COMPETENCY BASED CURRICULUM

FOR

ELECTRICAL ENGINEERING (POWER OPTION)

KNQF LEVEL: 6

ISCED PROGRAMME CODE: 0713 554B

TVET CDACC
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NAIROBI

SOLAR SYSTEM INSTALLATION

UNIT CODE: ENG/CU/PO/CR/07/6/B

Relationship to Occupational Standards
This unit addresses the unit of competency: Install Solar Systems

Duration of Unit: 72 hours

Unit Description

This unit covers the competencies required to install solar system. Competencies includes; designing solar system installation, fixing solar system components, mounting solar panel, laying cables, terminating electrical and testing of a solar installation system.

Summary of Learning Outcomes

1. Design solar system installation
2. Fix solar system accessories
3. Mount solar Panel
4. Lay out Electrical cables
5. Terminate Electrical cables
6. Test and inspect solar system installation

Learning Outcomes, Content and Suggested Assessment Methods

Learning Outcome	Content	Suggested Assessment Methods

1. Design solar system installation	• Meaning of solar system
	• Meaning of terms
	• Size and rating of solar panel
	• Types of solar panel e.g.
	  • PV Solar
	  • Monocrystalline
	  • Polycrystalline
	• Solar Panel Mounting positioning
	• Components of solar system
	  • Charger controller
	  • Inverters
	  • Solar batteries
		• Written tests
		• Oral questioning
		• Observation
		• Practical tests

	• Cables	

2. Fix solar system components	• Methods of solar panel connection
	  • Parallel and series
	• Solar panel components
	• Types of charge controllers e.g.
	  • Pulse width Modulated
	  • Maximum power point tracking.
	  • Simple one or two stage controls
		• Observation
		• Oral questioning
		• Written tests

3. Mount Solar panel	• Meaning of solar panel
	• Meaning of Terms
	• Types of Solar panels
	• Installation of Solar panel
	  • Slanting angle
	  • Panel Ratings
	  • Factors to consider in solar panel Selection and installation
		• Observation
		• Oral questioning
		• Practical tests
		• Written tests

4. Lay Electrical cables	• Cable laying tools • Cable segregation • Cable labelling	• Observation • Oral questioning • Practical tests • Written tests
5. Terminate Electrical cables	• Meaning of terms • Cable lugging • Cable connectors	• Observation • Oral questioning • Practical tests • Written tests

6. Test Solar system installation	• Meaning of test
	• Types of tests
	  • Insulation resistant test
	  • Short circuit test
	  • Ring circuit test
	  • Continuity test
	  • Earth continuity test
	  • Firmness test
		• Observation
		• Oral questioning
		• Practical tests
		• Written tests

Suggested Methods of Instruction

- Demonstration by trainer
- Practice by the trainee
- Field trips
- On-job-training
- Discussions

Recommended Resources

Tools

- Set of screw drivers
- Set of spanners and wrenches
- Power tools
- Cutting tools
- Pliers
- Lifting and tensioning tools
- Tool box
- Phase tester

Materials and supplies

- Stationery
- Cables
- Lubricants
- Service parts

Equipment

- PPE –hand gloves, dust coat, dust masks
- Multimeter
- Clamp meter
- Earth electrode resistance meter
- Phase sequence meter

Reference materials

- Service manuals
- IEE regulations
- Organization procedures manual