

Course Name: Professional Certificate in Electric Motor Rewinding Technology (Level 1)

Contact Hours: 30 hours

Pre-requisite: Basic electrical knowledge would be an asset but is not mandatory

Abstract

Electric motors are the driving force behind modern industry. They power manufacturing equipment, pumps, compressors, conveyors, HVAC systems and countless commercial and industrial applications. As industries seek to reduce equipment replacement costs and improve operational efficiency, there is an increasing demand for technicians who possess practical skills in electric motor inspection, maintenance and rewinding.

The **Professional Certificate in Electric Motor Rewinding Technology (Level 1)** has been developed to provide participants with a strong foundation in electric motor construction, winding techniques, testing and fault diagnosis. The programme combines classroom instruction with extensive practical workshop activities, enabling participants to safely dismantle, rewind, reassemble and test single-phase induction motors using industry-standard tools and procedures.

The programme is highly practical and is delivered in SBCS GLI's engineering laboratories under the supervision of experienced practitioners.

Programme Aim

To develop competent entry-level electric motor rewinding technicians capable of safely servicing, rewinding, testing and troubleshooting single-phase electric motors using accepted industry practices.

Programme Objectives

- Explain the operating principles of electric motors.
- Apply safe workshop practices and electrical safety procedures.
- Identify the various components of single-phase induction motors.
- Interpret motor nameplate information and electrical specifications.
- Properly dismantle electric motors without damaging components.
- Record winding data accurately.
- Remove defective windings.
- Manufacture replacement coils using approved winding techniques.
- Install and connect replacement windings.
- Apply insulation materials correctly.
- Perform varnishing and finishing operations.
- Test completed motors using electrical test equipment.
- Diagnose common electrical and mechanical motor faults.
- Successfully complete a basic motor rewinding project.

Target Audience

This course is geared towards:

- Electrical technicians
- Maintenance technicians
- Industrial maintenance personnel
- Mechanical technicians
- Apprentices
- Recent secondary school graduates
- TVET graduates
- Electricians wishing to diversify their skills
- Individuals seeking self-employment opportunities
- Persons wishing to establish an electric motor repair business.

Learning Outcomes

On completion of this course, learners will be able to:

- Work safely in accordance with electrical and workshop safety standards.
- Identify and describe the operation of common electric motors.
- Identify stators, rotors, bearings, shafts, cooling fans and associated motor components.
- Interpret motor nameplates and electrical ratings.
- Use multimeters, insulation resistance testers and other diagnostic equipment.
- Remove damaged windings safely.
- Record winding data accurately.
- Manufacture replacement coils.
- Install slot insulation and replacement windings.
- Connect and terminate motor windings correctly.
- Perform continuity and insulation resistance testing.
- Diagnose common electrical and mechanical faults.
- Reassemble and commission a rewound motor.

Course Content

Module 1 - Introduction to Electric Motors

- Types of electric motors
- Industrial applications
- AC versus DC motors
- Single-phase induction motors
- Basic operating principles
- Motor classifications

Module 2 - Workshop Safety

- Personal Protective Equipment (PPE)
- Electrical hazards
- Safe workshop practices
- Safe use of hand tools
- Lock-out/Tag-out principles
- Fire safety
- Workshop housekeeping

Module 3 - Electrical Fundamentals

- Voltage
- Current
- Resistance
- Ohm's Law
- Power
- AC versus DC
- Series and parallel circuits
- Introduction to electrical measurements

Module 4 - Electric Motor Construction

- Stators
- Rotors
- Bearings
- Shafts
- Cooling systems
- Terminal boxes
- Nameplates
- Frame sizes

Module 5 - Introduction to Motor Windings

- Coil terminology
- Slot numbering
- Winding layouts
- Coil pitch
- Wire gauges
- Insulation materials
- Recording winding data

Module 6 - Motor Rewinding Techniques

- Removing damaged windings
- Cleaning stators
- Manufacturing replacement coils
- Coil forming
- Slot insulation
- Installing replacement coils
- Coil connections
- Lacing and tying

Module 7 - Testing and Fault Diagnosis

- Continuity testing
- Insulation resistance testing
- Fault finding
- Common motor failures
- Bearing inspection
- Mechanical defects

Module 8 - Final Practical Project

- Motor dismantling
- Recording winding data
- Coil manufacture
- Rewinding
- Reassembly
- Testing
- Commissioning