Scope of work/supply

To provide Training (as per SAQA and relevant legislative requirements) to Gauteng Cluster employees on the listed subjects.

COURSE CONTENT		
MODULE	**HOURS**	**CONTENT**
CCD	2	Course Control Document
UP – T	5	Convert units and prefixes
MA – T	12	Explain electromagnetism
EU – T	15	Analyse electrical units
PS – T – 1	4	Explain single phase power supplies
PS – T – 2	4	Explain three phase power supplies
EM - T – 1	5	Explain the use of electrical measuring instruments
TI – 1	12	Use electrical testing instruments
PW – 1	10	Measure resistance
CC – T	10	Select conductors and cables
CT - 1	4	Test a low tension cable
CA – 1	2	Fit a 16 ampere plug top
CA – 2	2	Fit a compression gland
CA – 3	2	Fit a gland
CA – 4	4	Join a low tension cable
TT – 1	8	Explain single phase transformers
TT – 2	3	Explain three-phase transformers
SD – T	5	Star-delta transformer theory
EL – T	5	Explain single phase earth leakage protection circuits
EL - T – 1	5	Explain three-phase earth leakage protection circuits
TC – 1	24	Connect transformers
FF – 1 – E	8	Fault find basic electrical circuits
LS – 1	8	Light switching
EM – 1	6	Connect a single phase energy meter
EC-1	40	Wire circuits
MMI - E	5	Measure and mark off material
OPE-1	3	Use and maintain a portable drilling machine
OPE-2	3	Operate a portable angle grinder
HM-1	12	Use hand tools
	8	INDUCTION

ELECTRICAL INDEX		
COURSE CONTENT (IN COURSE MAP SEQUENCE) **BASIC TRAINING MODULES**		
MODULE	**BOOK NO**	**CONTENT**
CCD		Course Control Document
ST	1	Perform safe work practices (Acts & Regulations)
UP – T	1	Convert units and prefixes
MA – T	1	Explain electromagnetism
EU – T	1	Analyse electrical units
PS – T – 1	1	Explain single phase power supplies
PS – T – 2	1	Explain three phase power supplies
EM – T – 1	1	Explain the use of electrical measuring instruments
EM – T – 2	1	Read energy meters
TI – 1	1	Use electrical testing instruments
PW – 1	1	Measure resistance
CC – T	2	Select conductors and cables
CT – 1	2	Test a low tension cable
CA – 1	2	Fit a 16 ampere plug top

CA – 2	2	Fit a compression gland
CA – 3	2	Fit a gland
CA – 4	2	Join a low tension cable
TT – 1	2	Explain single phase transformers
TT – 2	2	Explain three-phase transformers
SD – T	2	Explain star & delta connections
EL – T	2	Explain single phase earth leakage protection circuits
EL – T – 1	2	Explain three-phase earth leakage protection circuits
CW – T	2	Wire a panel
TC – 1	2	Connect transformers
FF – 1 – E	2	Fault find basic electrical circuits
LS – 1	3	Light switching
LC – 1	3	Identify lights and lighting circuits
SW – 1	3	Wire a three-heat stove switch
SW – 2	3	Wire a five-hat stove switch
SW – 3	3	Wire a thermostatic control switch
EM – 1	3	Connect a single phase energy meter
CW – 1	3	Construct and wire installations
IT – 1	3	Test a single phase installation
CO – T	4	Identify contactors and overloads for various applications
EC – 1	4	Wire circuits
SP – T	4	Explain single phase motors
MT – 1	4	Test a single phase motor
SP – 1	4	Connect a flexible cord to a single phase motor
SP – 2	4	Connect a single phase motor to a selector switch
SP – 3	4	Connect a single phase motor to reversing contactors
CM – T	4	Explain induction motors
MT – 2	4	Test three-phase motors
MP – 1	4	Phase out an induction motor
DO – L	4	Wire a direct-on-line starter
PW – 3	4	Wire a three-phase reversing starter
PW – 2	4	Wire sequence starters
BIF	5	Examine bearings
BRR – 1	5	Mount a bearing manually
BRR – 2	5	Remove a bearing mechanically
BRR – 3	5	Remove and mount bearings
MO – 1 – MW	5	Overhaul a three-phase motor
DRG	5	Read and interpret technical drawings
MMI – E	5	Measure and mark off material
MG	5	Use and maintain a pedestal grinder
OPE – 1	5	Use and maintain a portable drilling machine
OPE – 2	5	Operate a portable angle grinder
HM – 2	5	Use and maintain a pedestal drill
HM – 1	5	Use hand tools
OAW – E	5	Use oxy-acetylene and arc welding equipment

ELECTRICAL INDEX		
ADVANCED TRAINING MODULES		
MODULE	**BOOK NO**	**CONTENT**
SD – 2		Wire a semi-automatic start-delta starter
SD – 3		Wire a fully automatic start-delta starter
SL – 1		Wire a resistance starter to a slip ring motor
SL – 2		Wire a liquid starter to a slip ring motor
AT – 1		Wire a fully automatic auto-transformer starter

PM – T		Explain pole changing motor theory
PM – 1		Connect a three-phase pole changing motor to a starter and selector switch
PM – 2		Connect a three-phase pole changing motor to contactors
PM – 3		Connect a three-phase changing motor to a fully automatic starter
DC – T		Explain the theory of direct current machines
DC – 1		Connect a load to a DC generator
DC – 2		Connect a DC motor and starter
DC – 3		Connect a Ward-Leonard speed control
EM – 2		Connect a three-phase energy meter
EM – 3		Connect a three-phase energy meter with range extension
PW – 4		Wire a three-phase balanced load
PW – 5		Connect three single phase energy meters
IT – 2		Test a three-phase installation
FF - 2 – E		Fault find live electrical circuits

ELECTRICAL INDEX		
ADVANCED TRAINING MODULES **OPTIONAL TRAINING MODULES**		
MODULE	**BOOK NO**	**CONTENT**
CA – 5		Make off a paper insulated, wire armoured cable end
CA – 6		Make off a cross linked polyethylene (XLPE) cable end
RA – E – 1		Maintain a storage battery
RA – E – 2		Maintain auto-electrical systems
SD – 1		Wire a manual start-delta starter
SL – 3		Wire a grid and controller to a slip ring motor
SL – 4		Wire a vapourmatic starter

ELECTRICAL INDEX		
BASIC ELECTRONICS TRAINING MODULES (INCLUDED IN ADVANCED TRAINING)		
MODULE	**BOOK NO**	**CONTENT**
HM – 3		Solder components
BE – 1		Identify and use resistors
BE – 2		Identify and use inductors
BE – 4		Identify diodes
TI – 2		Use an oscilloscope
BE – 5		Construct rectification circuits
BE – 6		Identify and use Zener diodes
BE – 7		Construct a voltage doubler
BE – 8		Identify transistor action
BE – 9		Identify transistor configurations
BE – 10		Test regulated power supplies
BE – 11		Test thyristors
BE – 12		Test thyristor phase control
BE – 13		Explain and apply PLC operating principles
FF – 1		Fault find circuits 1

ELECTRICAL INDEX		
ADVANCED ELECTRONICS TRAINING MODULES (OPTIONAL)		
MODULE	**BOOK NO**	**CONTENT**
IE – 1		Test an amplifier
IE – 2		Use a transistor as a switch
IE – 3		Test multivibrators
FF – 2		Fault find circuits 2
IE – 4		Identify operational amplifiers
PCC		Construct a continuity tester
IE – 5		Test a field effect transistor
IE – 6		Test logic gates

FF – 3		Fault find circuits 3
IE – 7		Test electronic systems

ELECTRICAL INDEX		
MEDIUM VOLTAGE TRAINING MODULES (OPTIONAL)		
MODULE	**BOOK NO**	**CONTENT**
CTJ		Make off MV cable terminations and joints
ETI		Use electrical test instruments for MV systems wings
RID		Read and interpret single line MV drawing
HTR		Understand the principles of operation and work on MV equipment
LHTT		Understand the principles of operation and test low and medium voltage transformers
HTS		Identify substation equipment and apply regulations

FINAL TRAINING & ARPL

Trade Test Preparation, Testing and re-writes.

Artisan Recognition of Prior Learning (ARPL)

Provision of Recognition of Prior learning for above course/module breakdown as per candidates previous learning and experience.

- Provide QCTO accredited training and development as per ARPL Phase 1 to 4 for Electrical Engineering.
- Evaluation or Gap Assessments – Phase 1
- Gap closure training – Phase 2
- Trade Preparation – Phase 3
- Electrical Trade Test -Phase 4
- Trade Test Re-writes

ELECTRICAL ENGINEERING NATED CERTIFICATES (N1 - N6)

Provision of Electrical Engineering Nated courses to Gauteng Cluster employees as and when needed.
NATED Electrical Engineering (N1–N6) covers heavy and light current subjects, including Mathematics, Engineering Science, Industrial Electronics, Electrotechnics/Electrical Trade Theory, and Logic Systems. The curriculum focuses on AC/DC theory, machines, transformers, and digital electronics to prepare students for artisan, technician, or engineering roles.

N1 CERTIFICATE
- Mathematics
- Industrial Electronics
- Engineering Science
- Electrical Trade Theory

N2 CERTIFICATE
- Mathematics
- Industrial Electronics
- Engineering Science or Logic Systems
- Electrical Trade Theory

N3 CERTIFICATE
- Mathematics
- Industrial Electronics
- Engineering Science or Logic Systems

N4 CERTIFICATE

- Mathematics
- Industrial Electronics
- Engineering Science
- Electro Technics

N5 & N6 CERTIFICATE

- Mathematics
- Electro Technics
- Industrial Electronics
- Power Machines

WIREMAN'S LICENSE

Offer a Wireman's License training to equip qualified electricians with the technical and legal competencies required to legally inspect, test, and certify electrical installations, and issue Certificates of Compliance (CoCs).

To prepare candidates to meet the official requirements of the Department of Labour (DoL)

Core areas to be covered:

- **Legislation & Regulations:** In-depth coverage of the Occupational Health and Safety Act (OHSA) and the Electrical Installation Regulations.
- **SANS 10142-1:** Mastery of the latest national wiring code (e.g., SANS 10142-1), focusing on electrical safety standards, design principles, and correct installation methods.
- **Inspection & Testing Procedures:** Practical, hands-on training with testing instruments (e.g., Earth Resistance Testers, Insulation Testers, and Loop/PSC Impedance Testers) to verify electrical integrity.
- **Fault-Finding:** Identifying and diagnosing faults, as well as executing repairs to ensure full compliance.
- **Documentation & Administration:** Correctly interpreting matrices, filling out test reports, and understanding how to legally issue a CoC.


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