Verification of Kirchhoff's laws by using Meter Bridge or appropriate method or by using series and parallel circuits.

5. Verification of Resistance laws by using ohm meter.
6. Testing of accumulator/lead acid battery by hydrometer and tongue tester on charging and discharging.
7. Measurement of Power by voltmeter and ammeter.
8. Construction and verification of OR , AND , NOT gate
9. Construction and verification of Universal gates: NOR, NAND – XOR gate
10. Testing on Electrical and Electronic symbols.
11. Practice on fixing electrical accessories on switch boards/main boards .
12. Lamp circuits- connection of lamp and socket by separate switches in surface conduit wiring.
13. Simple lamp circuits- install stair case wiring in surface conduit wiring. Testing of wiring by ohmmeter/ megger
14. Verify Constructional features of D.C machine.
15. Verify working of series, shunt and compound DC generators and motors.
16. Verify Constructional details of single phase AC motors and its types.
17. Verify Construction of 3 phase induction motor and Starter for 3 phase induction motors.
18. Verify construction, Working principle and types of Transformer.



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Name of the Programme- Vocational Diploma in House Electrician - Syllabus (Flexible Skill Training Mode)

Course Title	Electrical Equipment Installation, Maintenance and safety (Practical)
Course Code	VDHE-P2
Course Credit	4

The following experiments are to be carried out:

1. Procedure for testing of domestic appliances.
2. Detection of basic electrical faults such as improper / no earth, defective power cord, connector or internal wiring defect, short / loose / open contacts, blown fuse of Mixer/ Juicer/ Grinder

3. Diagnosing the reasons for appliance not running due to dysfunctional motor, overload circuit breaker tripping, no power supply – faulty fitting of dome lid cap, dome casket, jar overloading of Mixer/ Juicer/ Grinder
4. Verify the construction, working of Types. Lighting: Basics of illumination, Types of light (GLS, FTL, CFL, LED, MVL etc.)
5. Verify the Principle of different methods of earthing.
6. Verify the working and Importance of Earthing.
7. Verify the construction and working Earth Leakage circuit breaker (ELCB).
8. Verify the construction and working principle of Lightning Arresters.
9. Dismantling, re-assembling and troubleshooting of Electric Fan and Exhaust fan
10. Dismantling, re-assembling and troubleshooting of immersion water heater and hair dryer



Swami Vivekananda Rural Community College (SVRCC),

Life Coping Skills (LCS) and Communication Skills (CNS)- Core Course for all Vocational Diploma Programmes

Life Coping Skills and Communication Skills have been included to help the students to understand the meaning of life and to understand the meaning of relationship and how we communicate in every day life.

Examination System: Examination to Life Coping Skills and Communication Skills are designed to maintain quality of standard. Theory will be conducted by the University in the identified Examination Centres. For the Assignment students may be permitted to write with the help of books/materials for each Course, which will be evaluated by the Evaluators appointed by the University.

Assignment (Internal): Assignment carries 30 marks, consists of descriptive type of questions for each Course (3 X 10 = 30 Marks). Learners are expected to write 10-15 pages for each assignment. Submission of Assignment is compulsory.

Theory Examination (External): Students shall normally be allowed to appear for Theory Examination by completing Practical and Assignment. The Term-End Examination shall carry Section- A, Section- B and Section- C