



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

**Curriculum and Assessment Policy
Statement: Technical Occupational
Year 1 - 4**

**ELECTRICAL TECHNOLOGY:
ELECTRICAL**

PUBLIC COMMENT

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SECTION 1:

INTRODUCTION TO THE CURRICULUM AND ASSESSMENT POLICY STATEMENT: TECHNICAL OCCUPATIONAL

1.1 Background

The South African Constitution, Act 108 of 1996, enshrines the right of every child to access quality basic education without there being any form of discrimination. There are learners participating in the General Education and Training Band who have an interest and talent in applied knowledge and in technical and vocational skills subjects which are currently not available in the National Curriculum Statement, Grades R to 12 (2011). This cohort of learners should be given an opportunity to achieve a formal qualification or recognition of achievement towards a qualification that is related to any vocational and occupational learning within their area of interest and aptitude.

This Subject Statement has been developed to respond more effectively to the needs of these learners who have been identified and assessed through the protocols approved by the Department of Basic Education and who will benefit from curriculum content that is aligned to the Senior Phase of the National Curriculum Statement at a more applied and functional level in accordance with their interest and aptitude.

It is critical, that through differentiated methodologies, the learners enrolled for this qualification will be able to progress with regard to applied competencies, even where they might not be able to attain the minimum theoretical requirements of the respective grades of the senior phase. There should always be high expectations for all learners and the necessary scaffolding and learning support to master foundational competencies (language and numeracy) relevant to the specific subject, so that they are in a position to demonstrate the practical competencies that they have mastered which will make it possible for them to progress to further education and training pathways.

The learning programme will be structured in such a way that it would adequately prepare learners to progress onto the academic, technical vocational or technical occupational pathways of the Further Education and Training Band, albeit with endorsement. It will also enable learners across the range of competencies and aptitudes to obtain a recognised and accredited qualification or certificate of attainment.

The programme aims at contributing to the ideal of education to produce learners who will function **meaningfully** and **effectively** in the society, be able to enter future **careers** and be equipped to meet the requirements of the **economy** (local and global).

1.2 Overview

Through the policy document the Minister of Basic Education will be able to prescribe the minimum norms and standards for technical occupational education in the General Education and Training band.

The following legal framework will be adhered to:

- (i) National Curriculum Statement, Grades R to 12 (2011) together with the National Protocol for Assessment and the National Policy pertaining to the Programme and Promotion Requirements of the National Curriculum Statement, Grades R to 12;
- (ii) Draft Technical Vocational Subject Statements listed in the Draft General Certificate of Education: Technical Occupational, a Qualification at Level 1 on the National Qualification Framework;
- (iii) General and Further Education and Training Quality Assurance Act, 2001 (Act No.58 of 2001); the General and Further Education and Training Amendment Act, 2008 (Act No 50 of 2008); the NQF Act, 2008 (Act no 67 of 2008) and the Continuing Education and Training Act, 2006 as amended by Act No 3 of 2012 and Act No 1 of 2013;
- (iv) The General and Further Education and Training Qualifications Sub- Framework (August 2013);
- (v) Standards and quality assurance for General and Further Education and Training (June 2008, Revised April 2013);
- (vi) Policy and regulations pertaining to the conduct, administration and management of assessment for the General Education and Training Certificate in Skills and Vocational Training: A qualification at Level 1 on the National Qualification Framework (NQF);
- (vii) Education White Paper 6 on Special Needs Education: Building an Inclusive Education and Training System (2001);

- (viii) The United Nations Convention on the Rights of Persons with Disabilities adopted by the United Nations General Assembly on 13 December 2006 and ratified by the South African parliament on 5 June 2007;
- (ix) The White Paper on the Rights of Persons with Disabilities, 2015;
- (x) Section 11 of the Children's Act (2007);
- (xi) Chapter 5, section 76 of the Children's Act as amended (2007);
- (xii) Umalusi's Quality Assurance of Assessment: Directives, Guidelines and Requirements;
- (xiii) Skills Development Act, 1998 (Act 97 of 1998); and
- (xiv) Assessment Policy for Qualifications and Part Qualifications on the Occupational Qualifications Sub-Framework (OQSF), 2014 of the QCTO.

1.3. General Aims of the Technical Occupational Curriculum

- (a) The National Curriculum Statement, Grades R to 9 gives expression to the knowledge, skills and values worth learning in South African schools. The Technical Occupational Curriculum aims to ensure that learners, irrespective of their abilities, have the opportunity to develop competences for meeting challenges and taking up opportunities in the fast changing 21st century and are also guided to apply knowledge and skills in ways that are meaningful to their own lives. In this regard, the curriculum promotes knowledge in local contexts, while being sensitive to global imperatives, including the demands of the fourth industrial revolution. Sustaining development-relevance in the face of constant and rapid change requires curricula to be lifelong learning systems in their own right, capable of constant self-renewal and innovation.
- (b) The curriculum serves the purposes of:
 - Equipping learners, irrespective of their socio-economic background, race, gender, physical ability or intellectual ability, with the knowledge, skills and values necessary for self-fulfilment, and meaningful participation in society as citizens of a free country;
 - Promoting critical thinking, creativity and innovation, communication, collaboration, information, media and ICT literacies, flexibility and adaptability, initiative and self-direction, social and cross-cultural, productivity and accountability, leadership and responsibility and life-long learning;
 - Facilitating the transition of learners from education institutions to the workplace;

- Providing employers with a sufficient profile of a learner's competences.
- Being sensitive to issues of diversity such as poverty, inequality, race, gender, language, age, and other factors;
- Valuing indigenous knowledge systems: acknowledging the rich history and heritage of this country as important contributors to nurturing the values contained in the Constitution; and
- Credibility, quality and efficiency: providing an education that is comparable in quality, breadth and depth to those of other countries.

(c) The curriculum is based on the following principles:

- Social transformation: ensuring that the educational imbalances of the past are redressed, and that equal educational opportunities are provided for all sections of the population;
- Active and critical learning: encouraging an active and critical approach to learning, rather than rote and uncritical learning of given truths;
- High knowledge and high skills: the minimum standards of knowledge and skills to be achieved at each grade are specified and set high, achievable standards in all subjects;
- Progression: content and context of each grade shows progression from simple to complex; and
- Human rights, inclusivity, environmental, gender and social justice and equality: infusing the principles and practices of social justice and human rights as defined in the Constitution of the Republic of South Africa as well as the greening of the economy.

(d) Inclusivity should become a central part of the organisation, planning and teaching at each school. This can only happen if all teachers have a sound understanding of how to recognise and address barriers to learning, and how to plan for diversity. The key to managing inclusivity is ensuring that barriers are identified and addressed by all the relevant support structures within the school community, including teachers, District-Based Support Teams, School-based Support Teams, parents and Special Schools as Resource Centres. To address barriers in the classroom, teachers should use various curriculum differentiation strategies such as those included in the Department of Basic Education's Guidelines for Responding to Learner Diversity in the Classroom (2011), as well as the Standard Operating Procedures for Accommodations in Assessment (2016).

1.3.1. The aims of the General Certificate of Education: Technical Occupational

The specific aims of the qualification are to:

- Give recognition to learners who would meet the requirements and achieve the competencies as specified in the Exit Level Outcomes and associated Assessment Criteria as set out in the GFETQSF along differentiated pathways;
- Provide a foundation of quality, standardised general education which will suit the needs of these learners and help prepare them for life after school and enable them to access particular employment or occupational workplace-based learning. It may also enable the learners to access a vocational qualification at a Technical and Vocational Education Training College;
- Promote Lifelong learning to enable learners to continue with further learning and skills development in the workplace;
- Prepare learners to function better in a fully inclusive society and workplace; and
- Provide employers with a profile of the learner's competence.

Learners successfully completing the qualification will be able to:

- Identify, select, understand and apply knowledge to the intended purpose and identify solutions to problems in the field of study;
- Demonstrate the necessary applied knowledge and skills identified for competence in a subject, as specified in the subject statement;
- Demonstrate knowledge and skills gained for purpose of formal communication and basic numerical operations;
- Have the ability to apply knowledge and skills in changing contexts;
- Reflect on their learning in order to promote an interest in learning and further study; and
- Demonstrate basic entrepreneurial skills that will enable them to create their own work and business opportunities in the contexts in which they live.

1.4. Subjects and Time Allocation

Instructional Time for the Technical Occupational Learning Programmes is 27½ hours in a five-day cycle

Subjects		Time	
General Education			
Languages (Home Language and First Additional Language) All 11 official languages (Afrikaans, English, isiNdebele, isiXhosa, isiZulu, Siswati, Sesotho, Setswana, Sepedi, Tshivenda, Xitsonga)		3 Hours for Home Language	
		2 hours for First Additional Language	
Mathematics		3 hours	
Life Skills	Personal and Social Well-being (including aspects of Life Orientation, Social Sciences and Economic and Management Sciences)	2½ hours	6 hours
	Physical Education	1 hour	
	Creative Arts	1 hour	
	Natural Sciences	1½ hours from year 2 onwards This time to be used in year 1 to support Languages and Mathematics	
Information Communication Technology ICT is a compulsory subject for all learners. It can be offered either as a stand-alone or integrated across various subjects. If offered as a stand-alone a school may use time allocated to the Technical Occupational programme. ICT does not count towards the qualification but is a necessary life-long skill. ICT is not to be confused with the Technical Occupational Subject “Office Administration” which is an elective.			

Subjects	Time
Technical Occupational: Electives	
Agricultural Studies Art and Crafts Civil Technology: Bricklaying and Plastering Civil Technology: Plumbing Civil Technology: Woodworking and Timber Consumer Studies: Food Production Consumer Studies: Sewing Early Childhood Development Electrical Technology: Electrical Hospitality Studies Mechanical Technology: Body Works: Panel Beating and or Spray Painting Mechanical Technology: Motor Mechanics Mechanical Technology: Sheet Metal Work Mechanical Technology: Welding Mechanical Technology: Maintenance Office Administration Personal Care: Ancillary Health Care Personal Care: Beauty and Nail Technology Personal Care: Hairdressing Service Technology: Upholstery Wholesale and Retail	13½ hours
Total: General and Occupational	27½

The table below proposes the learner progression across the years at a School of Skills.

Year 1 Minimum of 1 year of orientation	Year 2	Year 3	Year 4
<p>Base Line Assessment for Language and Mathematics</p> <p>➤ Intervention (ISP)</p> <p>General Education:</p> <ul style="list-style-type: none"> • Home Language • FAL • Mathematics • Life Skills: <ul style="list-style-type: none"> ✓ Personal Social Wellbeing ✓ Physical Education ✓ Creative Arts <p>➤ <u>ICT Enrichment</u></p> <p>Technical Occupational</p> <p>Minimum 2 x SKILLS Across the year</p> <p>Post Assessment</p> <ul style="list-style-type: none"> • Analyse results <p>Progress to Year 2 with appropriate support for Languages and Mathematics</p>	<p>General Education:</p> <ul style="list-style-type: none"> • Home Language • FAL • Mathematics • Life Skills: <ul style="list-style-type: none"> ✓ Personal Social Wellbeing ✓ Physical Education ✓ Creative Arts ✓ Natural Sciences <p>➤ <u>ICT Enrichment</u></p> <p>Technical Occupational</p> <p>Minimum of 1 Skill</p>	<p>General Education:</p> <ul style="list-style-type: none"> • Home Language • FAL • Mathematics • Life Skills: <ul style="list-style-type: none"> ✓ Personal Social Wellbeing ✓ Physical Education ✓ Creative Arts ✓ Natural Sciences <p>➤ <u>ICT Enrichment</u></p> <p>Technical Occupational</p> <p>Minimum of 1 Skill</p>	<p>General Education:</p> <ul style="list-style-type: none"> • Home Language • FAL • Mathematics • Life Skills: <ul style="list-style-type: none"> ✓ Personal Social Wellbeing ✓ Physical Education ✓ Creative Arts ✓ Natural Sciences <p>➤ <u>ICT Enrichment</u></p> <p>Technical Occupational</p> <p>Minimum of 1 Skill</p> <p>GCE: TO Qualification</p> <p>Or</p> <p>Certificate of Achievement</p> <p>(External exam- results verified / moderated)</p>

Note:

Year One is an orientation year and learners must be exposed to a minimum of two occupational skills so that they can select a skill with which they will continue from Year Two. Schools that offer more than the minimum two skills in Year One may adapt the Annual Teaching Plan for Year One to accommodate their rotation system to expose learners to more skills e.g. schools may offer a skill per term for Terms 1, 2 and 3 and learners then select the skill they will specialise in and start it in Term 4. It is important that learners in Year One experience the core competencies of the skills so that an informed choice can be made.

Years Two, Three and Four are the critical years for learners. It is important that learners are exposed to all the Topics and Specific Aims per selected Occupational skill, acknowledging that not all learners will be successful in all of these.

SECTION 2:

INTRODUCTION TO ELECTRICAL TECHNOLOGY

2.1 What is Electrical Technology?

Electrical Technology focuses on the understanding and application of electrical principles in electrical installations. Electrical installations refer to domestic installations and appliances. Electrical principles refer to the following:

- How does electricity work?
- Electricity generation
- Distribution
- The domestic installation
- Applications of electricity.

2.2 Topics to be studied in ELECTRICAL TECHNOLOGY

1. Health and safety (OHS ACT)
2. First Aid
3. Tools
4. Basic principles of electricity
5. Electrical Measuring Instruments
6. Power sources
7. Electrical circuits and components
8. Conductors and cables
9. Domestic installations
10. Electrical motors and transformers

2.3 Specific Aims

The learner is able to:

1. Comply with good housekeeping practices
2. Apply health and safety to a work area
3. Apply basic First Aid
4. Work with basic hand tools and materials
5. Adhere to basic principles of electricity
6. Work with electrical measuring instruments
7. Work with different electrical circuits and components
8. Follow conductor installation procedures and work with different cables.
9. Understand and apply domestic installation rules
10. Understand and work with electrical motors and transformers

2.4 Requirements for Electrical Technology as a subject.

Schools wishing to offer Electrical Technology to learners should consider the following requirements that should be met in order to successfully implement the subject.

2.4.1 Time Allocation

The total number of hours allocated for the subject in a five day cycle is 13.5 hours. Sufficient time must be allocated in the school timetable for the practical work required to be done. The work has to be planned and stipulated: 9.25 hours are allocated for practical work and 4.25 for theoretical work

2.4.2 Resources

The offering of Electrical Technology also requires human resources, Infrastructure, equipment and finances.

Human resources

Electrical Technology requires a trained subject specialist. The teacher offering Electrical Technology should be an artisan / technician / technical teacher in electrical related subject. Industry related experience, workshop management skills and a tertiary qualification in technical teaching are needed. Electrical Technology teachers are required to:

- Teach the subject content with confidence and flair
- Interact with learners in a relaxed but firm manner
- Manage the workshop resourcing, budget & safety
- Manage the teaching environment
- Conduct stock taking and inventory
- Plan for practical work
- Plan for theory lessons
- Plan assessment criteria
- Conduct weekly practical sessions
- Maintain and service the workshop as a whole
- Maintain and service the tools and instruments
- Ensure learner safety
- Produce working PAT projects in cooperation with learners
- Carry out School Based Assessment (SBA)
- Implement innovative methods to keep the subject interesting
- Be self-motivated to keep her/him abreast of the latest technological developments
- Regularly attend skills workshop
- Subject advisers must provide regular support to the teachers

Learner Resources:

Each learner should have access to:

- Workbook / Textbook
- Workshop with tools and equipment
- Calculator
- Measuring equipment

2.4.3 Infrastructure, equipment and finances

Schools must ensure that teachers have the necessary infra-structure, equipment and financial resources for quality teaching and learning.

Infrastructure

- Electrical Technology cannot be offered in a school without an equipped workshop.
- Electrical supply, 230 V is a basic requirement in the workshop.

- Lighting and ventilation is of extreme importance and a workshop should ideally have multiple exits with doors that open outward.
- Tools and equipment and materials should have sufficient storage and well developed storage management system with an up to date inventory.
- Shelves and display boards for tools should be clearly marked and storage areas defined.
- Good housekeeping principles require that all workshops be cleaned regularly. A suitable waste removal system should be in place to accommodate refuse, rubble materials as well as waste. The requirements of the Occupational Health and Safety (OHS) Act 85 of 1993 need to be complied with at all times.

Equipment

Consumables: Goods that are capable of being consumed, that may be destroyed, dissipated, wasted or spent.

Non-Consumables: Goods that cannot be consumed or destroyed, dissipated, wasted or spent over a long period of time

Tools: Something used in performing an operation or necessary in the practice of a vocation or profession.

Equipment: The set of articles or physical resources serving to equip a person or a thing.

The following equipment is the minimum requirement to operate the Electrical Technology workshop.

Table for equipment needed			
Consumables	Non-Consumables	Tools	Equipment
Solder wire x10 rolls	Textbook level 1 x15	Bench type drill Press 13mm x1	First aid kit, wall mountable x 1 per workshop
Tape insulation x 10 rolls	Textbook level 2 x15	Guillotine electrical 3mm, 1.2 m bed x1	Dust Coat x 1 per learner compulsory
Pipe Conduit PVC Inspection T – Round 20 mm x15 pieces	Textbook level 3 x15	Portable electrical drill, 220 V, 700 to 900 Watts, heavy duty	Safety sign: Safety Goggles at every workstation

Table for equipment needed			
Consumables	Non-Consumables	Tools	Equipment
		13mm chuck x2	
Pipe Conduit PVC Inspection T – Round 25 mm x 15 pieces	Textbook level 4 x15	Vice engineer 100 mm x4	Safety sign: Emergency Power cut-off switch at every workstation
Pipe Conduit PVC elbow 20 mm x 15 pieces	Switch isolator double pole 60 A x15 depends on your needs, according to your planning	Iron soldering Electric 25 Watt x15	Safety sign: No Running at every workstation
Pipe Conduit PVC elbow 25 mm x 15 pieces	Broom: 300 mm with soft bristles At least 1	Ruler, steel 300 mm x15	Safety sign: Arrow near every exit in the workshop
Pipe Conduit PVC gland 20 mm x 25 pieces	Broom: 600 mm with hard bristles at least 3	Scribe Engineer 200 mm x5	Safety sign: Ear muff at every workstation
Pipe Conduit PVC gland 25 mm x 25 pieces	Light fitting Bayonet Type PVC panel Mount x 20	Tape measuring, steel 3 m x5	Safety sign: Fire Extinguisher above every fire extinguisher
Pipe Conduit PVC T – Piece 20 mm x 15 pieces	Light switch Intermediate Panel mount x 20	Screw driver 100 mm x 4 mm flat x15	Safety sign: Exit above every exit
Pipe Conduit PVC T – Piece 25 mm x 15 pieces	Light switch One way Panel mount x 20	Screw driver 150 mm x 4 mm flat x15	Fire extinguisher, 9Kg Powder, Wall mountable at least one per workshop
Pipe Conduit PVC 4 m, 20 mm x 20 lengths	Light switch Two way Panel mount x 20	Screw driver 200 mm x 4 mm flat x15	Ear muff 2 for each person working on a noisy machine
Pipe Conduit PVC 4 m, 25	Circuit breaker	Phillips Screwdriver No	Safety goggles At least

Table for equipment needed			
Consumables	Non-Consumables	Tools	Equipment
mm x 20 lengths	miniature Rail mounted x 15 rails	1 x15	2 per machine you have in the workshop
Vero board sheet x 25 sheets	Switch Isolator double pole 60 A x 15	Phillips Screwdriver No 2 x15	Digital multimeterx15
Saddle PVC 20 mm Pack of 100 x 2 packs	Circuit breaker miniature Rail mounted 10 A x 5	Phillips Screwdriver No 3 x15	Megger insulation/continuity x2
Panel Wire 1,5 mm, 100 m Roll 12 strand wire x 7 rolls	Circuit breaker miniature Rail mounted 15 A x 5	Phillips Screwdriver No 4 x15	Clamp meter x5
Saddle PVC white Nail intype Norks Cable Pack of 100 – 2.5 mm x 2 packs	Circuit breaker miniature Rail mounted 20 A x 5	File hand, bastard, flat, smooth 150 mm x15	Plug polarity tester x10
Saddle PVC white Nail intype Norks Cable Pack of 100 – 4 mm x 2 packs	Circuit breaker miniature Rail mounted 25 A x 5	File hand, bastard, square, smooth 250 mm x15	Single Phase Induction motor x2
Saddle PVC white Nail intype Norks Cable Pack of 100 – 6 mm x 2 packs	Circuit breaker miniature Rail mounted 30 A x 5	File hand, bastard, half round 300 mm x15	
Self-tapping screws 16 mm x 4 mm x 100 per Pack x 3 packs	Circuit breaker: Earth leakage Protective device 220 V Single phase x 5	File hand, bastard, round 250 mm x15	
Flat bar 3mm x 4m x 5 lengths	Distribution Board Metal white 300 x 500 mm Surface mount with rail, Neutral bar and earth bar x 5	File hand, bastard, triangular 115 mm x15	

Table for equipment needed			
Consumables	Non-Consumables	Tools	Equipment
Lug crimp type Non Insulated 6mm Hole 100 per Pack – 1.5 mm x 5 packs		Hacksaw, 300 mm frame x15	
Lug crimp type Non Insulated 6mm Hole 100 per Pack – 2.5 mm x 5 packs		Hammer ballpeen x15	
Lug crimp type Non Insulated 6mm Hole 100 per Pack – 6 mm x 5 packs		Plier, Crimping for electrical lugs, 1-100 mm x15	
Panel wire 1.5 mm 100 m Roll 12 strand x 7 rolls		Plier combination, 200 mm x15	
Blade Hacksaw, 300 mm, 18T/25 mm x 15 blades		Plier diagonal cutter, 100 mm x15	
Blade Hacksaw, 300 mm, 24T/25 mm x 15 blades		Stripper, wire x15	
Blade Hacksaw, 300 mm, 32T/25 mm x 15 blades		Square engineer 100 mm x15	
Drill bit 0.8 mm with 3 mm Shaft Tungsten high speed x 15		Square engineer 200 mm x15	
Ferrol crimp type Non Insulated 100 per Pack 1.5 mm x 5 packs		Workbench with vice x15	
Ferrol crimp type Non Insulated 100 per Pack 2.5 mm x 5 packs		Pipe bending spring x15 20mm + 25mm	
Ferrol crimp type Non Insulated 100 per Pack 4		Solder sucker x15	

Table for equipment needed			
Consumables	Non-Consumables	Tools	Equipment
mm x 5 packs			
Ferrol crimp type Non Insulated 100 per Pack 6 mm x 5 packs		Hand Drills high speed 1 mm x 0.5 mm – 13 mm x3	
Light bulb Incandescent 60 W 240 V Bayonet type x 20		Utility knife x15	
Cable Norsk 3 core 100 m Roll 1.5 mm x 1		Long Nose pliers x 15	
Cable Norsk 3 core 100 m Roll 2.5 mm x 1			
Cable Norsk 3 core 100 m Roll 4 mm x 1			
Cable Norsk 3 core 100 m Roll 6 mm x 1			

Finances:

Budget and inventory

Electrical Technology is a subject that requires sustained support. Electrical Technologyworkshop requires regular resourcing for the purpose of completion of practical work as well as maintenance Resourcing could be sub divided into the following categories:

- Safety Equipment
 - Safety glasses
 - First aid kit
 - Dust jackets
 - Gloves
 - Fire extinguishers
 - Electrical protective equipment:
 - Earth leakage

- Over loads
 - Fuses
 - Isolator switches
- Tools and Equipment
 - Tools and equipment listed in the above equipment table
- Consumable Materials
 - Consumable materials listed in the above equipment table
- Practical Resources
- Teaching and Learning Support Material
 - A textbook for each learner
 - Workshop tools and equipment
 - A calculator for each learner
 - Measuring instruments
- Maintenance

School management teams (SMT) at schools offering Electrical Technology should take note of the implications that the Electrical Technology workshop has on the budget of the school. Whilst it is common practice to provide a working budget to a workshop, it is imperative to note that the budget should be structured to not only cater for the completion of PAT by the learners, but it should also allow for the teacher to replenish tools and equipment, acquire consumable materials, maintenance of training equipment on a regular basis as well as provisioning for the inevitable failure of equipment should not be disregarded; maintenance can be classified as the following:

- Corrective maintenance: Can be seen as any maintenance task that is done to identify, isolate and rectify any fault on failed equipment, machines or systems. So that the equipment, machines or systems can be restored to operational conditions.
- Preventative maintenance: Is maintenance that is done on equipment, machines or systems on a regular basis to ensure that they stay in a good working condition.

The SMT of a school should have in place a plan to regularly repair or phase out and replace obsolete equipment and tools.

2.5 Career opportunities.

Career and occupational opportunities for learners with a foundation in electrical technology include but is not limited to:

- Assistant electrician
- Assistant electrical service technician
- Assistant Wiremen
- Appliance repairmen
- Installer technician
- Electrician
- Electrical service technician
- Wiremen

SECTION 3:

OVERVIEW OF TOPICS PER TERM AND ANNUAL TEACHING PLANS

3.1 Content overview

TOPIC	Year 1	Year 2	Year 3	Year 4
1. Health and Safety	General workshop rule and procedures Housekeeping Evacuation plan Importance of wearing protective gear Safety signs and installation rules HIV and Aids and awareness of substance abuse	Importance of wearing protective gear Know safety Precautions when using general tools and equipment Safety signs and installation rules HIV and Aids and Awareness of Substance abuse	Know safety Precautions when using tools and equipment Know safety precautions when using general tools and equipment Apply basic principles of Health and Safety on the Electrical installation	Know safety precautions when using tools and equipment Apply basic principles of Health and Safety on the Electrical installation
2. First Aid	Apply basic first Aid principles	Apply basic first Aid principles	Apply basic first Aid principles	Apply basic first Aid basic principles

TOPIC	Year 1	Year 2	Year 3	Year 4
3. Tools	Identify and use of tools	Identify and use of tools	Identify, use and maintain tools	Identify, use and maintain tools
4. Basic principles of electricity		Atomic theory Explanation of conventional current flow List the SI units with the quantity symbol, unit and unit symbol	Atomic theory Introduction to Ohms Law Simple calculations	Atomic theory List SI units with the quantity symbol, unit and unit symbol. Simple calculations
5. Electrical Measuring Instruments	Identify and use the tools / measuring instruments	Identify, use and maintain the tools / measuring instruments	Identify, use and maintain the tools / measuring instruments	Identify, use and maintain the tools / measuring instruments
6. Power sources		Different electrical energy sources. Primary vs Secondary cells Block diagram of a power supply	Basic battery charger AC Generation	Regulated power supply

TOPIC	Year 1	Year 2	Year 3	Year 4
7. Electrical circuits and components		<p>Identify symbol and Components</p> <p>Test components and measure components with a multimeter</p> <p>Identify the value of the component</p> <p>Series circuits consisting of two resistors</p>	<p>Identify symbol and components</p> <p>Test components and measure components with a multimeter.</p> <p>Identify the value of the component</p> <p>Parallel circuits consisting of two resistors</p>	<p>Identify symbols and components</p> <p>Test components and measure components with a multimeter</p> <p>Identify the value of the component</p> <p>Build a simple circuit containing the components</p>

TOPIC	Year 1	Year 2	Year 3	Year 4
8. Conductors and Cables	Definition of a conductor Types of conductor Cable installation	Definition of a conductor Types of conductor Cable installation	Conductor joining and reticulation methods Soldering principles Jointing method Insulation Types of conductor Cable installation	Conductor joining and reticulation methods Use of crimping tools Reticulation methods Jointing method Insulation Types of conductor Cable installation
9. Domestic Installations	Simulated Installation	Simulated cable installation Plug polarity. Continuity testing Installation testing	Geyser sub circuit Stove sub circuit The stove Continuity testing Insulation testing Fault finding in home appliances	Connection to the supplier Domestic Installations components Day night switch Fluorescent lights

TOPIC	Year 1	Year 2	Year 3	Year 4
10. Electrical Motors and Transformers	Introduction to electrical motors Purpose of meters	Introduction to transformers Introduction to electrical motors Testing Electrical inspection. Visual inspection Mechanical inspection. Trouble shooting	Switching and control Direct on line single phase Variations - induction motor	Introduction of three phase motors Difference between star and delta Transformer testing

3.2 CONTENT OUTLINE PER TERM

Year 1

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1	Health and Safety <u>Date:</u>	<p>Be aware of the dangers of HIV and Aids and how it is transmitted.</p> <p>Be aware of different types of substance abuse and the effects of substance abused in the workplace.</p> <ul style="list-style-type: none"> • Drinkable substances • Inhalable • Injectable <p>Name and identify the following protective clothing (PPE):</p> <ul style="list-style-type: none"> • Overalls • Safety glasses • Working gloves • Safety boots • Safety Helmet <p>Demonstrate the understanding of the following:</p> <ul style="list-style-type: none"> • Unsafe acts 	<p>Theoretical explanation as well as practical demonstrations</p> <p>Activities:</p> <p>Examples:</p> <p>Wear, identify and name different types of protective clothing. (oral test)</p> <p>State the use of protective clothing. (Oral test)</p> <p>Design their own safety sign</p> <p>List examples of unsafe acts and conditions</p> <p>Resources:</p> <p>Examples:</p> <p>PPE, DVD's about safety, charts</p>

		<ul style="list-style-type: none"> Unsafe conditions 	
2	First Aid Date: <hr/>	Basic First Aid <ul style="list-style-type: none"> Describe basic first aid Identify basic components in a first aid kit Describe AIDS and HIV as infectious diseases Describe the prevention of spreading of HIV and Aids when treating a person that is bleeding Signs and symptoms of electrical shock First aid steps to take when someone is electrocuted CPR Practical: Perform the required First Aid Exercises	Theoretical explanation as well as practical demonstrations Activities: Examples: Identify and name different items on the First Aid kit.(Worksheet) State the use of each item. (oral test) Perform the different first aid exercises Resources: Examples: First Aid Kit, DVD's about Injuries, Burns, Fractures and charts
3-5	Tools and instruments Date: <hr/>	Identification of parts and functions including care and safe use of: <ul style="list-style-type: none"> Side cutter Long nose plier Combination plier Flat screwdriver Phillips screwdriver Automatic wire stripper Ruler Measuring tape Square engineer 	Theoretical explanation as well as practical demonstrations Activities: Examples: Learners are given a worksheet as either classwork or homework Learners demonstrate the correct use of the tools. Resources: Hand tools

		<ul style="list-style-type: none"> • Scriber • Bending spring • Hacksaw • Engineers vice • Fish tape <p>Introduction to the cutting of material:</p> <ul style="list-style-type: none"> • Cutting tools • Cutting Techniques for different materials • Cutting of PVC conduit <p>Introduction to the multimeter</p> <p>Use of multimeter as:</p> <ul style="list-style-type: none"> • Voltmeter • Ammeter • Continuity tester <p>Practical Skills and Techniques</p> <p>Conduct measurement of:</p> <ul style="list-style-type: none"> • Voltage measurements • Current measurements • Continuity tests • Safe and correct use of tools 	
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6	Conductors and cables Date: <hr/>	<ul style="list-style-type: none"> • Definition of a conductor • Identify the types <p>Household cable:</p> <ul style="list-style-type: none"> • Twin flex • Surfex (two core and earth) • Cab tire • GP wire • Panel wire 	<p>Theoretical explanation as well as practical demonstrations</p> <p>Activities:</p> <p>Example:</p> <p>Defining, listing in a worksheet</p> <p>Practical differentiation between types (oral)</p> <p>Strip different types of cables</p> <p>Connect different types of cables</p> <p>Installation of cables (practical)</p> <p>Cutting pipes (PVP)</p> <p>Bending pipes (PVC)</p> <p>Fitting glands</p> <p>Connecting connection boxes</p> <p>Resources:</p> <p>Different types of cables</p> <p>Tools needed for installation of cables including cutting</p>
7-8	Domestic installations Date: <hr/>	<p>Simulated light and plug installations:</p> <ul style="list-style-type: none"> • Light circuits 1.5 mm² <ul style="list-style-type: none"> ○ One light one switch ○ Two lights (parallel) one switch • Plug circuits 2.5 mm² (Socket outlet) <ul style="list-style-type: none"> ○ Two plugs <p>Introduction to distribution board components:</p> <ul style="list-style-type: none"> • Main circuit breaker 	<p>Theoretical explanation as well as practical demonstrations</p> <p>Activities:</p> <p>Examples:</p> <p>Knowing the purpose of a MCB</p> <p>Identify a MCB and where its used</p> <p>Building light and plug circuits on simulation boards</p> <p>Resources:</p> <p>Wiring boards</p>

		<ul style="list-style-type: none"> • Earth leakage • Miniature circuit breaker • Earth bar • Neutral bar • Purpose <p>Practical Skills and Techniques</p> <p>Connect the following circuits:</p> <ul style="list-style-type: none"> • Light circuits 1.5 mm² <ul style="list-style-type: none"> ▪ One light one switch ▪ Two lights (parallel) one switch • Plug circuits 2.5 mm² (Socket outlet) <ul style="list-style-type: none"> ▪ Two plugs • Demonstration of the wiring of a distribution board (the teacher demonstrates the wiring of a distribution board) 	<p>Components for the building of the circuits</p> <p>Multimeter</p> <p>Wire</p> <p>Tools for wiring</p>
8	<p>Electrical motors and transformers</p> <p>Date:</p> <hr/>	<p>Introduction to electrical motors:</p> <ul style="list-style-type: none"> • Purpose • Components <ul style="list-style-type: none"> ▪ Dismantling and assembling a capacitor start induction motor ▪ Identifying the different components of a capacitor start motor 	<p>Activities:</p> <p>Example:</p> <p>Identify the purpose of an electrical motor</p> <p>Demonstrate the dismantling and assembling of a motor</p> <p>Identify the components.</p> <p>Resources:</p>

		<p>Practical Skills and Techniques</p> <ul style="list-style-type: none"> • Dismantling and assembling • Identifying the different components 	<p>Electrical motors</p> <p>Electrical motors' components</p> <p>Equipment and tools for dismantling of electrical motors</p>
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9-10	Formal Assessment Date: <hr/>	<p>The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting</p>
<p>Activity 1: - PRACTICAL ASSESSMENT TASK – PAT (Practical project) 100 Marks = 50% of term mark</p> <p>Do a simulated Distribution board wiring task.</p> <p>Activity 2: - Practical work 50 Marks = 25% of term mark</p> <p>Dismantle and assemble an electrical motor and identify the different components.</p> <p>Activity 3: - Formal written or oral assessment 50 Marks = 25%</p> <p>Year 1, Term Test</p> <p>Question 1 - Health and safety, 5 Marks</p> <p>Question 2 - First Aid, 5 Marks</p> <p>Question 3 - Tools and instruments, 20 Marks</p> <p>Question 4 - Conductors and Cables, 5 Marks</p> <p>Question 5 - Domestic installations 15 Marks</p>		

Term mark

Practical, 150 marks, 75%

Theoretical, 50 marks, 25%

Year 2 Term 1

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1	Health and Safety Date: <hr/>	Revision <p>Be aware of the dangers of HIV and Aids and how it is transmitted</p> <p>Be aware of different types of substance abuse and the effects of substance abused in the workplace</p> <p>Name and identify the following protective clothing(PPE):</p> <ul style="list-style-type: none"> • Overalls • Safety glasses • Working gloves • Safety boots • Safety Helmet <p>Know the importance of wearing protective gear</p> <p>Be aware of the safety precautions when using general tools and equipment</p> <p>Demonstrate the following:</p> <ul style="list-style-type: none"> • Unsafe acts 	<p>Theoretical explanation as well as practical demonstrations</p> <p>Activities:</p> <p>Examples:</p> <p>Wear ,identify and name different types of protective clothing.(oral test)</p> <p>State the use of protective clothing. (Oral test)</p> <p>Design their own safety sign</p> <p>List examples of unsafe acts and conditions</p> <p>Resources:</p> <p>Examples:</p> <p>PPE, DVD's about safety, charts</p>

		<ul style="list-style-type: none"> Unsafe conditions <p>Identify the following:</p> <ul style="list-style-type: none"> Safety signs <ul style="list-style-type: none"> Glasses Gloves Dust Jackets Fire Extinguishers Exit signs Installation rules <ul style="list-style-type: none"> Low voltage installations SANS 10142-1:2008 	
2	First Aid Date: <hr/>	Basic First Aid <ul style="list-style-type: none"> Describe basic first aid Identify basic components in a first aid kit Describe AIDS and HIV as infectious diseases Describe the prevention of spreading of HIV and Aids when treating a person that is bleeding Signs and symptoms of electrical shock First aid steps to take when someone is electrocuted Treatment of burn wound and Fracture <p>Practical: Perform the required First Aid Exercises</p>	<p>Theoretical explanation as well as practical demonstrations</p> <p>Activities:</p> <p>Examples:</p> <p>Identify and name different items on the First Aid kit. (Worksheet)</p> <p>State the use of each item. (oral test)</p> <p>Perform the different first aid exercises</p> <p>Resources:</p> <p>Examples:</p> <p>First Aid Kit, DVD's about Injuries, Burns, Fractures and charts</p>

3	Tools Date: <hr/>	Identification of parts and functions including care and safe use of: <ul style="list-style-type: none"> • Side cutter • Long nose plier • Combination plier • Flat screwdriver • Phillips screwdriver • Automatic wire stripper • Ruler 	<p>Theoretical explanation as well as practical demonstrations</p> <p>Activities: Examples: Learners are given a worksheet as either classwork or homework. Identify different tools Demonstrate the correct use of the tools</p> <p>Resources: Hand tools</p>
4	Tools Date: <hr/>	Identification of parts and functions including care and safe use of: <ul style="list-style-type: none"> • Measuring tape • Square engineer • Scriber • Bending spring • Hacksaw • Engineers vice • Fish tape 	<p>Theoretical explanation as well as practical demonstrations</p> <p>Activities: Examples: Learners are given a worksheet as either classwork or homework Identify different tools Demonstrate the correct use of the tools.</p> <p>Resources: Hand tools</p>

5	Tools Date: <hr/>	Identification of parts and functions including care, maintenance and safe use of: <ul style="list-style-type: none"> • Soldering iron • Solder sucker • Utility knife • Multimeter • Reamer • Hickey • Stock and dies • File • Megger 	<p>Theoretical explanation as well as practical demonstrations</p> <p>Activities:</p> <p>Examples:</p> <p>Learners are given a worksheet as either classwork or homework</p> <p>Identify different tools</p> <p>Demonstrate the correct use of the tools.</p> <p>Resources:</p> <p>Hand tools</p>
6	Tools Date: <hr/>	<p>Cutting material:</p> <ul style="list-style-type: none"> • Cutting metal • Cutting steel conduit • Cutting PVC conduit <p>Practical</p> <p>Cut steel conduit to size</p> <p>Use the reamer to remove burs on steel conduit</p> <p>Making threads on steel conduit</p> <p>Use the stock and dice to make thread</p>	<p>Theoretical explanation as well as practical demonstrations</p> <p>Activities:</p> <p>Examples:</p> <p>Give learners materials to cut with different tools</p> <p>Use a reamer to remove burs from steel conduit</p> <p>Use the stock and die to make a thread</p> <p>Resources:</p> <p>Hand tools</p>

7	Tools Date: <hr/>	Learners are given a design where they have to copy the design: <ul style="list-style-type: none"> • Cutting the metal according to the design • Filing for accuracy • Drilling holes 	<p>Theoretical explanation as well as practical demonstrations</p> <p>Activities:</p> <p>Give a design where they have to copy the design and do the design practically</p> <p>Resources:</p> <p>Hand tools, Metal</p>
8	Tools Date: <hr/>	<p>Learners are given a design where they have to copy the design:</p> <ul style="list-style-type: none"> • Cutting the metal according to the design • Filing for accuracy • Drilling holes <p>Identify different tools and material used for soldering.</p> <ul style="list-style-type: none"> • Soldering iron • Solder sucker • Conductive material <p>Solder pieces of conductors onto a Vero board.</p> <p>Design a square shape mat out of conductor wire and solder the wires together</p>	<p>Theoretical explanation as well as practical demonstrations</p> <p>Activities:</p> <p>Example:</p> <p>Identification of tools and materials</p> <p>Soldering of conductors to a Vero board</p> <p>Soldering a Square shaped mat</p> <p>Give a design where they have to copy the design and do the design practically.</p> <p>Resources:</p> <p>Hand tools, Metal, Soldering iron, solder, Solder sucker, Conductor wire,</p> <p>Vero board</p>

9-10	Formal assessment Date: <hr/>	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting.
<p><u>Activity 1:</u> - Practical Demonstration 50 Marks = 15% of term mark</p> <p>Demonstrate the first aid steps to be taken when someone is electrocuted</p> <p><u>Activity 2:</u> - PRACTICAL ASSESSMENT TASK – PAT (Practical project) 50 Marks = 20% of term mark</p> <p>Solder a design given to you using wire. (Soldering mat, pyramid or cube)</p> <p><u>Activity 3:</u> - PRACTICAL ASSESSMENT TASK – PAT (Practical project) 50 Marks = 40% of term mark</p> <p>Copy a model given to you on a piece of metal using a file, hacksaw and drill</p> <p><u>Activity 4:</u> - Formal written or oral assessment 50 Marks – 25%</p> <p>Year 2, Term 1 test</p> <p>Question 1 - Health and Safety, 5 Marks</p> <p>Question 2 - First aid, 5 Marks</p> <p>Question 3 - Tools, 40 Marks</p> <p><u>Term mark</u></p> <p>Practical, 150 marks, 75%</p> <p>Theoretical, 50 marks, 25%</p>		

Year 2 Term 2

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1	Basic principles of electricity Date: 	Atomic theory: Explanation of conventional current flow List SI units for: <ul style="list-style-type: none"> • Voltage • Current • Resistance • Energy • Power • with the quantity symbol and unit symbol Introduction of basic electric circuit	Theoretical explanation Activities: Example: Identify SI units (quantity symbol, unit and unit symbol) Resources: Textbook
1-2	Electrical measuring instruments Date: 	Identification of following instruments: <ul style="list-style-type: none"> • Volt meter • Ammeter • Ohm meter • Continuity tester • Multimeter Adhere to the safety measures when using the following	Theoretical explanation as well as practical demonstrations Activities: Example: Identify and learn the safety precautions of the instruments and use an ammeter, Ohm meter, continuity tester and multimeter for basic measurements

		instruments: <ul style="list-style-type: none"> • Volt meter • Ammeter • Ohm meter • Continuity tester • Multimeter Use of the following instruments for basic measurements: <ul style="list-style-type: none"> • Volt meter • Ammeter • Ohm meter • Continuity tester • Multimeter 	<p>Demonstrate the best and safe way to use the different tools</p> <p>Resources: A Multimeter or</p> <ul style="list-style-type: none"> • Volt meter • Ammeter • Ohm meter • Continuity tester
3	Power Sources Date: <hr/>	Energy: What is energy? Sources of energy: <ul style="list-style-type: none"> • Coal energy • Wind energy • Nuclear energy • Hydro electricity • Solar energy Storing of energy	<p>Theoretical explanation and video demonstrations</p> <p>Activities:</p> <p>Example:</p> <p>Identification of sources of energy with a worksheet</p> <p>Differentiate between primary and secondary cells oral or a worksheet</p> <p>Identify the block diagram of a power supply</p> <p>Drawing a block diagram of a basic power supply</p> <p>Resources</p>

		Primary vs Secondary cells: <ul style="list-style-type: none"> • Difference • Advantages and disadvantages <p>Alternative energy</p> <ul style="list-style-type: none"> • Solar cells and panels <p>Safety considerations</p> Power supply (Block diagram) <ul style="list-style-type: none"> • Identification of a power supply block diagram • Drawing of a power supply block diagram 	<p>Examples of primary and secondary cells</p> <p>Practical power supply</p> <p>Videos of different sources of energy</p>
4-7	Electrical circuits and components. Date: _____	Identify the components, symbols, units and function of: <ul style="list-style-type: none"> • Resistor • Thermistor • Incandescent Light • Fuse • Coil • Variable resistor • Conductor joint • Conductors that cross • Earth connection • Single pole switch • Two way switch • Isolator 	<p>Theoretical explanation as well as practical demonstrations</p> <p>Activities:</p> <p>Example:</p> <p>Identify components, symbols, units and functions</p> <p>Testing and measuring of components</p> <p>Identifying values of components</p> <p>Building circuits</p> <p>Identify symbols</p> <p>Draw symbols</p> <p>Draw circuits using symbols</p>

		<ul style="list-style-type: none"> • Push to make switch • Push to break • Cell • Battery • Voltmeter • Ammeter • Ohmmeter • Lightning arrestor • AC supply • DC supply • Buzzer • Motor <p>Practical</p> <p>Use the symbols above to draw practical circuits.</p> <p>Test and measure the components where applicable</p> <p>Identify the value of the components where applicable</p> <p>Build a circuit consisting of one resistor</p> <p>Build a series circuits consisting of two resistors</p>	<p>Resources</p> <p>Different components</p> <p>Measuring instruments</p>
8	<p>Revision</p> <p>Date:</p> <hr/>	<p>Revision</p> <p>Do revision of the following topics:</p> <ul style="list-style-type: none"> • Health and safety • First Aid • Tools and instruments 	<p>Theoretical explanation and practical demonstration</p> <p>Activities:</p> <p>Example:</p>

		<ul style="list-style-type: none">• Basic principles of electricity• Electrical measuring instruments• Power sources• Electrical circuits and components	Answering worksheets Practical demonstrations Building circuits
9-10	Formal Assessment Date:	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting	

Activity 1: - Demonstration 50 Marks = 25% of term mark

Test different electrical and electronic components using a multimeter

Activity 2: - PAT (Practical project) 50 Marks = 25% of term mark. (May be a continuation of PAT started in term 1 or a completely new project)

This project must be finished by the end of term 2

Build a simple circuit containing a resistor

Activity 3: - PAT (Practical project) 50 Marks = 25% of term mark. (May be a continuation of PAT started in term 1 or a completely new project)

This project must be finished by the end of term 2

Build a simple series circuit containing two resistors

Activity 4: - Formal written test or oral assessment **65 Marks, converted to 50** – 25%

Scope of work is all the work done during term 1 and term 2

Year 2, Term 2 Exam

Question 1 - Term 1 work: - Health and Safety, 5 Marks

- First Aid, 5 Marks

- Tools, 5 Marks

Question 2 - Basic principles of electricity & Electrical measuring instruments, 10 Marks

Question 3 - Power Sources, 5 Marks

Question 4 - Electrical circuits and components, 35 Marks

Term mark

Practical, 150 marks, 75%

Theoretical, 50 marks, 25%

Year 2 Term 3

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1-3	Conductors and cables Date: <hr/>	Revision: Do revision on: <ul style="list-style-type: none"> • Definition of a conductor. • Identify the types and the installation process of the following conductors (household cables): <ul style="list-style-type: none"> • Twin flex • Surfex (two core and earth) • Cab tire • GP Wire • Panel wire Conduction material: <ul style="list-style-type: none"> • List of conducting materials: <ul style="list-style-type: none"> ○ Copper ○ Silver ○ Gold ○ Aluminum • Identify the advantages of using copper • Identify the disadvantages of using silver, gold and aluminum 	Theoretical explanation as well as practical demonstrations Activities: Example: Defining, listing, advantages and disadvantages in a worksheet Practical differentiation between types (oral) Installation of cables (practical) Resources: Different types of cables Tools needed for installation of cables including cutting and chasing

		<p>Cable installation:</p> <ul style="list-style-type: none"> • Pipe work (PVC) • Glands (Plastic) • Connection boxes (domestic) • Drawing of cables • Surface mount: <ul style="list-style-type: none"> ○ Marking ○ Cutting <p>Difference between solid core and multi-strand cables</p> <p>Identify the types and the installation process of the following conductors:</p> <ul style="list-style-type: none"> • Household cable: <ul style="list-style-type: none"> • Twin flex • Surfex (two core and earth) • Cab tire • General Purpose Wire • Panel wire <p>Practical</p> <p>Cable installation</p> <ul style="list-style-type: none"> • Pipe work (PVC) • Glands (plastic) • Connection boxes (domestic) • Trunking • Drawing of cables 	
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		<ul style="list-style-type: none"> • Surface mount and flush mount: <ul style="list-style-type: none"> • Marking • Cutting • Chasing 	
4-8	Domestic installations Date: <hr/>	Revision: Do revision on the following: <ul style="list-style-type: none"> • Introduction to Miniature circuit breaker (MCB) <ul style="list-style-type: none"> ○ Purpose ○ Identify breaker values ○ use of MCB • Light circuits 1.5 mm² <ul style="list-style-type: none"> ○ One light one switch ○ Two lights one switch (parallel) • Plug circuits 2.5 mm² (Socket outlet) <ul style="list-style-type: none"> ○ Two plugs Practical Simulated light circuit and plug installations (Done on panel wiring boards) Light circuits 1.5 mm²: <ul style="list-style-type: none"> • One light one switch • Two lights one switch (parallel) 	Theoretical explanation as well as practical demonstrations Activities: Building of light and plug circuits on panel wiring boards Resources: Panel wire boards Components for building of different circuits Plug tester Multimeter

		<ul style="list-style-type: none"> • Two way switches controlling one light • Two way switches controlling two lights • Intermediate switching controlling one light • Intermediate switching controlling two lights <p>Plug circuits 2.5 mm² (Socket outlet)</p> <ul style="list-style-type: none"> • One plug • Three plugs <p>Installation testing:</p> <ul style="list-style-type: none"> • Plug polarity <ul style="list-style-type: none"> ▪ Using a plug tester to check your plug polarity • Continuity testing and short circuit testing <ul style="list-style-type: none"> ▪ Using a multimeter to test continuity of cables ▪ Using a multimeter to test short circuits 	
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9-10	Formal Assessment Date: <hr/>	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting
<p><u>Activity 1:</u> - PAT (Practical task) 50 Marks = 25% of term mark</p> <p>Demonstrate different PVC pipe bends</p> <p><u>Activity 2:</u> - PAT (Practical task) 50 Marks = 20% of term mark (A completely new project must be started in term 3)</p> <p>Wire a two way light circuit</p> <p><u>Activity 3:</u> - PAT (Practical task) 50 Marks = 30% of term mark (A completely new project must be started in term 3)</p> <p>Wire an intermediate light circuit</p> <p><u>Activity 4:</u> - Formal written or oral assessment 50 Marks – 25%</p> <p>Scope of work is all the work done during term 3</p> <p>Year 2, Term 3 Test</p> <p>Question 1 - Conductors and Cables 20 Marks</p> <p>Question 2 - Domestic installations 30 Marks</p> <p><u>Term mark</u></p> <p>Practical, 150 marks, 75%</p> <p>Theoretical, 50 marks, 25%</p>		

Year 2 Term 4

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1-6	Electrical motors and transformers Date: _____	Introduction to transformers: <ul style="list-style-type: none"> • Purpose • Identification • Application • Testing Introduction to electrical motors: <ul style="list-style-type: none"> • Purpose • Identification: <ul style="list-style-type: none"> ○ Universal ○ Capacitor start ○ Capacitor start and run • Application: <ul style="list-style-type: none"> ○ Pump motor Practical Universal Motor <ul style="list-style-type: none"> • Mechanical test • Electrical test • Visual inspection 	Theoretical explanation as well as practical demonstrations Activities: Example: Identification of a transformer (oral and worksheet) Testing (practical) Resources: Example of a transformer Multimeter

		<p>Capacitor start</p> <ul style="list-style-type: none"> • Mechanical test • Electrical test • Visual inspection <p>Capacitor start and run</p> <ul style="list-style-type: none"> • Mechanical test • Electrical test • Visual inspection <p>Trouble shooting</p> <p>Pump installation</p>	
7	<p>Revision</p> <p>Date:</p> <hr/>	<p>Revision</p> <p>Do revision on topics:</p> <ul style="list-style-type: none"> • Conductors and cables • Domestic installations • Electrical motors and transformers 	<p>Theoretical explanation as well as practical demonstrations</p> <p>Activities:</p> <p>Answering worksheets</p> <p>Building circuits</p> <p>Doing wiring</p> <p>Dismantling and assembling motors and transformers</p>

8-10	Formal Assessment Date: <hr/>	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting
<p>Activity 1: - PAT (Practical task) 50 Marks = 25% of term mark</p> <p>Using a multimeter and meggar test a transformer</p> <p>Activity 2: - PAT (Practical project) 100 Marks = 50% of term mark</p> <p>Using a multimeter and meggar test a transformer. Do a mechanical and visual inspection</p> <p>Activity 3: - Formal written or oral assessment 65 Marks converted to 50 – 25%</p> <p>Scope of work is all the work done during term 3 and 4</p> <p>Year 2, Term 4 Examination</p> <p>Question 1 - Term 3 Work: - Conductors and cables, 6 Marks - Domestic installations, 9 Marks</p> <p>Question 2 - Electrical motors and transformers 50 Marks</p> <p>Term mark</p> <p>Practical, 150 marks, 75%</p> <p>Theoretical, 50 marks, 25%</p>		

Year 3 Term 1

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1	Health Safety (OHS Act) Date: <hr/>	Responsibilities Identify the following signs in the electrical workshop <ul style="list-style-type: none"> Prohibition Signs: <ul style="list-style-type: none"> No-Entry sign Don't use water as an extinguisher No smoking No loose clothing permitted at this station Fire Safety Signs: <ul style="list-style-type: none"> Location of a fire blanket Location of fire fighting equipment Fire hose Fire hydrant Fire extinguisher Fire alarm Hand held emergency alarm Sprinkler stop valve Regulatory Signs: <ul style="list-style-type: none"> Eye protection Respiratory protection Head protection 	Theoretical explanation Activities: Example: Demonstrate meaning of the following signs and examples of the signs that may be present in the electrical workshop: <ul style="list-style-type: none"> Prohibition Signs Fire Safety Signs Regulatory Signs Information Signs Safety Signs Identify examples of each of the above signs Demonstrate the dangerous practices and housekeeping principles Resources: Safety signs

		<ul style="list-style-type: none"> ▪ Hearing protection ▪ Hand protection ▪ Dust jacket mandatory ▪ Keep area clean • Information Signs: <ul style="list-style-type: none"> ▪ Escape route ▪ Emergency telephone ▪ First aid equipment ▪ Electric isolator switch ▪ General direction • Safety Signs: <ul style="list-style-type: none"> ▪ Electric shock hazard ▪ Fire hazard ▪ Warning of moving machinery <p>Dangerous practices</p> <p>Housekeeping Principles</p>	
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2	First Aid Date: <hr/>	Revision: Do revision of the following: <ul style="list-style-type: none"> • Basic first aid principles • What to do in case of electrical shock • Recognise and treatment of shock • Steps to follow when treating: <ul style="list-style-type: none"> ▪ A burn ▪ A fracture • Steps to follow when someone is bleeding 	Theoretical explanation as well as practical demonstrations Activities: Demonstrate first aid skills practically Resources: Basic first aid kit
3	Tools Date: <hr/>	Revision: Identification of parts and functions including care and safe use of: <ul style="list-style-type: none"> • Side cutter • Long nose plier • Combination plier • Flat screwdriver • Phillips screwdriver • Automatic wire stripper • Ruler • Measuring tape • Square engineer • Scriber • Bending spring 	

		<ul style="list-style-type: none"> • Hacksaw • Engineers vice • Fish tape • Soldering iron • Solder sucker • Utility knife • Multimeter • Reamer • Hickey • Stock and dies • File • Meggar 	
4-5	Tools Date: <hr/>	Power tools <ul style="list-style-type: none"> • Identify the function and Safe use (PPE) of the following power tools: <ul style="list-style-type: none"> • Angle grinder • Bench grinder • Hand drill • Drill press • Identify the function and installation of blades: <ul style="list-style-type: none"> ▪ Cutting disk <ul style="list-style-type: none"> ▪ Concrete ▪ Steel 	Theoretical explanation as well as practical demonstrations Activities: Example: Demonstrate the proper PPE and safe use for the tools Use the grinders to cut material and walls for chasing Use the drills to drill holes into material Resources: Power tools Material to cut

		<ul style="list-style-type: none"> Grinding disk Flap disk Identify function and installation of drill bits: <ul style="list-style-type: none"> Concrete Steel Wood <p>Practical</p> <ul style="list-style-type: none"> Use a grinder to cut different materials. Use a grinder and a hammer and chisel to chase walls 	
6-7	<p>Basic principles of electricity and electrical measuring instruments</p> <p>Date:</p> <hr/>	<p>Revision</p> <p>Atomic theory:</p> <ul style="list-style-type: none"> Introduction to Ohms Law Simple calculations: ($R=V/I$, $I=V/R$, $V=IxR$) Resistors in series Resistors in parallel (Two resistors) <p>Practical</p> <ul style="list-style-type: none"> Build simple circuits and measure using multimeter <p>Electrical measuring instruments:</p> <ul style="list-style-type: none"> Revision of the insulation(meggar)meter 	<p>Theoretical explanation as well as practical demonstrations</p> <p>Activities:</p> <p>Example:</p> <p>Ohms Law calculations</p> <p>Building circuits</p> <p>Measurement of current, voltage and resistance using a multimeter to prove Ohms Law</p> <p>Resources:</p> <p>Components for building circuits</p> <p>Multimeter</p> <p>Meggar</p>

		<ul style="list-style-type: none"> Application and safe use of the meggar meter 	
7	Power sources Date: _____	Basic battery charger: <ul style="list-style-type: none"> Identify the components of a basic battery charger Dismantle and assemble a basic battery charger 	Theoretical explanation as well as practical demonstrations Activities: Example: Identifying and listing of a basic battery charger Resources: Circuit of a battery charger Model of a battery charger
8	Electrical circuits and components Date: _____	Revision Identify the Components, symbols, units and function of: <ul style="list-style-type: none"> Capacitor Diode LED Thermistor Test the components and measure with a multimeter. Identify the value of the component. Build a simple circuit containing the components	Theoretical explanation as well as practical demonstrations Activities: Example: Identify components, symbols, units and functions Testing and measuring of components Identifying values of components Building circuits Resources Different components

		Diode and LED What happens during: <ul style="list-style-type: none"> • Forward bias • Reverse bias 	Measuring instruments Notes: The diode and LED must be in forward and reverse bias mode
9-10	Formal Assessment Date: <hr/>	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting	

Activity 1: - Practical task 50 Marks = 25% of term mark

Design and make a safety sign

Activity 2: - PAT (Practical project) 100 Marks = 50% of term mark

Build simple circuit to prove Ohm's Law

Activity 3: - Formal written or oral assessment 50 Marks – 25%

Scope of work is all the work done during the term.

Year 3, Term 1 Test

Question 1 - Health and Safety, 5 Marks

Question 2 - First Aid, 5 Marks

Question 3 - Tools, 20 Marks

Question 4 - Basic principles of electricity & Electrical measuring instruments, 10 Marks

Question 5 - Power sources, 5 Marks

Question 6 - Electrical circuits and components, 5 Marks

Term mark

Practical, 150 marks, 75%

Theoretical, 50 marks, 25%

Year 3 Term 2

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1-7	Conductors and cables Date: _____	Conductor joining and reticulation methods: Soldering principles Joining method: <ul style="list-style-type: none"> Soldered joints Insulation: <ul style="list-style-type: none"> Identify the types of insulation Advantages and disadvantages of the different types of insulation. Types of conductor: <ul style="list-style-type: none"> Light industrial cables Non-Armoured Cable installation: <ul style="list-style-type: none"> Pipe work (steel) Glands (steel) Connection boxes (Light industrial) Power skirting's Surface mount and flush mount: <ul style="list-style-type: none"> Marking 	Theoretical explanation as well as practical demonstrations Activities: Examples: Soldering of joints Joining of cables Identifying of insulation Identifying advantages and disadvantages Doing installation work with different material Installation of cables (practical) Demonstration joining conductors with plug top pins. Resources: Different types of cables Different types of insulation Tools needed for installation of cables including cutting and chasing

		<ul style="list-style-type: none"> • Cutting • Chasing <p>Practical</p> <p>Soldering of joints</p> <p>Installation of cables</p> <ul style="list-style-type: none"> • Surface mounted • Flush mounted 	
8	<p>Revision</p> <p>Date:</p> <hr/>	<p>Revision:</p> <p>Do revision of the following topics:</p> <ul style="list-style-type: none"> • Health and safety • First Aid • Tools and instruments • Basic principles of electricity • Electrical measuring instruments • Power sources • Electrical circuits and components • Conductors and cables 	<p>Theoretical explanation and practical demonstration</p> <p>Activities:</p> <p>Example:</p> <p>Answering worksheets</p> <p>Practical demonstrations</p> <p>Building circuits</p>

9-10	Formal Assessment Date: <hr/>	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting
<p><u>Activity 1:</u> - Practical Task 50 Marks = 25% of term mark</p> <p>Do cable joints using different soldering techniques</p> <p><u>Activity 2:</u> - PAT (Practical project) 100 Marks = 50% of term mark</p> <p>Do a simulated domestic installation using metal conduit</p> <p><u>Activity 3:</u> - Formal written or oral assessment <u>65 Marks Converted to 50</u> – 25%</p> <p>Scope of work is all the work done during term 1 and term 2.</p> <p>Year 3, Term 2 Examination</p> <p>Question 1 - Term 1 Work: - Health and Safety, First Aid and Tools, 5 Marks</p> <ul style="list-style-type: none"> - Basic principles of electricity and Electrical measuring instruments, 5 Marks - Power sources and Electrical circuits and components, 5 Marks <p>Question 2 - Conductors and Cables, 50 Marks</p> <p><u>Term mark</u></p> <p>Practical, 150 marks, 75%</p> <p>Theoretical, 50 marks, 25%</p>		

Year 3Term 3

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1-8	Domestic Installations Date:	Revision: Do revision on the following: <ul style="list-style-type: none"> • Light circuits • Plug circuits Practical wiring of the following sub-circuits Geyser sub circuit: <ul style="list-style-type: none"> • 4 mm² cable used • Thermostat • Element and element replacement • Switch disconnect • Bonding • Earthing Stove sub circuit: <ul style="list-style-type: none"> • 4 mm² cable used • Switch disconnect • Single and three phase connection • Earthing • Fuses 	Theoretical explanation as well as practical demonstrations Activities: Example: Dismantling and assembling of a geyser Connection of a geyser sub circuit Dismantling And assembling of a stove Connection of a stove sub circuit Connecting, testing and fixing of a fluorescent light Continuity testing Insulation testing Connecting, testing and fixing home appliances : Kettle, Iron, electric stove, geyser, heater and fan Resources: Panel board for geyser sub circuit connection Panel board for stove sub circuit connection Fluorescent lighting equipment Multimeter Megger meter

		The stove: <ul style="list-style-type: none"> • Oven thermostat • Multiheat Continuity testing Insulation testing Fault finding of home appliances: Kettle, Iron, electric stove, geyser, heater and fan <ul style="list-style-type: none"> • Dismantling and assembling 	Home appliances
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9-10	Formal Assessment Date: <hr/>	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory with a 25% weighting
<p><u>Activity 1:</u> - Practical task 50 Marks = 25% of term mark</p> <p>Test geyser an stove sub circuits</p> <p><u>Activity 2:</u> - PAT (Practical project) 50 Marks = 20% of term mark</p> <p>Build a three heat stove switch (Assessment is done according to a rubric which includes all the skills acquired during the term.)</p> <p><u>Activity 3:</u> - PAT (Practical project) 50 Marks = 30% of term mark</p> <p>Build a five heat stove switch (Assessment is done according to a rubric which includes all the skills acquired during the term.)</p> <p><u>Activity 4:</u> - Formal written or oral assessment 50 Marks – 25%</p> <p>Scope of work is all the work done during the term</p> <p>Year 3, Term 3 Test</p> <p>Question 1 - Domestic installation, 50 Marks</p> <p><u>Term mark</u></p> <p>Practical, 150 marks, 75%</p> <p>Theoretical, 50 marks, 25%</p>		

Year 3Term 4

WEEK	TOPIC	CONTENT The learner able is to:	Techniques, activities, resources and process notes
1-6	Electrical motors and Transformers Date: <hr/>	Revision: Practical Do revision on the following: <ul style="list-style-type: none"> • Introduction to electrical motors <ul style="list-style-type: none"> • Purpose • Identification • Application • Testing Switching and control: <ul style="list-style-type: none"> • Direct on line single phase: <ul style="list-style-type: none"> • Overload protection • No Volt coil • Start button • Stop button • Variations <ul style="list-style-type: none"> • DOL with a light • DOL with a Capacitor start motor 	Theoretical explanation as well as practical demonstrations Activities: Example: Identify the motors and components Dismantle and assemble the motors Installation of a gate motor Installation pump Testing of all of the motors Resources: Universal motor Capacitor start motor Capacitor start and run motor Pump Multimeter Megger

7	Revision Date: <hr/>	Revision: Do revision of the following topics: <ul style="list-style-type: none">• Domestic installations• Electrical motors and transformers	
8-10	Formal Assessment Date: <hr/>	The weeks allocated for formal assessment are integrated across the weeks for teaching and learning. The assessments will consist of Practical Task/s with a 75% weighting and a theory test with a 25% weighting	

Activity 1: - PAT (Practical project) 150 Marks = 75% of term mark

Test a single phase electrical motor and then do a direct on line connection. (Assessment is done according to a rubric which includes all the skills acquired during the term. Marks must be converted to be 75% of term mark.)

Activity 2: - Formal written or oral assessment **65 Marks Converted to 50** – 25%

Scope of work is all the work done during term 3 and term

Year 3, Term 4 Examination

Question 1 -Term 3 Work: - Domestic installation, 15 Marks

Question 2 - Electrical Motors and Transformers 50 Marks

Term mark

Practical, 150 marks, 75%

Theoretical, 50 marks, 25%

Year 4 Term 1

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1	Health and safety (OHS Act) Date:	Revision Housekeeping: <ul style="list-style-type: none"> What is housekeeping? Housekeeping principles Advantages of good housekeeping Disadvantages of poor housekeeping Emergencies: <ul style="list-style-type: none"> What is an emergency? Identify types of emergencies Evacuation or reaction plans to the different types of emergencies Fire: <ul style="list-style-type: none"> Classes of fire Fire prevention Identify the types of extinguisher for the different classes of fire How to extinguish a fire 	Theoretical explanation as well as practical demonstrations Activities: Example: Explain what an emergency is, identify the types of emergencies and practice evacuation procedures for different emergencies Explain methods that can be used for fire prevention. Identify different classes of fire and different types of extinguishers for the different types of fires Practice extinguishing fires Explain housekeeping and housekeeping principles List the advantages of good housekeeping and the disadvantages of poor housekeeping Resources: Fire prevention equipment

2	First aid Date: <hr/>	Revision: Do revision on the following: <ul style="list-style-type: none"> • Basic First Aid <ul style="list-style-type: none"> • What to do when someone has been burnt • What to do when someone has been cut • Steps taken when someone is bleeding Wound assessment and treatment: <ul style="list-style-type: none"> • Assess the severity of a wound • Describe and demonstrate the appropriate treatment of the wound Completion of first aid records: <ul style="list-style-type: none"> • Introduction to first aid records • Filling in of accident report form Revision on respiratory and circulatory systems: <ul style="list-style-type: none"> • Introduction to CPR • Application of CPR 	Theoretical explanation as well as practical demonstrations Activities: Example: Assessing different types of wounds Demonstrate treatment of wounds Filling in first aid records Applying basic CPR Resources: First aid kit Wound substitutes First aid records CPR kit
3	Tools Date: <hr/>	Revision: Do revision of the following: <ul style="list-style-type: none"> • Power tools 	Theoretical explanation as well as practical demonstrations Activities: Example:

		<ul style="list-style-type: none"> Identify the function and Safe use of the following power tools: <ul style="list-style-type: none"> Angle grinder Bench grinder Hand drill Drill press Identify the function and installation of the following blades: <ul style="list-style-type: none"> Cutting disk <ul style="list-style-type: none"> Concrete Steel Grinding disk Flap disk Identify function and installation of drill bits: <ul style="list-style-type: none"> Concrete Steel Wood 	<p>Demonstrate the proper safe use for the tools</p> <p>Use the grinders to cut material and walls for chasing</p> <p>Use the drills to drill holes into material</p> <p>Resources:</p> <p>Power tools</p> <p>Material to cut</p>
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4	Basic principles of electricity and electrical measuring instruments Date: <hr/>	Revision: Do revision on the following: <ul style="list-style-type: none"> • Atomic theory: <ul style="list-style-type: none"> • Introduction to Ohms Law • Simple calculations: ($R=V/I$, $I=V/R$, $V=IxR$) • Resistors in series Atomic theory: <ul style="list-style-type: none"> • Resistors in parallel • Building simple circuits to prove Ohms Law Revision: Do revision on the following <ul style="list-style-type: none"> • Electrical measuring instruments: <ul style="list-style-type: none"> • Introduction of the insulation(megger)meter • Application and safe use of the meggar meter Electrical measuring instruments: <ul style="list-style-type: none"> • Measuring power in AC single phase and DC 	Theoretical explanation as well as practical demonstrations Activities: Example: Ohms Law calculations Building circuits Measurement of current, voltage and resistance using a multimeter to prove Ohms Law Resources: Components for building circuits Multimeter Meggar
5-6	Power sources Date: <hr/>	Revision: Practical Do revision on the following: <ul style="list-style-type: none"> • Basic battery charger: 	Theoretical explanation as well as practical demonstrations Activities: Example: Identifying the circuit of a basic battery charger

		<ul style="list-style-type: none"> Identify the circuit of a basic battery charger Identify the components of a basic battery charger Dismantle and assemble a basic battery charger <p>Regulated power supply:</p> <ul style="list-style-type: none"> Identify the circuit of a regulated power supply Identify the components of a regulated power supply Dismantle and assemble a regulated power supply Build a regulated power supply 	<p>Identifying and listing of a basic battery charger</p> <p>Dismantle and assemble a basic battery charger</p> <p>Identifying the circuit of a regulated power supply</p> <p>Identifying and listing parts of a regulated power supply</p> <p>Dismantle and assemble a regulated power supply</p> <p>Build a regulated power supply</p> <p>Resources:</p> <p>Circuit of a battery charger</p> <p>Model of a battery charger</p> <p>Circuit of a regulated power supply</p> <p>Model of a regulated power supply</p>
7-8	<p>Electrical circuits and components</p> <p>Date:</p> <hr/>	<p>Revision:</p> <p>Do revision on the following:</p> <ul style="list-style-type: none"> Identify the Components, symbols, units and function of: <ul style="list-style-type: none"> Resistor Thermistor Incandescent Light Fuse Coil Variable resistor Capacitor 	<p>Theoretical explanation as well as practical demonstrations</p> <p>Activities:</p> <p>Example:</p> <p>Identify components, symbols, units and functions</p> <p>Testing and measuring of components</p> <p>Identifying values of components</p> <p>Building circuits</p> <p>Resources</p>

		<ul style="list-style-type: none"> • Diode • LED • Thermistor <ul style="list-style-type: none"> • Diode and LED in the forward bias mode • Diode and LED reverse bias mode <p>Practical</p> <ul style="list-style-type: none"> • Test the components and measure with a multimeter. • Identify the value of the component • Build a series circuits consisting of two resistors • Build a parallel circuits consisting of two resistors <p>Identify the Components, symbols, units and function of the <u>LDR</u></p> <p>Test the components and measure with a multimeter</p> <p>Identify the value of the component</p> <p>Build a simple circuit containing the components</p> <p>Build the diode and LED in forward and reverse bias mode</p>	<p>Different components</p> <p>Measuring instruments</p> <p>Notes:</p> <p>Build the diode and LED in forward and reverse bias mode</p>
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9-10	Formal Assessment Date: <hr/>	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory with a 25% weighting
<p>Activity 1: - PAT (Practical project) 150 Marks = 75% of term mark (A new PAT must be started in term 3 and can be carried over to term 4)</p> <p>Build a regulated power supply (Assessment is done according to a rubric which includes all the skills acquired during the term. Marks must be converted to be 75% of total term mark)</p> <p>Activity 2: - Formal written or oral assessment 50 Marks – 25%</p> <p>Scope of work is all the work done during the term.</p> <p>Year 4, Term 1 Test</p> <p>Question 1 - Health and Safety, 5 Marks</p> <p>Question 2 - First Aid, 5 Marks</p> <p>Question 3 - Tools, 5 Marks</p> <p>Question 4 - Basic principles of Electricity & Electrical Measuring instruments, 5 Marks</p> <p>Question 5 - Power Sources, 15 Marks</p> <p>Question 6 - Electrical circuits and Components, 15 Marks</p> <p>Term mark</p> <p>Practical, 150 marks, 75%</p> <p>Theoretical, 50 marks, 25%</p>		

Year 4 Term 2

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1-7	<p>Conductors and cables.</p> <p>Date:</p> <hr/>	<p>Conductor joining and reticulation methods:</p> <p>Use of crimping tools:</p> <ul style="list-style-type: none"> Identify different types of crimping tools Identify different types of crimped terminals Demonstrate use of crimping tool <p>Reticulation methods</p> <ul style="list-style-type: none"> Identify types of reticulation methods Underground and overhead <p>Jointing method:</p> <ul style="list-style-type: none"> Non-Soldered joints Low voltage waterproof cable joints Armoured cable joint <p>Insulation:</p> <ul style="list-style-type: none"> Identify the types of insulation Advantages and disadvantages of the different types of insulation <p>Types of conductors:</p> <ul style="list-style-type: none"> Industrial cables 	<p>Theoretical explanation as well as practical demonstrations</p> <p>Activities:</p> <p>Examples:</p> <p>Identify types of crimping tools</p> <p>Identify types of crimped terminals</p> <p>Use of crimping tools</p> <p>Identify reticulation methods</p> <p>Demonstrate reticulation methods</p> <p>Joining cables :</p> <ul style="list-style-type: none"> Non-Soldered Low voltage water proof Armoured cable <p>Identify types of insulation</p> <p>Demonstrate advantages and disadvantages of the different types of insulation</p> <p>Identify industrial and armoured cables</p>

		<ul style="list-style-type: none"> Armoured cables Cable installation: <ul style="list-style-type: none"> Glands (armoured) Connection boxes (industrial) Buried cables Cable ways Overhead cables (air) <p>Practical</p> <ul style="list-style-type: none"> Underground reticulation Overhead reticulation 	<p>Demonstrate cable installations</p> <p>Resources:</p> <p>Different types of cables</p> <p>Different types of insulation</p> <p>Tools needed for installation of cables including cutting and chasing.</p> <p>Cable installation material</p>
8	<p>Revision</p> <p>Date:</p> <hr/>	<p>Revision:</p> <p>Do revision of the following topics:</p> <ul style="list-style-type: none"> Health and safety First Aid Tools and instruments Basic principles of electricity Electrical measuring instruments Power sources Electrical circuits and components <p>Conductors and cables</p>	<p>Theoretical explanation and practical demonstration</p> <p>Activities:</p> <p>Example:</p> <p>Answering worksheets</p> <p>Practical demonstrations</p> <p>Building circuits</p>

9-10	Formal Assessment Date:	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory test with a 25% weighting
<p>Activity 1: - Practical task 50 Marks = 25% of term mark Do a full armoured cable test</p> <p>Activity 2: - Practical task 50 Marks = 25% of term mark This project must be finished by the end of term 2 Complete an armoured cable joint (Assessment is done according to a rubric which includes all the skills acquired during the term)</p> <p>Activity 3: - Practical task 50 Marks = 25% of term mark Install an armoured cable into a distribution board using the correct techniques</p> <p>Activity 4: - Formal written or oral assessment 65 Marks Converted to 50 – 25% Scope of work is all the work done during term 1 and term 2.</p> <p>Year4, Term 2 Examination</p> <p>Question 1 - Term 1 Work: - Health and Safety, First Aid and Tools, 5 Marks</p> <ul style="list-style-type: none"> - Basic principles of electricity and electrical measuring instruments, 5 Marks - Power sources and Electrical circuits and components, 5 Marks <p>Question 2 - Conductors and Cables, 50 Marks</p> <p>Term mark</p> <p>Practical, 150 marks, 75%</p> <p>Theoretical, 50 marks, 25%</p>		

Year 4 Term 3

WEEK	TOPIC	CONTENT	Techniques, activities, resources and process notes
		The learner is able to:	
1-8	Domestic installation Date: <hr/>	Connection to the supplier: <ul style="list-style-type: none"> • Main switch • Energy meter • Distribution board wiring Domestic installation components: <ul style="list-style-type: none"> • Earth leakage • Surge arrestor • Pilot light • Cable <ul style="list-style-type: none"> • Sizes • Types • MCB • Buss Bars • Earth and neutral bars Complete Domestic installation <ul style="list-style-type: none"> • Complete a Domestic installation Day night switch: <ul style="list-style-type: none"> • Identify the purpose 	Theoretical explanation as well as practical demonstrations Activities: Example: Connecting a main switch to the supplier Connecting an energy meter to the distribution board Wiring a distribution board Installing domestic installation components Identifying a day night switch Testing and connecting a day night switch Identifying types of fluorescent lights Testing and installing fluorescent lights Resources: Distribution board components Day night switch Fluorescent lights Multimeter

		<ul style="list-style-type: none"> • Identify the components • Testing • Connect a day night switch in a domestic installation <p>Fluorescent lights</p> <ul style="list-style-type: none"> • Connecting • Testing • Changing the lightbulb • Changing the starter • Testing and changing the ballast <p>Practical</p> <p>Wiring of :</p> <ul style="list-style-type: none"> • distribution board • light circuits • switch plugs • Stove • Geyser • Complete domestic installation 	
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9-10	Formal Assessment Date: <hr/>	The weeks allocated for formal assessment are integrated across the weeks planned for teaching and learning. The assessment will consist of Practical Task/s with a 75% weighting and a Theory with a 25% weighting
<p><u>Activity 1:</u> - PAT (Practical project) 75 Marks = 35% of term mark</p> <p>Complete a three phase direct on line motor connection</p> <p><u>Activity 2:</u> - PAT (Practical project) 75 Marks = 40% of term mark (A new PAT must be started in term 3)</p> <p>Complete a full domestic installation. (Assessment is done according to a rubric which includes all the skills acquired during the term)</p> <p><u>Activity 3:</u> - Formal written or oral assessment 50 Marks – 25%</p> <p>Scope of work is all the work done during the term</p> <p>Year 4, Term 3 Test</p> <p>Question 1 - Domestic installation, 50 Marks</p> <p><u>Term mark</u></p> <p>Practical, 150 marks, 75%</p> <p>Theoretical, 50 marks, 25%</p>		

Year 4 Term 4

WEEK	TOPIC	CONTENT	Techniques, activities, resources and process notes
1	Electrical motors and transformers Date: _____	Introduction to three phase transformers: <ul style="list-style-type: none"> • Purpose • Transformer configuration (Star/Delta), diagrams • Transformer testing 	Testing of transformers(Different configurations) Drawing and explaining of different configuration diagrams
2	Revision Date: _____	Revision and consolidation Do revision on the following topics: <ul style="list-style-type: none"> • Health and safety (OHS Act) • First Aid Tools and instruments Do revision on the following topics: <ul style="list-style-type: none"> • Basic principles of electricity • Electrical Measuring instruments • Power sources 	Theoretical explanation as well as practical demonstrations Activities: Example: Explain what an emergency is, identify the types of emergencies and practice evacuation procedures for different emergencies Explain methods that can be used for fire prevention Identify different classes of fire and different types of extinguishers for the different types of fires Practice extinguishing fires Explain housekeeping and housekeeping principles.

			<p>List the advantages of good housekeeping and the disadvantages of poor housekeeping</p> <p>Resources:</p> <p>Fire prevention equipment</p> <p>Activities:</p> <p>Example:</p> <p>Ohms Law calculations</p> <p>Building circuits</p> <p>Measurement of current, voltage and resistance using a multimeter to prove Ohms Law</p> <p>Resources:</p> <p>Components for building circuits</p> <p>Multimeter</p> <p>Megger</p>
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3	<p>Revision</p> <p>Date:</p> <hr/>	<p>Revision and consolidation</p> <p>Do revision on the following topics:</p> <ul style="list-style-type: none"> • Electrical circuits and components • Conductors and cables 	<p>Theoretical explanation as well as practical demonstrations</p> <p>Activities:</p> <p>Examples:</p> <p>Identify types of crimping tools</p> <p>Identify types of crimped terminals</p> <p>Use of crimping tools</p> <p>Identify reticulation methods</p> <p>Demonstrate reticulation methods</p> <p>Joining cables :</p> <ul style="list-style-type: none"> • Non-Soldered • Low voltage water proof • Armoured cable <p>Identify types of insulation</p> <p>Demonstrate advantages and disadvantages of the different types of insulation</p> <p>Identify industrial and armoured cables</p> <p>Demonstrate cable installations</p> <p>Resources:</p>
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			<p>Different types of cables</p> <p>Different types of insulation</p> <p>Tools needed for installation of cables including cutting and chasing.</p> <p>Cable installation material</p>
4	<p>Revision</p> <p>Date:</p> <hr/>	<p>Revision and consolidation</p> <p>Do revision on the following topics:</p> <ul style="list-style-type: none"> • Domestic installations • Electrical motors and transformers 	<p>Theoretical explanation as well as practical demonstrations</p> <p>Activities:</p> <p>Example:</p> <p>Connecting a main switch to the supplier</p> <p>Connecting an energy meter to the distribution board</p> <p>Wiring a distribution board</p> <p>Installing domestic installation components</p> <p>Identifying a day night switch</p> <p>Testing and connecting a day night switch</p> <p>Identifying types of fluorescent lights</p> <p>Testing and installing fluorescent lights</p> <p>Resources:</p>

			Distribution board components Day night switch Fluorescent lights Multimeter
5-10	External examination Date:	External moderation of school assessment over terms 1, 2 and 3. <u>600 Marks converted to 100</u> = 50% of qualification Complete external Practical Assessment Task (PAT) 50 Marks = 25% of qualification Formal external assessment written test or oral <u>100 Marks converted to 50</u> = 25% of qualification Year 4, Term 4 Examination Question 1 - Health and Safety, First Aid and Tools and Instruments, 10 Marks Question 2 - Power sources, 10 Marks Question 3 - Electrical Circuits and Components, 10 Marks Question 4 - Conductors and Cables, 35 Marks Question 5 - Domestic installations, 30 Marks Question 6 - Electrical Motors and Transformers, 5 Marks <u>Term mark</u> Practical, 150 marks, 75% Theoretical, 50 marks, 25%	

SECTION 4

ASSESSMENT

4.1 Introduction

This section on assessment *standardises* the recording and reporting processes for the Technical Occupational Curriculum and Assessment Policy Statement that is offered in schools that offer this learning programme. It also provides a policy framework for the management of school based assessment and school assessment records.

It is critically required of teachers to offer all measures of differentiated assessment as outlined in Chapter 9 of the National Protocol for Assessment. Especially learners in special schools who follow the Technical Occupational Curriculum over a period of four years have diverse learning styles and support needs. Since a learner or learners may be functioning on different levels, the assessment / recording / reporting system must make provision to reflect the level(s) of each learner. Each learner, regardless of his/her number of years in the school, must have access to the standard of assessment best suited to his/her needs. The learner's *abilities* determine what will be expected of him/her and the *pacing* of instruction must accommodate each individual learner within a framework of high expectations (See Chapter 9 of the National Protocol for Assessment).

Learners are also eligible for Accommodations and Concessions as outlined in the Standard Operating Procedures for the Assessment of Learners who Experience Barriers to Assessment from Grade R to 12 (2017).

All decisions related to differentiated assessment are made through completing the protocols as outlined in the Policy on Screening, Identification, Assessment and Support (2014) and recorded and tracked through the Individual Support Plans of learners.

4.2 Assessment Principles

4.2.1 Definition

Assessment is a continuous planned process of identifying, gathering and interpreting information about the performance of learners, using various forms of assessment. It involves four steps: generating and collecting evidence of achievement; evaluating this evidence; recording the findings and using this information to understand and thereby assist the learner's development in order to improve the process of learning and teaching. Assessment should be both informal (Assessment

for Learning) and formal (Assessment of Learning). In both cases regular feedback should be provided to learners to enhance the learning experience.

Assessment is a process that measures individual learners' attainment of knowledge (content and concepts) and skills by collecting, analysing and interpreting the data and information obtained from this process to:

- Enable the teacher to judge a learner's progress in a reliable way;
- Inform learners of their strengths, weaknesses and progress; and
- Assist teachers, parents and other stakeholders in making decisions about the learning process and the progress of learners.

Assessment should be mapped against the content, skills, intended aims and topics specified in the learning programme. In both informal and formal assessments, it is important to ensure that in the course of a school year:

- All of the topics and content are covered;
- The full range of skills is included; and
- A variety of different forms of assessment are used.

4.2.2 Informal Assessment or Daily Assessment

Assessment for learning has the purpose of continuously collecting information on a learner's achievement that can be used to improve their learning. Informal assessment is a daily monitoring of learners' progress. This is done through observations, discussions, practical demonstrations, learner-teacher conferences, informal classroom interactions, etc. Informal assessment may be as simple as stopping during the lesson to observe learners or to discuss with learners how learning is progressing. Informal assessment should be used to provide feedback to the learners and to inform planning for teaching, but need not be recorded. It should not be seen as separate from learning activities taking place in the classroom. Learners or teachers can assess their performance in the tasks. Self-assessment and peer assessment actively involves learners in assessment. This is important as it allows learners to learn from and reflect on their own performance. The results of the informal daily assessment tasks are not formally recorded unless the teacher wishes to do so. **The results of daily, informal assessment tasks are not taken into account for progression, promotion and certification purposes.**

Informal, on-going assessments should be used to scaffold the acquisition of knowledge and skills and should be the stepping stones leading up to the formal tasks in the Programmes of Assessment.

4.2.3 Formal Assessment

All assessment tasks that make up a formal programme of assessment for the year are regarded as Formal Assessment. Formal Assessment Tasks are marked and formally recorded by the teacher for progression and certification purposes. All Formal Assessment Tasks are subject to moderation for the purpose of quality assurance and to ensure that appropriate standards are maintained. Formal assessment tasks form part of a year-long formal Programme of Assessment.

a. Why use a Formal Assessment task?

“Formal Assessment Task (assessment of learning)” – is a systematic way of assessment used by teachers to determine how well learners are progressing in a level and in a particular subject.

b. What is a Formal Assessment Task?

It is a set of questions and or instructions that learners need to respond to. A task may consist of a range of activities. A formal task must be valid, fair and reliable and must cover sufficient knowledge and or skills to report on the learners' progress.

Teachers must ensure that assessment criteria are very clear to the learners before the assessment process commences. This involves explaining to the learners which knowledge and skills are being assessed and the required length of responses. Feedback should be provided to the learners after assessment and could take the form of whole-class discussion or teacher-learner interaction. Examples of formal assessments include projects, oral presentations, simulations, performances, tests, examinations, practical demonstrations, etc. The **forms of assessment** used should be appropriate to the age and the developmental level of the learners as well as the context of the subject or skills being assessed. The assessment tasks should be carefully designed to cover the topic, content and or skills of the subject. The design of these tasks should therefore ensure that a variety of skills are assessed.

Practical Assessment Tasks allow for learners to be assessed on a regular basis during the school year and also allow for the assessment of skills that cannot be assessed in a written format, e.g. test or examination.

Assessment in the General Certificate of Education: Technical Occupational (GCE: TO)

Assessment in the GCE: TO is underpinned by the objectives of the National Qualifications Framework (NQF). These objectives are to:

- Create an integrated national framework for learning achievements.
- Facilitate access to and progression within education, training and career paths.
- Enhance the quality of education and training.
- Redress unfair discrimination and past imbalances and thereby accelerate employment opportunities.
- Contribute to the holistic development of the learner by addressing:
 - Social adjustment and responsibility;
 - Moral accountability and ethical work orientation;
 - Economic participation; and
 - Nation-building.

The principles that drive these objectives are:

- ***Integration***

To adopt a unified approach to education and training that will strengthen the human resources development capacity of the nation.

- ***Relevance***

To be dynamic and responsive to national development needs.

- ***Credibility***

To demonstrate national and international values and acquired competencies and skills so as to ensure the recognition of the qualification to be attained.

- ***Coherence***

To work within a consistent framework of principles and certification.

- ***Flexibility***

To allow for creativity and resourcefulness when achieving skills to cater for different learning styles and use a range of assessment methods, instruments and techniques.

- ***Participation***

To enable stakeholders to participate in setting standards and co-ordinating the achievement of the qualification.

- **Access**

To address barriers to learning at each level to facilitate learners' progress.

- **Progression**

To ensure that the qualification framework permits individuals to move through the levels of the national qualification via different, appropriate combinations of the components of the delivery system.

- **Portability**

To enable learners to transfer parts of a qualification from one learning institution and/or employer to another institution or employer.

- **Articulation**

To allow for vertical and horizontal mobility in the education system when pre-requisites for accreditation have been successfully completed.

- **Recognition of Prior Learning**

To grant credits for a unit of learning following an assessment or if a learner possesses the capabilities specified in each skills area.

- **Validity of assessments**

To ensure assessment covers a broad range of knowledge, skills, values and attitudes (SKVAs) needed to demonstrate applied competency. This is achieved through:

- Clearly stating the skill to be assessed;
- Selecting the appropriate or suitable evidence;
- Matching the evidence with a compatible or appropriate method of assessment; and
- Selecting and constructing an instrument(s) of assessment.

- **Reliability**

To assure assessment practices are consistent so that the same result or judgment is arrived at if the assessment is replicated in the same context. This demands consistency in the interpretation of evidence; therefore, careful monitoring of assessment is vital.

- **Fairness and transparency**

To verify that no assessment process or method(s) hinders or unfairly advantages any learner. The following could constitute unfairness in assessment:

- Inequality of opportunities, resources or teaching and learning approaches;
- Bias based on ethnicity, race, gender, age, disability or social class;
- Lack of clarity regarding topic, content or skill being assessed; and
- Comparison of learner's work with that of other learners, based on learning styles and language.

- ***Practicability and cost-effectiveness***

To integrate assessment practices within the teaching and learning process and strive for cost and time-effective assessment.

4.3 Managing Assessment

Assessor Requirements

Assessors must be subject specialists with adequate formal assessment experience. If the teacher conducting the assessments has not been declared a competent assessor, an assessor who has been declared competent may be appointed to oversee the assessment process to ensure the quality and integrity of assessments for the qualification.

Types of Assessment

Assessment benefits the learner and the teacher. It informs learners about their progress and helps teachers make informed decisions at different stages of the learning process. Depending on the intended purpose, different types of assessment can be used.

- **Baseline assessment:** At the beginning of a level or learning experience, baseline assessment establishes the knowledge, skills, values and attitudes (SKVAs) that learners bring to the classroom. This knowledge assists teachers to plan learning programmes and learning activities.
- **Diagnostic assessment:** This assessment diagnoses the nature and causes of barriers to learning experienced by specific learners. It is followed by guidance, appropriate support and intervention strategies. This type of assessment is useful to make referrals for learners requiring specialist help.

- **Formative assessment (Informal Assessment):** This assessment monitors and supports teaching and learning. It determines learners' strengths and weaknesses and provides feedback on progress. It determines if a learner is ready for summative assessment.
- **Summative assessment (Formal Assessment)** This type of assessment gives an overall picture of student progress at a given time. It determines whether the student is sufficiently competent to progress to the next level.

Planning Assessment

An assessment plan should cover three main processes:

- **Collecting evidence:** The assessment plan indicates which learning programme topics, content and skills will be assessed, what assessment method or activity will be used and when this assessment will be conducted.
- **Recording:** The process of recording refers to the assessment instruments or tools with which the assessment will be captured or recorded. Therefore, appropriate assessment instruments must be developed or adapted.
- **Reporting:** All the evidence is put together in a report to deliver a decision for the subject.

Methods of Assessment

Methods of assessment refer to who carries out the assessment and includes teacher assessment, self-assessment, peer assessment and group assessment.

TEACHER ASSESSMENT	The Teacher assesses learners' performance against given criteria in different contexts, such as individual work, group work, etc.
SELF-ASSESSMENT	Learners assess their own performance against given criteria in different contexts, such as individual work, group work, etc.
PEER ASSESSMENT	Learners assess another student or group of learners' performance against given criteria in different contexts,

	such as individual work, group work, etc.
GROUP ASSESSMENT	Learners assess the individual performance of other learners within a group or the overall performance of a group of learners against given criteria.

Task lists and **checklists** show the learners what needs to be done. They consist of short statements describing the expected performance in a particular task. The statements on the checklist can be ticked off when the learner has adequately achieved the criterion. Checklists and task lists are useful in peer or group assessment activities.

Rubrics are a hierarchy (graded levels) of criteria with benchmarks that describe the minimum level of acceptable performance or achievement for each criterion. It is a different way of assessment and cannot be compared to tests. Each criterion described in the rubric must be assessed separately. Mainly, two types of rubrics, namely holistic and analytical, are used.

Competence Descriptions

All assessment should award marks to evaluate specific assessment tasks. However, marks should be awarded against rubrics and not simply be a total of ticks for right answers. Rubrics should explain the competence level descriptors for the skills, knowledge, values and attitudes (SKVAs) a learner must demonstrate to achieve each level of the rating scale. When teachers or assessors prepare an assessment task or question, they must ensure that the task or question addresses an aspect of a topic or skill. The relevant content must be used to create the rubric to assess the task or question. The descriptions must clearly indicate the minimum level of attainment for each category on the rating scale.

Strategies for Collecting Evidence

A number of different assessment instruments may be used to collect and record evidence. Examples of instruments that can be (adapted and) used in the classroom include:

Record sheets: The teacher observes learners working in a group. These observations are recorded in a summary table at the end of each task. The teacher can design a record sheet to observe learners' interactive and problem-solving skills, attitudes towards group work and involvement in a group activity.

Checklists: Checklists should have clear categories to ensure that the objectives are effectively met. The categories should describe how the activities are evaluated and against what criteria they are evaluated. Space for comments is essential.

School Assessment Programme

The **Programme of Assessment** is designed to spread formal assessment tasks in all subjects in a school across a term.

The programme of assessment should be recorded in the Teacher's planning file (Portfolio of Assessment) for each subject.

The following should at least be included in the Teacher's File:

- A contents page;
- The formal schedule of assessment;
- The requirements for each assessment task;
- The tools used for each assessment task;
- Recording instrument(s) for each assessment task; and
- A mark sheet and report for each assessment task.

The learner's Evidence of Performance must at least include:

- A contents page;
- The assessment tasks according to the assessment programme as indicated below;
- The assessment tools or instruments for the task; and
- A record of the marks (and comments) achieved for each task.

Where tasks cannot be contained as evidence in the Portfolio of Evidence (PoE), its exact location must be recorded and it must be readily available for moderation purposes.

Assessment across the four years

Year 1 Reporting only in the term when the skill is done.

The GCE: Technical Occupational Qualification at NQF Level 1 is a four year Learning Programme. In year one a learner is exposed to a number of Occupational Subjects. Each subject is offered over a ten week period (one term) in Year 1, where the learner is exposed to the basic skills required for the subject. By the end of year 1 the learner will select a minimum of one skill for the qualification.

Year 1	Formal School-Based Assessments
	Learner performance in the Term:
	Practical 75% *
	Theory 25%
Term Report	100%

Years 2 and 3

Year 2 will focus on a broad overview of the subject with a basic understanding and mastery of some of the basic skills required in the subject. Year 3 will focus on the consolidation of the basic skills and the addition of more advanced skills. Learners must in Year 3 start to develop a greater degree of independent mastery of the subject skills

Year 2/3	Formal School-Based Assessments			Final End-of-Year Assessments
	Term 1	Term 2	Term 3	Term 4
	Practical 75% *	Practical 75% *	Practical 75% *	○ Practical 75%
	Theory 25%	Theory 25%	Theory 25%	
				○ Pen and Paper Test/ Exam 25%
Term Report	100%	100%	100%	
End of Year	SBA 75%			25%

Year 4 Qualification year

In year 4 the focus shifts to the World of Work. Learners must consolidate required skills for the qualification and may engage in workplace exposure for a short period of time during the fourth year. Learners develop independent mastery of skills to be competent within the workplace

Year 4	Formal School-Based Assessments			Final End-of-Year Assessments
	Term 1	Term 2	Term 3	Term 4
	Practical 75% *	Practical 75% *	Practical 75% *	External Practical Assessment Task 25%
	Theory 25%	Theory 25%	Theory 25%	
				Pen and Paper Test 25%
Term Report	100%	100%	100%	
End of Year	SBA 50%			External Exam 50%

CLARIFICATION ON ASSESSMENT PERIODS

Year 1:

Term theory assessment to consist of all work done in the term

Year 2 and 3:

Term 1 theory assessment to consist of work done in term 1 only

Term 2 theory assessment to consist of work done in terms 1 and 2

Term 3 theory assessment to consist of work done in term 3 only

Term 4 theory assessment to consist of work done in terms 3 and 4

Year 4:

Term 1 theory assessment to consist of work done in term 1 only

Term 2 theory assessment to consist of work done in terms 1 and 2

Term 3 theory assessment to consist of work done in terms 1, 2 and 3

Term 4 Theory completed in the year

Timing of formal assessment

Suggested Program of Assessment for Electrical Technology

YEAR 1					
Term	Content/ concept/skill	Activities	Forms of Assessment	%	FATs based on activities in CAPS: TO
Year 1	<ul style="list-style-type: none"> Health and safety First aid Tools and instruments Electrical measuring instruments Conductors and cables Domestic installations Electrical motors and transformers 	Activity 1 Respond to practical task	PAT 100 Marks	50%	FAT 1
		Activity 2 Complete practical work	Practical 50 Marks	25%	
		Activity 3 Respond to questions	Pen and paper test (Oral or written test) 50 Marks	25%	

YEAR 2					
Term	Content/ concept/skill	Activities	Forms of Assessment	%	FATs based on activities in CAPS: TO
Term 1	<ul style="list-style-type: none"> Health and safety First Aid Tools and instruments 	Activity 1 Complete practical work	Demonstration 50 Marks	15%	FAT 1
		Activity 2 Respond to practical task	PAT 50 Marks	20%	
		Activity 3 Respond to practical task	PAT 50 Marks	40%	
		Activity 4 Respond to questions	Pen and paper test (Oral or written test) 50 Marks	25%	
Term 2	<ul style="list-style-type: none"> Basic principles of electricity Electrical measuring instruments Power sources Electrical circuits and components 	Activity 1 Demonstration	Demonstration 50 Marks	25%	FAT 2
		Activity 2 Respond to practical task	PAT 50 Marks	25%	
		Activity 3 Respond to practical task	PAT 50 Marks	25%	
		Activity 4 Respond to questions	Pen and paper test (Oral or written test) 65 Marks (converted to 50)	25%	
Term 3	<ul style="list-style-type: none"> Conductors and cables Domestic installations 	Activity 1 Respond to practical task	PAT 50 Marks	25%	FAT 3
		Activity 2 Respond to practical task	PAT 50 Marks	20%	

		Activity 3 Respond to practical task	PAT 50 Marks	30%	
		Activity 4 Respond to questions	Pen and paper test (Oral or written test) 50 Marks	25%	
Term 4	<ul style="list-style-type: none"> Electrical motors and transformers 	Activity 1 Respond to practical task	PAT 50 Marks	25%	FAT 4
		Activity 2 Respond to practical task	PAT 100 Marks	50%	
		Activity 4 Respond to questions	Pen and paper test (Oral or written test) 65 Marks (converted to 50)	25%	

YEAR 3					
Term	Content/ concept/skill	Activities	Forms of Assessment	%	FATs based on activities in CAPS: TO
Term 1	<ul style="list-style-type: none"> Health and safety First Aid Tools and instruments Basic principles of electricity Electrical measuring instruments Power sources Electrical circuits and components 	Activity 1 Complete practical work	Practical 50 Marks	25%	FAT 1
		Activity 2 Respond to practical task	PAT 100 Marks	50%	
		Activity 3 Respond to questions	Pen and paper test (Oral or written) 50 Marks	25%	
Term 2	<ul style="list-style-type: none"> Conductors and cables 	Activity 1 Complete practical work	Practical 50 Marks	25%	FAT 2
		Activity 2 Respond to practical task	PAT 100 Marks	50%	
		Activity 3 Respond to questions	Pen and paper test (Oral or written) 65 Marks (Converted to 50)	25%	
Term 3	<ul style="list-style-type: none"> Domestic installations 	Activity 1 Complete practical work	Practical 50 Marks	25%	FAT 3
		Activity 2 Respond to practical task	PAT 50 Marks	20%	
		Activity 3 Respond to practical task	PAT 50 Marks	30%	

		Activity 4 Respond to questions	Pen and paper test (Oral or written) 50 Marks	25%	
Term 4	<ul style="list-style-type: none"> Electrical motors and transformers 	Activity 1 Respond to practical task	PAT 150 marks	75%	FAT 4
		Activity 2 Respond to questions	Pen and paper test (Oral or written) 65 Marks (Converted to 50)	25%	

YEAR 4					
Term	Content/ concept/skill	Activities	Forms of Assessment	%	FATs based on activities in CAPS: TO
Term 1	<ul style="list-style-type: none"> Health and safety First Aid Tools and instruments Basic principles of electricity Electrical measuring instruments Power sources Electrical circuits and components 	Activity 1 Respond to practical task	PAT 150 Marks	75%	FAT 2
		Activity 2 Respond to questions	Pen and paper test (Oral or written) 50 Marks	25%	
Term 2	<ul style="list-style-type: none"> Conductors and cables 	Activity 1 Complete practical work	Practical 50 Marks	25%	FAT 3
		Activity 2 Complete practical work	Practical 50 Marks	25%	
		Activity 3 Complete practical work	Practical 50 Marks	25%	
		Activity 4 Respond to questions	Pen and paper test (Oral or written) 65 Marks (Converted to 50)	25%	
Term 3	<ul style="list-style-type: none"> Domestic installations Electrical motors and transformers 	Activity 1 Respond to practical task	PAT 75 Marks	35%	FAT 4
		Activity 2 Respond to practical task	PAT 75 Marks	40%	
		Activity 3 Respond to	Pen and paper test (Oral or written)	25%	

		questions	50 Marks		
Term 4	<ul style="list-style-type: none"> Core content and Concept across the years 	External moderation of school based assessment over terms 1, 2 and 3.		50%	GCE: TO Qualification
		Activity 1 Practical	Formal external Practical Assessment Task 50 Marks	25%	
		Activity 2 Respond to questions	Formal external assessment: Written test (or oral where necessary) 100 Marks (Converted to 50)	25%	

Recording and Reporting

Recording is a process in which the teacher documents the level of a learner's performance in a specific assessment task. It indicates learner progress towards the achievement of the knowledge and skill. Records of learner performance should provide evidence of the learner's progression. Records of learner performance should also be used to verify the progress made by teachers and learners in the teaching and learning process. Reporting is a process of communicating learner performance to learners, parents, schools, and other stakeholders. Learner performance can be reported in a number of ways. These include report cards, parents' meetings, school visitation days, parent-teacher conferences, phone calls, letters, class or school newsletters, etc.

Good record keeping is essential in all assessment, particularly in continuous assessment. A record book or file must be kept up to date by each teacher. It should contain:

- Learners' names;
- Dates of assessment;
- Name and description of the assessment activity;
- The results of assessment activities, according to Subject; and
- Comments for support purposes.

Teachers report in percentages against the subject. The various achievement levels and their corresponding percentage bands are as shown in the table below. Recording is a process in which the teacher documents the level of a learner's performance. Teachers record the actual raw marks against the task using a record sheet. Records of learner performance should also be used to verify the progress made by teachers and learners in the teaching and learning process. Records should be used to monitor learning and to plan ahead.

Note: The seven-point scale should have clear descriptions that give detailed information for each level. Teachers will record actual marks against the task by using a record sheet; and report percentages against the subject on the learners' report cards.

Codes and percentages for reporting

Rating code	Description of competence	Percentage	Nature of support provided to learners
7	Outstanding achievement	80 – 100	Independent
6	Meritorious achievement	70 – 79	Independent, verbal cues needed
5	Substantial achievement	60 – 69	Minimum support
4	Adequate achievement	50 – 59	Moderate support
3	Moderate achievement	40 – 49	Maximum support (Physical / Verbal)
2	Elementary achievement	30 – 39	Goals to be revisited – Change of direction required.
1	Not achieved	0 – 29	Little / no interest shown in the activity despite maximum support

All records must be accessible, easy to interpret, securely kept, confidential and helpful in the teaching and reporting process. The school assessment policy determines the details of how record books must be completed. Schools are required to provide quarterly feedback to parents on the Programme of Assessment, using a formal reporting tool, such as a report card. The schedule and the report card should indicate the overall level of performance of a learner.

NOTE:

Criterion referencing is best used to describe learner's performance in a skill. Teachers must make use of suitable analytical rubrics when assessing a learner's competence for a specific skill using practical demonstrations.

Progression and Promotion:

Learners will progress with age cohort in this Phase (Year 1-4). Where a learner does not meet the minimum requirements to be promoted to the next year then a learner may spend one extra year in the phase (Year 1-4) to strengthen their ability to achieve the qualification.

4.4 Moderation of Assessment

Moderation refers to the process that ensures that the assessment tasks are fair, valid and reliable. Moderation must be implemented at school, district, and provincial levels as required. Comprehensive and appropriate moderation practices must be in place for the quality assurance of all subject assessments. The Formal School Based Assessment and the practical assessment tasks must be moderated by the relevant subject specialists at the district and, if required, provincial levels in consultation with the moderators at school.

Moderation serves five purposes:

1. It must ascertain whether subject content and skills have been sufficiently covered.
2. The moderator must ensure that the correct balance of cognitive demands are reflected in the assessments.
3. The assessments and marking are of an acceptable standard and consistency.
4. The moderator must make judgements about the comparability of learner performance across schools; whilst recognising that teachers teach in different ways.
5. The subject specialist/moderator must identify areas in which a teacher may need development and support and must ensure that this support is provided.

4.4.1 Internal moderation

Assessment must be moderated according to the internal moderation policy of the School, Provincial and National Departments. Moderation is a continuous process. The moderator's involvement starts with the planning of assessment methods and instruments and follows with continuous collaboration with and support to the assessors. Internal moderation creates common understanding of topics and skills and maintains these across the learning programmes.

4.4.2 External moderation

External moderation is conducted by the Districts and or Provincial offices, Department of Basic Education, Umalusi and, where relevant, the QCTO. The external moderator:

- Monitors and evaluates the standard of all summative assessments;
- Maintains standards by exercising appropriate influence and control over assessors;
- Ensures proper procedures are followed;
- Ensures summative integrated assessments are correctly administered;
- Observes a minimum sample of 12 summative assessments in total;
- Gives written feedback to the relevant quality assessor; and
- Moderates in case of a dispute between an assessor and a student.

Policy on inclusive education requires that assessment procedures for students who experience barriers to learning be customised and supported to enable these students to achieve their maximum potential.

Moderation is therefore an on-going process and not a once-off end-of-year event.

4.5 General

This document should be read in conjunction with:

- White Paper 6 on Special Needs Education: Building an Inclusive Education and Training System (2001);
- *National Policy Pertaining to the Programme and Promotion Requirements of the National Curriculum Statement Grades R – 12*; and (NPPPPR) (2011);
- *National Protocol for Assessment Grades R – 12. (NPA) (2011)*;
- *Guidelines for Responding to Diversity in the Classroom through the Curriculum and Assessment Policy Statements (2011)*;
- *Guidelines to Ensure Quality Education and Support in Special Schools and Special School Resource Centres (2013)*;
- *Policy on Screening, Identification, Assessment and Support (2014)*;
- *Guidelines for Full-service/Inclusive Schools (2010)*; and
- *Standard Operating Procedures for Assessment of Learners who Experience Barriers to Assessment (2016)*.

SECTION 5:

RESOURCES

Annexure A

POSSIBLE PRACTICAL TASKS

Year	Year 1	Year 2	Year 3	Year 4
Term 1	<ul style="list-style-type: none"> • Simulated DB Wiring • Plug circuits • Light circuits • Testing of a cable • Demonstrating the safe use of tools • First aid demonstration 	<ul style="list-style-type: none"> • First aid demonstration • Demonstrating safe use of tools • Soldering mat (any design) • Copying a piece of metal (Sawing, drilling, filing) • Simulate pipe (PVC and Metal) installation 	<ul style="list-style-type: none"> • Design a safety sign • Build a circuit to prove ohms law • Demonstrate use of power tools • Assemble and disassemble a basic battery charger • Test electrical and electronic components • Build a circuit using the components 	<ul style="list-style-type: none"> • Demonstrate the use of a fire extinguisher • Complete a first aid record • Demonstrate the correct way for CPR • Build a regulated power supply
Term 2		<ul style="list-style-type: none"> • Testing components • Build circuits with resistor • Measuring of voltage, current and resistance • Testing a cable 	<ul style="list-style-type: none"> • Cable joint using soldering methods • Simulated cable installation using steel conduit • 	<ul style="list-style-type: none"> • Test an armoured cable • Do an armoured cable joint • Installing an armoured cable using cable glands
Term 3		<ul style="list-style-type: none"> • PVC Pipe work (Bending) • Wiring TWO Way light circuits • Wiring intermediate light circuits 	<ul style="list-style-type: none"> • Test geyser and stove sub circuits • Build a three heat stove switch circuit • Build a five heat stove switch circuit 	<ul style="list-style-type: none"> • Complete a full domestic installation • Connect a day night switch to a installation

Year	Year 1	Year 2	Year 3	Year 4
		<ul style="list-style-type: none"> • Wiring plug circuits • Plug polarity test 	<ul style="list-style-type: none"> • Test an oven thermostat • Test a multiheat • Draw geyser and stove sub circuits • Fault finding on home appliances • Assemble and disassemble home appliances. 	
Term 4		<ul style="list-style-type: none"> • Test an electrical motor • Test a transformer 	<ul style="list-style-type: none"> • Test of an electrical motor (Electrical & Mechanical) • Visual inspection of an electrical motor • Connecting a direct on line single phase motor (Universal, capacitor start, capacitor start and run 	

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