REPUBLIC OF KENYA

COMPETENCY-BASED CURRICULUM

FOR

ELECTRICAL INSTALLATION

KNQF LEVEL 4

ISCED PROGRAMME CODE:07130454B

TVET CDACC
P.O BOX 15745-00100
NAIROBI

ELECTRICAL PRINCIPLES

UNIT CODE: ENG/CU/EI/CC/03/4/B

Relationship to Occupational Standards

This unit addresses the unit of competency: Apply eelectrical principles skills

Duration of Unit: 40 hours

Unit Description

This unit describes the competencies required to apply electrical principles. It involves using the concept of basic electrical quantities, D.C and A.C circuits in electrical installation, single phase electrical machine, earthing in electrical installations and applying capacitance and inductance

Summary of Learning Outcomes

1. Use the concept of basic eelectrical quantities
2. Use of D.C and A.C circuits in electrical installation
3. Use of single phase electrical machines
4. Perform earthing in Electrical installations
5. Apply capacitance and inductance

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods
1. Use the concept of basic Electrical quantities	• The meaning of SI unit • SI unit of Electrical quantities • Calculations involving various Electrical quantities e.g Charge, Power, Current, Voltage, Resistance • Instruments used in measuring Electrical quantities	• Written tests • Oral questioning • Assignments • Supervised exercises
2. Use of D.C and A.C circuits in electrical installation	• Meaning of terms • Conductors and insulators • Ohm's law • Resistance variation • Resistors and color coding • AC and DC circuits • R-L, R-C, R-L-C circuits • Series	• Written tests • Oral questioning • Assignments • Supervised exercises

	• Parallel • Parallel and series • Parallel resonance and Q-factor • Power factor improvement • AC and DC network theorems e.g • Kirchoff's laws • AC to DC and DC to AC Conversion	
3. Use of single phase electrical machines	• Single phase Electrical machines • DC single phase motors and generators • AC Single phase motors and generators • Single phase transformers • Application of AC and DC machines • Motor starter • DC Motor speed control • Motor cooling	• Assignments • Oral questioning • Supervised exercises • Written tests • Practical tests
4. Perform earthing in Electrical installations	• Meaning of earthing • Terms in earthing • earthing systems • earthing points in electrical installation • IEE regulations • Factors to consider in selecting an earthing system • Testing an earthing system • earthing improvement	• Assignments • Supervised exercises • Written tests • Practical test
5. Apply capacitance and inductance	• Meaning of electrostatic field • Sources of electrostatic field • Meaning of terms • Electric field strength • Capacitance • Capacitors • Electric flux density • Permittivity • Types capacitors • Charging and discharging	• Assignments • Oral questioning • Supervised exercises • Written tests •

	• Capacitors connection • Series • Parallel • Parallel and series • Application of capacitors • Calculations involving capacitors • Magnetic circuits • Magnetic fields • Magnetic flux and flux density • Magnetomotive force and magnetic field strength • Permeability and B-H curves • Hysteresis and hysteresis losses • Force on current-carrying conductor • Principle of operation of a simple DC motor • Principle of operation of a moving coil instrument • Electromagnetic field and electromagnets • Electromagnetic induction • Laws of electromagnetic induction • Rotation of a loop in a magnetic field • Inductance and inductors • Inductor connections • Series • Parallel • Parallel and series • Applications of inductors	

Suggested methods of instructions

- Group discussions
- Demonstration by trainer
- Exercises by trainee

Recommended Resources

- Scientific Calculators
- Relevant reference materials

- Stationeries
- Electrical workshop
- Relevant practical materials
- Dice
- Computers with internet connection