



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

Curriculum and Assessment Policy Statement Technical Occupational

Year 1 - 4

MECHANICAL TECHNOLOGY:

WELDING

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).

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.

1.3.3.1. 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)		3 Hours for Home Language	
All 11 official languages (Afrikaans, English, isiNdebele, isiXhosa, isiZulu, Siswati, Sesotho, Setswana, Sepedi, Tshivenda, Xitsonga)		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 Technical Occupational: Electives	Time
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</p> <p>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 MECHANICAL TECHNOLOGY: WELDING

2.1 What is Welding?

Welding is a fabrication or sculptural process that joins materials, usually metals and other materials, by causing coalescence. This is often done by melting the work pieces and adding a filler material to form a pool of molten material (the weld pool) that cools to become a strong joint, with pressure sometimes used in conjunction with heat, or by itself, to produce the weld.

Many different energy sources can be used for welding, including a gas flame, an electric arc, includes welding (gas, electric, MIG/MAGS), developments, working with sheet metal and the manufacturing of structures. Modern welding techniques includes manual methods like shielded metal arc welding, now one of the most popular welding methods, as well as semi-automatic and automatic processes such as gas metal arc welding.

Metalworking is the process of working with metals to create individual parts, assemblies, or large-scale structures. The term covers a wide range of work from large ships and bridges to precise engine parts and delicate jewellery. It therefore includes a correspondingly wide range of skills, processes, and tools. Metalworking is a science, art, hobby, industry and trade. Modern metalworking processes, though diverse and specialized, can be categorized as forming, cutting, or joining processes. Today's machine shop includes a number of machine tools capable of creating a precise, useful work piece.

2.2 Topics to be studied in Welding

1. Safety and first aid – Occupational Health and Safety (OHS) Act;
2. Workshop environment
3. Drawings (rough sketches, simple drawing ISO, Ortho and CAD welding related)
4. Tools and equipment (hand, power and machine)
5. Materials – ferrous and non-ferrous materials
6. Joining methods – permanent and semi-permanent.
7. Welding (operations/procedures and equipment).

2.3 Specific Aims:

The learner is able to:

1. Adhere to and identify safe working practices and demonstrate safe working conditions daily, also adopting proper safety and first aid procedures.
2. Demonstrate knowledge of the welding industry and its productivity requirements, by applying appropriate work-procedures.
3. Understand and interpreting work instructions and drawings for the completion of projects.
4. Apply welding technology, techniques, processes and skills, as applied in the fabrication and welding industry, using appropriate tools and measuring equipment.
5. Identify Ferrous & Non-Ferrous metals the differences, applications and uses of them.
6. Demonstrate the different welding processes: Arc (AC/DC), MIG, TIG, Brazing, Soldering and spot welding.
7. Apply a variety of welding, oxy-fuel cutting and oxy-fuel joining processes.

2.4 Requirements for Welding as a subject

2.4.1: Time Allocation

The total number of hours allocated for the subject in a five-day cycle is 13 ½ hours. Sufficient time must be allocated in the school timetable for the practical work required to be done.

2.4.2 Resources

Human resources

Welding requires a trained subject specialist (should be a person that has at least 5 years' industry experience). It is preferred that the Educator offering Welding is an artisan, technician, technical educator that has been in the Welding industry.

Welding Educators are required to:

- Teach the subject content with confidence, professionalism and in a relaxed firm manner.
- Plan and execute Theory and Practical lessons/work in a manner that would be suitable for the learners.
- Provide workshop that is properly equipped, clean, safe and first aid friendly for learners.
- Keep proper records of all learners and results from all SBA and PAT.

- Implement innovative methods to keep learners interested in the subject.
- Maintain and service the workshop, tools, and instruments as a whole.
- Produce working PAT projects for learners one for every term and scale at the learners' ability.
- Educator must carry out SBA regularly, at the end of every term correct break down of learner's progress.

Learner Resources:

Each learner should be in possession of the following:

- Workbook.
- Overall.
- Safety steel cap boots.
- Welding helmet.
- Clear safety glasses.
- Leather gloves.
- Tape measure.

2.4.3 Infrastructure, equipment and budget.

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

Infrastructure:

- Welding cannot be implemented in a school without an equipped workshop.
- Electricity supply to the workshop is crucial, preferably a three phase, four-wire supply, but at least single phase with a high current circuit breaker.
- Lighting and ventilation is of extreme importance and a workshop should ideally have multiple exits with doors that open outward.
- Tools and equipment should have sufficient storage and well-developed storage management system with an up to date inventory. Shelves 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, off-cut materials as well as chemical waste. The requirements of the Occupational Health and Safety (OHS) Act 85 of 1993 need to be complied with at all times.

- Machinery on stands should be permanently affixed to the floor, with isolation switches for the mains supply. All machines should have working machine guards.
- Electrical motors should ideally be painted bright orange. Specification plates should be clearly legible.
- The workshop must have a lockable mains distribution board. The workshop must be fitted with an emergency cut of switch/s which is/are easily accessible at all times. The red, mushroom type, emergency switch should preferably be lockable to prevent accidental re-connection with mains in the case of it being activated.
- Safety rules must be displayed on posters in the workshop.

Equipment

SUGGESTED TOOLS AND EQUIPMENT

SAFETY			
MUST HAVE			• Optional
<ul style="list-style-type: none"> • 1or 2 piece Overall (1/ learner) • Steel capped safety boots (1/ learner) • Safety Glasses (1/ learner) 	<ul style="list-style-type: none"> • Welding helmet (1/ learner) • Leather Apron (1/ learner) • Leather gloves (1/ learner) 	<ul style="list-style-type: none"> • Leather apron (1/ learner) • Ear Muffs (1/ learner) 	<ul style="list-style-type: none"> • Skull cap • Leather anklets • Auto dark welding helmet
<ul style="list-style-type: none"> • Fire extinguishers 300sqm workshop (5/ workshop) 	<ul style="list-style-type: none"> • Sand buckets (3/ workshop) 	<ul style="list-style-type: none"> • First Aid kit (wall mounted fully stocked) 	
<ul style="list-style-type: none"> • Full Face clear grinding shield (5/ workshop) 		<ul style="list-style-type: none"> • Water hose on reel (1/ workshop) 	

TOOLS AND EQUIPMENT			
MUST HAVE			Optional 1 of each item per workshop
Hand Tools	Hand Power Tools	Machine Tools	
<ul style="list-style-type: none"> • Measuring Tools: • Tape Measure (1/ learner) • Steel ruler (5/workshop) • Veneer Callipers (2/ workshop) • Allen keys set (1 sets / workshop) 			<ul style="list-style-type: none"> • Height Gauge • Micro-meter • Laser line gauge
<ul style="list-style-type: none"> • Marking Out Tools: • Engineering Square Set (15/ workshop) • Scriber (5/workshop) • Boilers Marking Chalk (2box/ Term) • Blue marking ink (2x300 ml/ Term) • Sliding bevel (5/workshop) • Callipers: Inside & Outside (1 set) • 200 mm Dividers (3/ workshop) • 300 mm Dividers (3/ workshop) 			<ul style="list-style-type: none"> • Yellow Paint marker • Chalk line • Spirit level

<ul style="list-style-type: none"> • Cutting: • Hack saw (1/ learner) • Junior Hack Saw (5/workshop) • Hand held tin snips (5/workshop) • Cole chisel (5/workshop) • Body punches (1 set / workshop) • Hole Saws (1 set / workshop) 	<ul style="list-style-type: none"> • Jig saw (1/ workshop) • 115 mm Angle Grinder (5/workshop) • 250 mm Angle Grinder (1/ workshop) • Oxy/Acetyl bottles 10 kg (1/ workshop) 	<ul style="list-style-type: none"> • Plasma cutter (1/ workshop) • Heavy Duty-Cut Off Saw 450 mm (1/ workshop) • Guillotine (1/ workshop) • Portable Band Saw (1/ workshop) • Hydraulic Break press 2.5 meter (1/ workshop) 	<ul style="list-style-type: none"> • Portable Gas Bottles
<ul style="list-style-type: none"> • Welding: • Positive& Negative welding cables (1set/ machine) • Welding screen 3m (4/ workshop) 		<ul style="list-style-type: none"> • Inverter AC/DC welder (5/workshop) • Core wire MIG welder (2/workshop) • Spot welder (1/ workshop) • TIG welding torch (1/ workshop) 	<ul style="list-style-type: none"> • Oil cooled welder
<ul style="list-style-type: none"> • Grinding: • 200 mm wire brush (5/ workshop) • Chipping hammer (5/ workshop) 	<ul style="list-style-type: none"> • 115 mm angle grinder (2/ workshop) • 300 mm angle grinder (2/ workshop) • Die grinder 250 mm (1/ workshop) 		<ul style="list-style-type: none"> • Sander on stand • Die grinder
<ul style="list-style-type: none"> • Drilling: • Jobber drill bit set (2/ workshop) • High speed Hole-saw (1 set/ workshop) • Multi stage drill bits (2 set/workshop) 	<ul style="list-style-type: none"> • Hand held drill (2/ workshop) • Rotary SDS held drill (1/ workshop) 	<ul style="list-style-type: none"> • Drill press (2 / workshop) 	<ul style="list-style-type: none"> • Cross drill vice • Tap & die set
<ul style="list-style-type: none"> • Joining: • 150 mm G clamps 			<ul style="list-style-type: none"> • Sheet metal clamps

<ul style="list-style-type: none"> (3 sets/ workshop) • 300 mm G clamps (3sets/ workshop) • C clamp grip plier (3sets/ workshop) • Welding magnets (4 sets/ workshop) • Corner jig clamp (2 / workshop) • Rivet gun (2 / workshop) 			<ul style="list-style-type: none"> • Plate welding plier
<ul style="list-style-type: none"> • Shaping / Forming: • Bench grinder (5/ workshop) • Hand held files (15/ workshop) 	<ul style="list-style-type: none"> • Finishing sander (1/ workshop) 	<ul style="list-style-type: none"> • 100 mm Belt sander (1/ workshop) 	<ul style="list-style-type: none"> • Orbital sander
<ul style="list-style-type: none"> • Other Accessories: • Bench vice (5/ workshop) • Work benches (3/ workshop) • Extension cords 10&20 m (2/ workshop) • Screwdrivers set of 8 (2/ workshop) • Hammers-ball pin (6/ workshop) • Bolts, nuts and washers • Self- tapers • Two pin adaptor (2/ workshop) • Multi plug adapter (3/ workshop) 	<ul style="list-style-type: none"> • Radio (1/ workshop) • Computer (1/ workshop) • Overhead Projector (1/ workshop) • Colour Printer (1/ workshop) • 16 gig Flash drive (1/ workshop) • CAD Software- one of the following • Ally-CAD, Auto-CAD 	<ul style="list-style-type: none"> • Extractor fan (1/ workshop) • Compressor 4 Bar 100 lt tank (1/ workshop) 	<ul style="list-style-type: none"> • Scroll bender • Roll slip bender • Sheet metal folder • Compressor • Spray gun & access • Drawing board • 1 Tera-byte Hard Drive

Consumable items: (minimum requirements)

Hand grit soap	Paper towels	Gas argon, oxygen, acetylene, cougar, LP	Grinding discs 115 mm
Welding rods	Drill bits 1-10 mm	Grinding discs 115mm and 250 mm	Grinding discs 250 mm
Steel brushes	Rags 1/5 kg/term	Boiler makers chalk	Masking tape 15,25 & 50 mm
Cut-off discs 115-350 mm	Flap discs 115 mm	Hack saw blades	5 kg of waste rags
Sand paper	Wire wheel and brush	Purple scotch brite	Band saw blades
Flap wheels 115 mm	Sanding discs 115 mm	Sanding discs 250 mm	Bench grinder wheel fine grit
Anti-Splatter Spray	Oxy/Act cutting nozzles	Oxy/Act flash Backs	Bench grinder wheel course grit
Clear glass for welding helmet	Green glass for welding helmets		

Finances:**Budget and inventory**

A budget must be allocated for the subject. The amount will be determined by the number of learners taking the subject across all the years and the nature of the practical work required as stipulated in the curriculum. The budget needs to be revised annually and must consider all resources needed per year. The funding must make provision for maintenance of equipment and the replacement over the years.

Resourcing could be sub divided into the following categories:

- ☐ Safety Equipment
- ☐ Tools and Equipment
- ☐ Consumable Materials
- ☐ Practical Assessment Task Resources (PAT)
- ☐ Teaching and Learning Support Material
- ☐ Maintenance

A stock inventory must be maintained by the teacher and verified annually by a Senior Management Team member.

2.5 Career opportunities

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

- Continued studies at a college in the (NCV) in a vocational pathway.
- Working as an entrepreneur or working with one.
- Artisan assistant (Semi Skilled);
- Welder (Coded).
- Boiler maker.
- Pressure welder.
- Ship builder.
- Rigger.
- Pattern maker.

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. Safety & First Aid	General workshop safety and basic first aid workshop practices in the work area. Safety in the use, handling and storage of hand tools, Good house-keeping requires sweeping, cleaning and proper storage of all tools used on a daily basis in the workshop.	Safety and first aid workshop practices HIV/AIDS awareness, machine safety practices. Good house-keeping requires sweeping, cleaning and proper storage of all tools used on a daily basis in the workshop.	Safety and first aid workshop practices HIV/AIDS awareness, machine safety practice. Good house-keeping requires sweeping, cleaning and proper storage of all tools used on a daily basis in the workshop.	Safety and first aid workshop practices HIV/AIDS awareness, Machine safety practices. Good house-keeping requires sweeping, cleaning and proper storage of all tools used on a daily basis in the workshop.
2. Workshop environment	Layout of the workshop and the demarcated areas of operation. Cleaning and storage of tools and equipment	Layout of the workshop and the demarcated areas of operation. The proper procedure to cleaning and storage of tools and equipment	Layout of the workshop and the demarcated areas of operation. The proper procedure to cleaning and storage of tools and equipment	Layout of the workshop and the demarcated areas of operation. The proper procedure to cleaning and storage of tools and equipment
3. Drawings	Implementation of drawings in the workshop. (rough, ISO and ORTHO)	Implementation of drawings in the workshop. (rough, ISO and ORTHO)	Implementation of drawings in the workshop. (Rough, ISO ORTHO and basic 3D shapes.)	Implementation of drawings in the workshop. (Rough, ISO, ORTHO and basic 3D shapes.)
4. Tools and	Hand and	Hand, measuring tools, portable	Hand, measuring tools, portable	Hand, measuring tools, portable

TOPIC	Year 1	Year 2	Year 3	Year 4
equipment	measuring tools	power Tools	power Tools and all related equipment for welding	power Tools and all related equipment for welding
5. Materials	Origin of steel, profiles	Origin of steel, Profiles and uses	Properties non and ferrous, profiles of metals	Properties and uses metals, profiles of metals
6. Joining methods	Different types of joining. Demonstrate: A Tack, butt and a fillet weld	Joining method (ARC)	Joining method (ARC and GAS) Free hand Gas cutting	Joining method (ARC, GAS, MIG and TIG) Free hand GAS and Plasma cutting
7. Welding operations	All the different types welding equipment, safety and storage. Different types of welding procedures and operations (ARC & GAS)	All the different types welding equipment, safety and storage. Different types of welding procedures and operations (ARC & GAS)	All the different types welding equipment, safety and storage. Different types of welding procedures and operations (ARC GAS, MIG and TIG)	All the different types welding equipment, safety and storage. Different types of welding procedures and operations (ARC, GAS, MIG and TIG)

3.2 Content outline per term

Year 1

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1	Introduction: (orientation)	Describe and apply the following: <ul style="list-style-type: none"> • Workplace layout, • Workplace rules, • Working opportunities in industry 	<p>Theoretical and practical explanation to show the Learner the workplace layout while workplace rules are explained. Videos and wall chart information.</p> <p>Worksheet:</p> <ul style="list-style-type: none"> • Oral discussions in groups • Access to information from reference books and internet resources • Sort information • Written and visual presentations • Practical demonstration <p>Explanation on the different opportunities that are available in Industry</p> <ul style="list-style-type: none"> • Welder. (coded) • Boiler maker • Grinder • Vessel maker etc.
2	Safety	Demonstrate and apply the following safety practises	Theoretical explanation as well as practical demonstration

	<p>&</p> <p>First aid</p>	<ul style="list-style-type: none"> • Safety procedures • First boxes • Protective clothes for body, head, eyes, hands and feet • Safety signs, colour codes used <p>Explain and demonstrate how to clean and dress a wound</p> <p>Apply the following conditions</p> <ul style="list-style-type: none"> • Unsafe acts & conditions • Good house-keeping • General workshop rules • By explaining and showing how a workshop should be kept cleaned on a daily basis. • What unsafe conditions are, the reasons for workshop to be kept safe and clean daily. 	<p>Videos and charts to be demonstrated.</p> <p>Worksheets: Oral and Written discussions:</p> <ul style="list-style-type: none"> • In groups / teams • Reference books and charts with suitable content • Practical activity <p>Show how to clean and dress a wound properly and to register all injuries in a log book.</p> <ul style="list-style-type: none"> • The completion of the First Aid to any wound needs to be done by a Qualified first aid person and reported to the safety Officers for official recording. <p>Worksheet and Video content on:</p> <ul style="list-style-type: none"> • Safe workshop rules and practices • First aid charts and videos, show what happens in unsafe work conditions • Introduce the learners to how the workshop is cleaned daily.
3	<p>Measuring</p> <p>Hand tools</p>	<p>Select use & care: Hand measuring tools</p> <ul style="list-style-type: none"> • Tape measure • Steel ruler • Meter stick 	<p>Show learners the hand tools how /care and storage of them.</p> <p>Demonstrate the measurement equipment and why it is so important that these tools are taken care of and properly stored away</p>

		<ul style="list-style-type: none"> • Veneer Calliper • 90deg square 	The introduction of a Veneer calliper in which an Educator explains the operation of how to measure thickness, example plate and drill
4	Hand tools	<ul style="list-style-type: none"> • Sliding adjustable square <p>Identify and describe the caring and demonstrate the correct use and safety of the following hand tools:</p> <ul style="list-style-type: none"> • Screw Drivers (flat / star) • Hammers • Files (Different shape files) • Spanners (opened and closed type) • Tin snip (straight) • Drill bits • Scriber • Combination pliers • Hack saw • Vice 	<p>bit thickness. Physical and video demonstration on this operation is necessary in order for learners to comprehend this tools operation.</p> <p>Worksheet with picture illustration of hand tools and videos.</p> <p>Use the practical way of describing of hand tools.</p> <p>Hand tools are best taught when busy in a practically demonstrated.</p> <p>Attention should be paid with the safe storage and care of these tools.</p>
5-6	Materials	Identify: Non & Ferrous metals (profile & use).	Show the different profiles that are used that materials are made in.

		<p>Show the physical difference between non and ferrous metals</p> <ul style="list-style-type: none"> • Brass • Copper • Aluminium • Mild steel • Stainless steel • Cast iron • Copper • Show example and uses of the materials in the workshop 	<p>Explain and Demonstrate the different types of materials (mild steel, stainless steel, brass) and the profile.</p> <p>Show example and uses of the materials in the workshop.</p> <p>Learners need to be taken around the school premises and shown where these materials are used</p> <ul style="list-style-type: none"> • Stairs cases railings • Gates at the school • Support beams • Window frames
7-8	Joining	<p>Understand the following</p> <ul style="list-style-type: none"> • Shielded metal arc welder (components of the machine and use) (AC/DC) • Demonstrate all the components of an Arc welder and the proper way to connect it before use • The different colours that is used to for the identification of positive and earth cables • Do a tack weld on measured material 	<p>The educator needs to show learners the components of a welder and how the welder operates.</p> <p>Use the internet/media to show visually what welding processes are available.</p> <p>Demonstrate to learners' difference between AC/DC welders:</p> <ul style="list-style-type: none"> • Define AC (Alternating Current) • Define DC (Direct Current) <p>Educator should demonstrate to learners how to do a tack weld correctly</p>

			on two pieces of properly prepared material. But this must be mechanically strong not to break easily.
9-10	Assessment	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 Demonstration (Measuring, cutting and Tack Welding) = 25% of the Term mark.</p> <p>The Learners must be able to demonstrate certain skills acquired during the term. This is in the form of a single task and not part of the Terms practical model.</p> <p>Learner measures, cuts and prepare two pieces of material as per the drawing. The learner must produce two tack welds that should be mechanically strong. All three stages must be assessed.</p> <ul style="list-style-type: none">• Measuring• Mark off• Cutting• Cleaning off sharp edges• Tack Weld <p>Total for Activity 1 Marks to be converted to 25% of the total term mark.</p> <p>Activity 2 – PRACTICAL ASSESSMENT TASK – PAT (Practical Project) = 50% of term mark.</p> <p>Fundamental knowledge = 25%</p> <p>Practical learning areas = 25%</p> <p>Learners must now produce a practical project (PAT) using the all the method of construction (in Weeks 1 – 8) which can be assessed to evaluate their acquisition skills. This project should involve the skills, techniques and knowledge of the theory component.</p>			

Assessments are done according to a rubric which includes all the skills acquired during the term.

- Examples of projects are in the Addendum.

Activity 3 – Formal written or Oral Theory assessment = 25%.

Scope of work that is done during the term.

Annexure A: Theory Assessment: Oral and /or Written Pages

Theory section: This section comprises of all the above work done in weeks 1 through 8 inclusions should be pictures and questions with a multi answer block. Pictures should constitute a major part of this section.

Annexure B: Practical Assessment: Page

Practical section: learners are now assessed on their understanding of safety, standards and practices as well as measurement which forms the basis of the all practical work done in the workshop. Learners in the first year should be able complete a model (which should be at their level, but the ability to finish the model).

Year 2 Term 1

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1	Introduction: (orientation)	<p>Understand the Welding concept and the work place layout.</p> <p>Enter and exit the workshop. As well as observe the safety procedure with entering and exiting a workshop.</p> <ul style="list-style-type: none"> Identify the safety signs that indicate the doors used for evacuation Explain the safety evacuation drill and perform it. 	<p>Explain the Welding definition to the learners and orientate them on the entrance and exits of the workshop.</p> <ul style="list-style-type: none"> Videos about safety All exits and entrances should be marked and explained Demonstrate in a class group how to evacuate the workshop using a proper evacuation drill Written presentations Sort information
2	<p>Safety, first aid</p> <p>HIV and AIDs</p> <p>(OHS Act)</p>	<p>Demonstrate knowledge for the following</p> <ul style="list-style-type: none"> Safety procedures First boxes Protective clothes Safety signs <p>Learners need to explain the concept and application of how to clean and dress a wound.</p>	<p>Theoretical explanation as well as practical demonstration.</p> <p>Videos and charts to be demonstrated.</p> <p>Worksheets: Oral and Written discussions:</p> <ul style="list-style-type: none"> In groups / teams Reference books and charts with suitable content Practical activity. Role play emergency procedures <p>Show how to clean and dress a wound properly and to</p>

		<p>Explain the following conditions:</p> <ul style="list-style-type: none"> • Personal safety (PPE – Personal Protective Equipment) • Unsafe acts & conditions • Good house-keeping • General workshop rules • By explaining and showing how a workshop should be kept cleaned on a daily basis. • What unsafe conditions are, the reasons for workshop to be kept safe and clean daily <p>Explain the proper protocol for dealing with victims with HIV and AIDs.</p> <ul style="list-style-type: none"> • Wearing disposable latex medical gloves. • Checking yourself for no open wounds • Treating the HIV and AIDs victim with caution • Proper disposal of all cleaning materials 	<p>register all injuries in a log book</p> <p>Worksheet and Video content on :</p> <ul style="list-style-type: none"> • Safe workshop rules and practices. • First aid charts and videos, show what happens in unsafe work conditions. • Introduce the learners to how the workshop is cleaned daily. <p>Educator to demonstrate the HIV and Aids protocol:</p> <ul style="list-style-type: none"> • Videos and charts • Oral discussions • Worksheets • Present information visually • Seek information from nursing sister
3-4	<p>Equipment:</p> <p>Measuring</p> <p>Hand tools</p>	<ul style="list-style-type: none"> • Identify measuring tools and the proper use thereof. • Accurately measure length, width and thickness in mm 	<p>Educator with the aid of theory show learners hand tools and how to care and storage of them.</p> <p>Demonstrate the measurement equipment and why it is so important that these tools are taken care of and properly stored away.</p>

		<p>Select use & care: Hand measuring tools.</p> <ul style="list-style-type: none"> • Tape measure • Steel ruler • Meter stick • Veneer Calliper • 90° square • Sliding adjustable square • Scriber and Marking gauge <p>Explain and demonstrate the proper procedure when drilling a hole into material.</p> <p>The five-point step should be put into practice</p>	<ul style="list-style-type: none"> • Demonstrate how to measure and read in mm • Educate how to use the measuring equipment • Demonstrate how important accuracy is • Explain how proper right angles are obtained • Show learners modern technology advancements <p>The educator must explain and demonstrate the 5 point procedure of how a hole should be drilled into material.</p> <ul style="list-style-type: none"> • Measure and mark the spot • Centre-punch the spot • Drill a pilot hole • Drill the hole that is required (finish hole) • Chamfer the holes both sides to remove all sharp edges.
5-6	Materials	<p>Identify: Non & Ferrous metals (profile & use).</p> <p>Show the physical difference between non- ferrous and ferrous metals.</p> <p>Identify the materials that they use most frequently.</p> <ul style="list-style-type: none"> • Brass • Copper 	<p>Theoretical explanation of the topic:</p> <p>Show the different profiles that are used that materials are made in.</p> <p>Educator can explain and use a magnet to show the difference between non-ferrous and ferrous materials. The spark test is by using a bench grinder shown spark patterns differ with different materials</p>

		<ul style="list-style-type: none"> Aluminium Mild steel Stainless steel Cast iron Copper Show example and uses of the materials in the workshop 	<p>(backup test for non & ferrous materials)</p> <p>Explain and Demonstrate the different types of materials.</p> <ul style="list-style-type: none"> Theory can be explained while giving a practical demonstration. Spend more time explaining the material differences as this will give the learner the proper information when choosing the appropriate material. Provide the learner with the notes and descriptions of these materials. <p>Show example and uses of the materials in the workshop.</p>
7-8	Joining methods	<p>Explain the following types of joining methods:</p> <ul style="list-style-type: none"> Riveting Use nuts and bolts Welding Prepare material before a tack weld Perform a tack weld Perform a butt weld no longer than 30 mm Clean and present a butt weld 	<p>Use practical demonstrations to show learners the components that should be used to complete a successful joint:</p> <p>Educators explanation and demonstration for Riveting:</p> <ul style="list-style-type: none"> Prepare material before riveting The correct holes to be drilled for riveting The riveting procedure <p>Educators explanation and demonstration for use of nuts and bolts method:</p> <ul style="list-style-type: none"> Prepare material before nuts and bolts to be used

			<ul style="list-style-type: none">• The correct holes to be drilled for bolts• The nuts and bolts tightening procedure• The correct nuts and bolts to be used (mechanical strength) <p>Educators explanation and demonstration for Welding method:</p> <ul style="list-style-type: none">• Prepare material before welding• Tack weld• Butt weld• Clean weld off to present <p>Both must have mechanical strength to be classified as the joints listed</p>
9 – 10	Formal Assessment	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 Demonstration (Measuring, cutting and Tack Welding) = 25% of the Term mark.

The Learners must be able to demonstrate certain skills acquired during the term. This is in the form of a single task and not part of the Terms practical model.

Learner measures, cuts and prepares two pieces of material as per the drawing. The learner must produce two tack welds that should be mechanically strong. All three stages must be assessed.

- Measuring
- Cutting

- Cleaning off sharp edges
- Tack Weld
- Butt Weld

Total for Activity 1 Marks to be converted to 25% of the total term mark.

Activity 2 – PRACTICAL ASSESSMENT TASK – PAT (Practical Project) = 50% of term mark.

Fundamental knowledge = 25%

Practical learning areas = 25%

Learners must now produce a practical project (PAT) using the all the method of construction (in Weeks 1 – 8) which can be assessed to evaluate their acquisition skills. This project should involve the skills, techniques and knowledge of the theory component.

Assessments is done according to a rubric which includes all the skills acquired during the term. Marks total 50% of the term.

- Examples of projects are in the Addendum.

Activity 3 – Formal written or Oral Theory assessment = 25%.

Scope of work that is done during the term.

Assessment: consists of two sections theory 25% and practical 75% = 100%

Annexure C: Theory Assessment: Oral and /or Written Pages

Theory section: (oral or written) score allocation 25%: comprises of all the above work done in weeks 1 through 8 inclusions should be pictures and multi answer questions. Pictures should constitute a major part of this section.

Annexure D: Practical Assessment: Pages

Practical section: Learners should now be ready to for an assessment with a use of hand tools so that the theoretical aspect can be implemented. Measurement

now plays a role as this is the foundation to which all work can commence in the workshop.

At the end of this term: A project should be completed as evidence of the learner's ability.

(NB! Not all learners will be able to produce an exact reproduction of the example the educator has provided)

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1-2	Re-Cap Safety and Apply work site practices	<p>Demonstrate knowledge for the following</p> <ul style="list-style-type: none"> • Safety procedures • First boxes • Protective clothes • Safety signs <p>Explain the application of how to clean and dress a wound.</p> <p>Explain the following conditions:</p> <ul style="list-style-type: none"> • Personal safety (PPE – Personal Protective Equipment) • Unsafe acts & conditions present in the workshop. • Good house-keeping and the safe storage of tools • General workshop rules • Demonstrate a workshop is cleaned and explain why • What unsafe conditions are, the reasons for workshop to be kept safe and clean daily 	<p>Theoretical explanation as well as practical demonstration.</p> <p>Videos and charts to be demonstrated.</p> <p>Worksheets: Oral and Written discussions:</p> <ul style="list-style-type: none"> • In groups / teams • Reference books and charts with suitable content • Practical activity • Role plays emergency procedures <p>Show how to clean and dress a wound properly and to register all injuries in a log book</p> <p>Worksheet and Video content on:</p> <ul style="list-style-type: none"> • Safe workshop rules and practices • First aid charts and videos, show what happens in unsafe work conditions • Introduce the learners to how the workshop is cleaned daily

		<p>Explain the application and the proper protocol for dealing with victims with HIV and AIDs.</p> <ul style="list-style-type: none"> • Wearing disposable latex medical gloves • Checking yourself for no open wounds • Treating the HIV and AIDs victim with caution • Proper disposal of all cleaning materials 	<p>Educator to demonstrate the HIV and Aids protocol:</p> <ul style="list-style-type: none"> • Videos and charts • Oral discussions • Worksheets • Present information visually • Seek information from nursing sister
3- 5	<p>Equipment:</p> <p>Hand tools</p> <p>Power Hand Tools</p>	<p>Explain the selection, use and care for engineering hand tools and hand power tools.</p> <p>Hand tools examples:</p> <ul style="list-style-type: none"> • G clamps • Welding clamps • Combination Pliers • Hack saw and junior • Wire cutters • Side cutters • Vice grips • Bolt cutters • Spanners and sockets • Hand Files <p>Power tools examples:</p>	<p>Theoretical explanation and demonstrations of the topics:</p> <ul style="list-style-type: none"> • The theory can be explained while doing a practical demonstration but pen on paper is important • Provide the learner with the appropriate note where textbooks are not available • Attention must be given to correct terminology, safe use and proper care of tools is required • All topics and content should be covered in theory <p>Demonstrate the correct way in which power tools need to be stored and cared for.</p> <p>The correct way by demonstrating the care repair and storage of electrical cabling.</p>

		<ul style="list-style-type: none"> • 115mm angle grinder • Hand drill 13mm chuck • Jig saw. • Die grinder. • 250 mm grinder. • SDS rotary drill. • 300 mm cut off saw. • Angle grinder (big) 250 mm. <p>Explain the following:</p> <ul style="list-style-type: none"> • Repair and replace a faulty 3 core cable. • Repair and replace a faulty 3 pin plug. • Store and clean power tools. • Proper care and storage of extension leads. 	<ul style="list-style-type: none"> • How to replace a faulty cable on a hand power tool, following the correct procedures • How to replace a 3pin 240vac plug • How to replace a switch and carbon brushes.
6,7	Materials	<p>Demonstrate sound understanding of</p> <ul style="list-style-type: none"> • Non-ferrous and Ferrous materials • The difference applications where they are used. • Shelf space for materials • Care a preventative maintenance for materials to be stored. • Explain how mild steel and galvanised materials 	<p>Theoretical identification of materials in accordance with material specification sheet as included in work instructions.</p> <p>Educator should demonstrate the following tests for non and ferrous metals. Wall charts and internet information can be used to show the learners these applications.</p>

		need to be store separately.	<ul style="list-style-type: none">• The magnetic test.• The spark test <p>Display different materials used in industry.</p> <p>Demonstrate all safety precautions in relation to work site practices and procedures. On the storage of materials and why they need to be stored separately.</p>
8	Welding symbols and joints	<p>Explain the following:</p> <ul style="list-style-type: none">• Know the basics of welded joints and their terminology• Sketch and describe welding symbols used in the industry• Describe and sketch weld symbols in accordance with AWS and work instruction sheet.• Sketches of weld symbols can be done free hand or formal drawing format.	<p>Explain and describe weld symbols used in the industry in accordance with AWS instruction manual.</p> <p>Welding symbols is limited to those as prescribed in the AW Standards and practices.</p> <ul style="list-style-type: none">• Rough sketch of the symbol for a butt joint• Symbol for a lap joint
9 – 10	Formal Assessment	<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>	

Activity 1- Practical Demonstration (Measuring, cutting, welding, grinding and drilling) = 25% of the Term mark.

The Learners must be able to demonstrate certain skills acquired during the term. This is in the form of a single task and not part of the Terms practical model.

A learner measure cut and prepares two pieces of material as per the drawing. The learner must produce tack welds that should be mechanically strong. A fillet weld should be performed at least 30mm, a hole needs to be drilled and accuracy is really important. All five stages must be assessed.

- Measuring
- Cutting
- Welding
- Drilling
- Grinding

Total for Activity 1 Marks to be converted to 25% of the total term mark.

Activity 2 – PRACTICAL ASSESSMENT TASK – PAT (Practical Project) = 50% of term mark.

Fundamental knowledge = 25%

Practical learning areas = 25%

Learners must now produce a practical project (PAT) using the all the method of construction (in Weeks 1 – 8) which can be assessed to evaluate their acquisition skills. This project should involve the skills, techniques and knowledge of the theory component.

An assessment is done according to a rubric which includes all the skills acquired during the term. Marks total 50% of the term.

- Examples of projects are in the Addendum.

Activity 3 – Formal written or Oral Theory assessment = 25%.

Scope of work that is done during the term.

Assessment: consists of two sections theory 25% and practical 75% = 100%

Annexure C: Theory Assessment: Oral and /or Written Pages

Theory section: (oral or written) score allocation 25%: comprises of all the above work done in weeks 1 through 8 inclusions should be pictures and multi answer questions. Pictures should constitute a major part of this section.

Annexure D: Practical Assessment: Pages 61

Practical section: Learners should now be ready to for an assessment with a use of hand tools so that the theoretical aspect can be implemented. Measurement now plays a role as this is the foundation to which all work can commence in the workshop.

At the end of this term: A project should be completed as evidence of the learner's ability.

(NB! Not all learners will be able to produce an exact reproduction of the example the educator has provided)

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1-2	<p>Re-cap Safety and procedures.</p> <p>Re-Cap: - Welding symbols and joints</p>	<p>Explain all safety and First Aid, HIV and AIDS procedures.</p> <p>Know the basics of welded joints and their terminology</p> <p>Sketch and describe welding symbols used in the industry. Describe and sketch weld symbols in accordance with AWS and work instruction sheet.</p> <p>Sketches of weld symbols can be done free hand or formal drawing format.</p>	<p>Explain all safety, first aid HIV and Aids procedures, learners need to be shown all the signs and pictures to establish that safety should be first priority in the workshop. Use the projector and signs in the workshop.</p> <p>Recap: Welding symbols is limited to those as prescribed in the AW Standards and practices.</p>
3-4	<p>Equipment:</p> <p>Hand tools and</p> <p>Power Hand Tools</p>	<p>Explain and understand how to select, use and care for engineering hand tools and hand power tools.</p> <p>Hand tools examples:</p> <ul style="list-style-type: none"> • Circle divider • Bench vice 	<p>Theoretical explanation and demonstrations of the topics:</p> <ul style="list-style-type: none"> • The theory can be explained while doing a practical demonstration but pen on paper is important • Provide the learner with the appropriate note where textbooks are not available • Attention must be given to correct terminology, safe use and proper care of tools is required

		<ul style="list-style-type: none"> • Rubber mallet • Vice grips • Cole chisel • Allen and torque keys • Wire strippers • Circlip pliers inner and outer • Tin snips <p>Power hand tools examples:</p> <ul style="list-style-type: none"> • Nibbler • Portable hand drill • Sander • Heat gun • Vacuum cleaner <p>Do the following:</p> <ul style="list-style-type: none"> • Repair and replace a faulty 3 core cable • Repair and replace a faulty 3 pin plug • Store and clean hand power tools 	<ul style="list-style-type: none"> • All topics and content should be covered in theory <p>Demonstrate the correct way in which power tools need to be stored and also the way electrical cabling needs to be properly rolled up.</p> <p>Demonstrate and with the means of pictures and video show the operations of the following Power hand tools:</p> <ul style="list-style-type: none"> • Nibbler • Portable hand drill • Sander • Heat gun • Vacuum cleaner <p>The Educator needs to demonstrate the following:</p> <ul style="list-style-type: none"> • Repair and replace a faulty 3 core cable • Repair and replace a faulty 3 pin plug • Store and clean hand power tools
5	Drawings	<p>Explain and understand the following:</p> <ul style="list-style-type: none"> • Measuring • estimate and costing • calculate physical quantities and 	<p>Theoretical explanation by the Educator and to demonstrate and correctly read scales on the measuring instruments.</p> <ul style="list-style-type: none"> • Identify the appropriate instrument to measure a particular quantity. Carry out calculations correctly

		<ul style="list-style-type: none"> • explore, describe and • represent geometrical relationships in 2-dimensions in different life or workplace context <p>Explore transformations of two-dimensional geometric figures</p> <ul style="list-style-type: none"> • Square • Cone • Rectangle • Cube • Sphere • Triangle • Circle 	<ul style="list-style-type: none"> • Explain and demonstrate appropriate units measurement and calculation • Describe and identify properties of symmetrical shapes • Explain and show concepts of lines of symmetry in 2-dimensional figures using paper folding and reflections in the lines of symmetry • Demonstrate how learners are able to cut-out paper figures and assemble them into the required shapes that are needed <p>Show learners these shapes by means of chart diagrams and video link.</p>
6-8	<p>Welding process</p> <p>Arc Welder</p> <p>Equipment</p>	<p>Describe the shielded metal arc welding process</p> <p>Explain and demonstrate the importance of correct assembly of the shielded metal arc welding (SMAW) equipment, and the consequences of incorrect assembly, with reference to the vendor requirements.</p>	<p>Educator should theoretically explain terms and definitions used with welding terminology as recorded in international welding standards.</p> <p>How to repair broken cables and to maintain the equipment.</p> <ul style="list-style-type: none"> • Demonstrate the correct way to connect welding machine • The correct polarity connections • How to maintain equipment

		<p>Select, set up and conduct pre-operational checks of shielded metal arc welding equipment:</p> <p>Identify and connect an Arc weld for operation:</p> <ul style="list-style-type: none"> • Suitable power source • Earth clamp • Electrode holder • Welding settings <p>Proper care of:</p> <ul style="list-style-type: none"> • Welding helmet • Safety glasses • Leather gloves • Leather apron 	<ul style="list-style-type: none"> • The right equipment to use before you start to weld <p>Carry out pre-operational checks in accordance with manufacturer's specifications.</p> <p>Resources to include: manufacturer's operational manual, worksite practices and safety and Demonstrate verify and selection shielded metal arc welding equipment as specified on welding procedure specification environmental issues.</p> <p>The correct amperage to be used to weld different gauge materials.</p> <p>The correct size welding rods to be used for different types of material.</p> <p>Identify and rectify hazards relating to welding process in accordance with standard work site practices.</p>
9 – 10	Formal Assessment	<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 Demonstration (Measuring, cutting, welding, grinding and drilling) = 25% of the Term mark.</p> <p>The Learners must be able to demonstrate certain skills acquired during the term. This is in the form of a single task and not part of the Terms practical model.</p> <p>Learner measures, cuts and prepares two pieces of material as per the drawing. The learner must produce tack welds that should be mechanically strong. A fillet weld should be performed at least 30mm, a hole needs to be drilled and accuracy is really important. All five stages must be assessed.</p>	

- Measuring
- Cutting
- Welding
- Drilling
- Grinding

Total for Activity 1 Marks to be converted to 25% of the total term mark.

Activity 2 – PRACTICAL ASSESSMENT TASK – PAT (Practical Project) = 50% of term mark.

Fundamental knowledge = 25%

Practical learning areas = 25%

Learners must now produce a practical project (PAT) using the all the method of construction (in Weeks 1 – 8) which can be assessed to evaluate their acquisition skills. This project should involve the skills, techniques and knowledge of the theory component.

Assessments are done according to a rubric which includes all the skills acquired during the term. Marks total 50% of the term.

- Examples of projects are in the Addendum.

Activity 3 – Formal written or Oral Theory assessment = 25%.

Scope of work that is done during the term.

Assessment: consists of two sections theory 25% and practical 75% = 100%

Annexure C: Theory Assessment: Oral and /or Written Pages

Theory section: (oral or written) score allocation 25%: comprises of all the above work done in weeks 1 through 8 inclusions should be pictures and multi answer questions. Pictures should constitute a major part of this section.

Annexure D: Practical Assessment: Pages 61

Practical section: Learners should now be ready to for an assessment with a use of hand tools so that the theoretical aspect can be implemented. Measurement now plays a role as this is the foundation to which all work can commence in the workshop.

At the end of this term: A project should be completed as evidence of the learner's ability.

(NB! Not all learners will be able to produce an exact reproduction of the example the educator has provided).

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1 - 2	Re-cap Safety and procedures and Welding operations	<p>Explain all safety and First Aid, HIV and AIDS procedures.</p> <p>Explain the following:</p> <ul style="list-style-type: none"> Select, set up and conduct pre-operational checks of shielded metal arc welding equipment Prepare work-pieces prior to welding Identify, verify and selection shielded metal arc welding equipment as specified on welding procedure specification Prepare work pieces prior to welding as specified on drawing and worksite procedures 	<p>Explain all safety, first aid HIV and Aids procedures, learners need to be shown all the signs and pictures to establish that safety should be first priority in the workshop. Use the projector and signs in the workshop.</p> <p>Educator must practically demonstrate and rectify hazards relating to welding process Carry out pre-operational checks in accordance with manufacturer's specifications.</p> <ul style="list-style-type: none"> Resources to include: manufacturer's operational manual, worksite practices and safety and environmental issues in accordance with standard work site practices <p>Tack weld work-pieces in position as per drawing specifications.</p> <ul style="list-style-type: none"> The right material for the operation The correct procedures and tools for the manufacture of the application G clamps, C clamps, jigs

3 - 4	<p>Welding gas arc process</p> <p>Core welding process</p>	<p>Describe the gas metal arc welding process and related equipment</p> <p>Explain the importance of correct assembly of the gas metal arc welding equipment, and the consequences of incorrect assembly, with reference to the manufacturer's requirements.</p> <p>Describe and demonstrate the cored-wire welding process.</p>	<p>Educator must explain and demonstrate welding parameters in accordance with job requirements.</p> <p><u>Resources to include:</u> manufacturer's specification, worksite practices and safety and environmental issues.</p> <p>Welding parameters: volts/amps, gas-flow, wire speed, and wire stick out as specified in the welding procedures specifications.</p> <p>Explain terms and use definitions consistent with generally accepted welding terminology as recorded in international welding standards;</p> <p>Suitable power source, wire-feeder, shielding gas, regulator, flow-meter, materials as specified on drawings and weld filler material, according to welding procedure specifications.</p> <p>Explain and demonstrate work-pieces prepared prior to welding as specified on drawing and worksite procedures, together with safety aspects.</p> <ul style="list-style-type: none"> • Show learners as per internet pictures what a tack weld looks like <p>Inspect work-piece prior to welding. Check work piece that it is properly tack welded and that the tack weld is strong enough to hold the pieces together.</p>
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			<p>Demonstrate safety precautions. Prepare work-pieces prior to welding.</p> <ul style="list-style-type: none"> • Demonstrate tack weld work-piece in position as per drawing specifications <p>Check dimensions and alignment as specified on drawing</p> <p>Resources include:</p> <ul style="list-style-type: none"> • Worksite procedures, tools, equipment, safety requirements, and materials
5	Calculations	<ul style="list-style-type: none"> • Use mathematics to plan and control projected budgets and income and expenditure • Use a calculator • Book and pen • Use a drawing as reference for costing 	<p>Theoretical explanations of the following should be done by the educator. All calculations using a calculator efficiently and correctly, and solutions obtained are verified in terms of the context.</p> <ul style="list-style-type: none"> • Welding and Mathematics Educators need to integrate specific mathematical problems that will be applicable to learners and their needs. <p>Explain projected income and expenditure realistically.</p> <p>Demonstrate:</p> <ul style="list-style-type: none"> • Material to be used and cost • Drawing to be used • Funds available for project • Cost of making a project

			<ul style="list-style-type: none">• Show the profit made by completing the project.
6-7	Recap all the topics work done for the year	<p>Revision of the following concepts</p> <ul style="list-style-type: none">• Safety• First aid• Tools• Materials• Joining <ul style="list-style-type: none">• Recap and reflecting: this will make sure that learners are properly prepared for joining methods• Drawings• Welding processes	<p>The educator must revise and reflecting, together with all relevant and related materials:</p> <ul style="list-style-type: none">• Wall charts• Notes• Theoretical notes• Power point presentations <p>Recap and reflecting: together with all relevant and related materials, wall charts, notes and power point presentations.</p> <p>Recap and reflecting: together with all relevant and related materials, wall charts, notes and power point presentations</p> <ul style="list-style-type: none">• Welding operations• Gas arc processes• Calculations
8 – 10	Formal Assessment	<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 Demonstration (Measuring, cutting, welding, grinding and drilling) = 25% of the Term mark.</p> <p>The Learners must be able to demonstrate certain skills acquired during the term. This is in the form of a single task and not part of the Terms practical model.</p>			

Learner measures, cuts and prepares two pieces of material as per the drawing. The learner must produce tack welds that should be mechanically strong. A fillet weld should be performed at least 30mm, a hole needs to be drilled and accuracy is really important. All five stages must be assessed.

- Measuring 20% (5)
- Cutting 20% (5)
- Welding 20% (5)
- Drilling 20% (5)
- Grinding 20% (5)

Total for Activity 1 Marks to be converted to 25% of the total term mark.

Activity 2 – PRACTICAL ASSESSMENT TASK – PAT (Practical Project) = 50% of term mark.

Fundamental knowledge = 25%

Practical learning areas = 25%

Learners must now produce a practical project (PAT) using the all the method of construction (in Weeks 1 – 8) which can be assessed to evaluate their acquisition skills. This project should involve the skills, techniques and knowledge of the theory component.

Assessments are done according to a rubric which includes all the skills acquired during the term. Marks total 50% of the term.

- Examples of projects are in the Addendum.

Activity 3 – Formal written or Oral Theory assessment = 25%.

Scope of work that is done during the term.

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1-2	Revision of Safety, first aid HIV and AIDs (OHS Act	<p>Demonstrate understanding of the following</p> <ul style="list-style-type: none"> • Safety procedures • First boxes • Protective clothes • Colours that signs are made out off and their meaning • Safety signs • General safety practices and rules that govern the Welding workshop on a daily basis. <p>Clean and dress a wound</p> <p>Apply the following conditions:</p> <ul style="list-style-type: none"> • Personal safety (PPE – Personal Protective Equipment) • Unsafe acts & conditions • Good house-keeping • General workshop rules • By explaining and showing how a workshop should be kept cleaned on a daily basis. • What unsafe conditions are, the reasons for workshop to be 	<p>Theoretical explanation as well as practical demonstration.</p> <p>Videos and charts to be demonstrated.</p> <p>Worksheets: Oral and Written discussions:</p> <ul style="list-style-type: none"> • In groups / teams • Reference books and charts with suitable content • Practical activity. Role play emergency procedures <p>Show how to clean and dress a wound properly and to register all injuries in a log book</p> <p>Worksheet and Video content on :</p> <ul style="list-style-type: none"> • Safe workshop rules and practices. • First aid charts and videos, show what happens in unsafe work conditions • Introduce the learners to how the workshop is cleaned daily <p>Educator to describe the HIV and Aids protocol:</p> <ul style="list-style-type: none"> • Videos and charts • Oral discussions

		<p>kept safe and clean daily</p> <p>Apply the proper protocol for dealing with victims with HIV and AIDs.</p> <ul style="list-style-type: none"> • Wearing disposable latex medical gloves • Checking yourself for no open wounds • Treating the HIV and AIDs victim with caution • Proper disposal of all cleaning materials 	<ul style="list-style-type: none"> • Worksheets • Present information visually • Seek information from nursing sister
3-4	<p>Equipment:</p> <p>Measuring</p> <p>Hand tools</p>	<p>Explain the following:</p> <ul style="list-style-type: none"> • Identify measuring tools and the proper use thereof • Accurately measure length, width and thickness in mm <p>Select use & care: Hand measuring tools.</p> <ul style="list-style-type: none"> • Tape measure • Steel ruler • Meter stick • Veneer Calliper • 90deg square • Sliding adjustable square • Height gauge with marble top 	<p>Educator with the aid of theory show learners hand tools and how to care and storage of them.</p> <p>Demonstrate the measurement equipment and why it is so important that these tools are taken care of and properly stored away.</p> <ul style="list-style-type: none"> • Demonstrate how to measure and read in mm • Educate how to use the measuring equipment • Demonstrate how important accuracy is • Explain how proper right angles are obtained • Show learners modern technology advancements
5-6	Materials	<p>Explain the following:</p>	<p>Practical demonstration by the educator for the following and the proper tests to be done to show the</p>

		<ul style="list-style-type: none"> Identify: Ferrous & non-ferrous metals (profiles & use) Show the physical difference between the two and the different applications where and why they are used Brass Copper Aluminium Mild steel Stainless Steel Cast iron 	<p>differentiation between non and ferrous metals.</p> <p>The educator must do the following tests and should be demonstrated with the aid of wall charts and internet.</p> <ul style="list-style-type: none"> The magnetic test. (magnet to be used) The spark test. (grinding wheel for specific sparks) Show the different profiles that are used that materials are made in Explain and demonstrate the different types of materials Profiles of the materials The different uses they have in the daily use in industry and in homes and why they needed to be used in all situations
7-8	<p>Welding process</p> <p>Arc Welder</p> <p>Equipment</p>	<p>Describe the shielded metal arc welding process (SMAW).</p> <p>Explain and demonstrate the importance of correct assembly of the shielded metal arc welding equipment, and the consequences of the correct assembly, with reference to the vendor requirements.</p> <p>Select, set up and conduct pre-operational checks of shielded metal arc welding equipment:</p>	<p>Educator should theoretically explain terms and definitions used with welding terminology as recorded in international welding standards.</p> <p>How to repair broken cables and to maintain the equipment.</p> <p>Demonstrate the correct way to connect welding machine.</p> <ul style="list-style-type: none"> The correct polarity connections

		<p>Explain, identify and connect an Arc weld for operation:</p> <ul style="list-style-type: none">• Suitable power source single and 3 phase• Earth clamp• Electrode holder• Welding settings• Welding rod specifications for the appropriate job• Maintenance of cables and helmets• Proper storage of welding equipment and cables <p>Proper care of:</p> <ul style="list-style-type: none">• Welding helmet• Safety glasses• Leather gloves• Leather apron	<ul style="list-style-type: none">• How to insert the welding rod properly in its holder• The right equipment to use before you start to weld <p>Carry out pre-operational checks in accordance with manufacturer's specifications.</p> <p>Resources to include: manufacturer's operational manual, worksite practices and safety</p> <p>Demonstrate verify and selection shielded metal arc welding equipment as specified on welding procedure specification environmental issues.</p> <p>The correct amperage to be used to weld different gauge materials.</p> <p>The correct size welding rods to be used for different types of material.</p> <p>Identify and rectify hazards relating to welding process in accordance with standard work site practices.</p>
9 – 10	Formal Assessment	<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 Demonstration (Measuring, cutting, welding, grinding and drilling) = 25% of the Term mark.</p> <p>The Learners must be able to demonstrate certain skills acquired during the term. This is in the form of a single task and not part of the Terms practical model. A</p>			

certain degree of difficulty needs to increase from term to term and the learner's ability should be taken into consideration.

Learner measures, cuts and prepares two pieces of material as per the drawing. The learner must produce tack welds that should be mechanically strong. A fillet weld should be performed at least 30mm, a hole needs to be drilled and accuracy is really important. All five stages must be assessed.

- Measuring
- Cutting
- Welding
- Drilling
- Grinding

Total for Activity 1 Marks to be converted to 25% of the total term mark.

Activity 2 – PRACTICAL ASSESSMENT TASK – PAT (Practical Project) = 50% of term mark.

Fundamental knowledge = 25%

Practical learning areas = 25%

Learners must now produce a practical project (PAT) using the all the method of construction (in Weeks 1 – 10) which can be assessed to evaluate their acquisition skills. This project should involve the skills, techniques and knowledge of the theory component.

Assessments are done according to a rubric which includes all the skills acquired during the term. Marks total 50% of the term.

- Examples of projects are in the Addendum.

Activity 3 – Formal written or Oral Theory assessment = 25%. Scope of work that is done during the term.

Practical:

Activity 1: Fundamental section 25%. The learners should firstly select all safety equipment before starting assessment. Select and identify all the

tools need to complete the project. Understand from the assessment worksheet what needs to be done to complete the assessment.

Activity 2: Practical Section 50%. Measure and mark the material to be used. Follow the Assessment worksheet to complete the project to be made.

Theory:

Activity 3: Theory section comprises of 25%. This is an oral/ written section whichever the Learner is comfortable with. The answer block section helps the learners to choose the correct answer as well as the correct identification of colour pictures of related equipment.

Year 3 Term 2

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1-2	Revision of Safety, first aid HIV and AIDs (OHS Act	<p>Demonstrate knowledge for the following</p> <ul style="list-style-type: none"> • Safety procedures • First boxes • Protective clothes • Colours that signs are made out off and meaning • Safety signs <p>How to clean and prepare to a wound with the aid of the first aid box which should be present in the workshop.</p> <p>Apply the following conditions:</p> <ul style="list-style-type: none"> • Personal safety (PPE – Personal Protective Equipment) • Unsafe acts & conditions • Good house-keeping • General workshop rules • By explaining and showing how a workshop should be kept cleaned on a daily basis. • What unsafe conditions are, the reasons for workshop to be kept safe and clean daily 	<p>Theoretical explanation as well as practical demonstration.</p> <p>Videos and charts to be demonstrated.</p> <p>Worksheets: Oral and Written discussions:</p> <ul style="list-style-type: none"> • In groups / teams • Reference books and charts with suitable content • Practical activity • Role plays emergency procedures, show how to clean and dress a wound properly and to register all injuries in a log book <p>Worksheet and Video content on :</p> <ul style="list-style-type: none"> • Safe workshop rules and practices • First aid charts and videos show what happens in unsafe work conditions • Introduce the learners to how the workshop is cleaned daily. <p>Educator to demonstrate the HIV and Aids protocol:</p>

		<p>Apply the proper protocol for dealing with victims with HIV and AIDs.</p> <ul style="list-style-type: none"> • Wearing disposable latex medical gloves. • Checking yourself for no open wounds. • Treating the HIV and AIDs victim with caution. • Proper disposal of all cleaning materials. 	<ul style="list-style-type: none"> • Videos and charts • Oral discussions • Worksheets • Present information visually • Seek information from nursing sister.
3-4	Equipment:	<p>Explain the selection, use and care for engineering hand tools and hand power tools.</p> <p>Hand tools examples:</p> <ul style="list-style-type: none"> • Dividers • G clamps • Cole chisel • Various files and uses • Scroll benders • Ball peen hammer • Anvil • Spanners and sockets. • Jigs. • Universal scroll bender • Metal twistors. • Metal shearing. <p>Power hand tools examples:</p>	<p>Educator to theoretical explanation and demonstrations of the topics:</p> <ul style="list-style-type: none"> • The theory can be explained while doing a practical demonstration but pen on paper is important. • Provide the learner with the appropriate note where textbooks are not available. • Attention must be given to correct terminology, safe use and proper care of tools is required. • All topics and content should be covered in theory. <p>Educator to demonstrate the correct way in which power tools need to be stored and also the way electrical cabling needs to be properly rolled up.</p>

		<ul style="list-style-type: none"> • Compressor • Pneumatic hand tools • Hand drill • Finishing grinder • Heat gun • SDS rotary drill. <p>Floor mounted equipment:</p> <ul style="list-style-type: none"> • Folder • Bender • Bench grinder • Guillotine. • Pedestal drill. • 300mm diameter disc sander. <ul style="list-style-type: none"> • Repair and replace a faulty 3 core cable. • Repair and replace a faulty 3 pin plug. • Store and clean hand power tools. 	<p>Educator needs to explain demonstrate the following:</p> <ul style="list-style-type: none"> • Repairs to power cables. • Replacing power cables • Replacing the plug top • Replacing brushes and bearings inside power hand tools and motors.
5-6	Material selection	<p>Explain, Identify and select material to specification.</p> <p>Plan the identification process to identify materials to specification on.</p> <p>Explain and demonstrate the steps in the identification of materials to specification to be in logical sequence and to</p>	<p>Educator to demonstrate all safety precautions in relation to work site practices and procedures.</p> <p>Educator needs to explain and demonstrate the following tests with the aid of wall charts and internet.</p> <ul style="list-style-type: none"> • The magnetic test. (use a magnet) • The spark test. (use a grinding wheel for spark

		<p>job requirements.</p> <p>Identification of materials in accordance with material specification sheet as included in work instructions.</p> <p>Explain the following joints:</p> <ul style="list-style-type: none"> • Butt joint. • Fillet joint (T joint) • Lap joint 	<p>specifics)</p> <p>Identify materials marked with colour code or identification numbers.</p> <ul style="list-style-type: none"> • Materials to be identified is limited to mild steel, aluminium, stainless steel and carbon steels. <p>Identification methods visually with the aid of de-coding systems and mechanical processes.</p> <p>Educator demonstrates and explains with wall charts, video and internet the following joints that are widely used in industry:</p> <ul style="list-style-type: none"> • Butt joint. • Fillet joint (T joint) • Lap joint.
7-8	Drawing and shapes	<p>Measure, estimate and calculate physical quantities and explore, describe and represent geometrical relationships in 2 and 3 dimensions in different life or workplace context</p> <p>Estimate, measure and calculate physical quantities to solve problems in practical situations.</p> <p>Estimate, measure and calculate physical quantities to solve problems in practical situations.</p>	<p>Correctly read scales on the measuring instruments and identify the appropriate instrument to measure a particular quantity. Carry out calculations correctly. Explain and demonstrate appropriate units measurement and calculation.</p> <p>Describe and identify properties of symmetrical shapes. Explain and identify concepts of lines of symmetry in 2- 3 dimensional figures using paper folding and reflections in</p>

		the lines of symmetry. Explain the concepts of transformation in terms of reflections, translations and rotations using concrete materials.
9 – 10	Formal Assessment	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 Demonstration (Measuring, cutting, welding, grinding and drilling) = 25% of the Term mark.</p> <p>The Learners must be able to demonstrate certain skills acquired during the term. This is in the form of a single task and not part of the Terms practical model. A certain degree of difficulty needs to increase from term to term and the learner's ability should be taken into consideration.</p> <p>Learner measures, cuts and prepares two pieces of material as per the drawing. The learner must produce tack welds that should be mechanically strong. A fillet weld should be performed at least 30mm, a hole needs to be drilled and accuracy is really important. All five stages must be assessed.</p> <ul style="list-style-type: none"> • Measuring • Cutting • Welding • Drilling • Grinding <p>Total for Activity 1 Marks to be converted to 25% of the total term mark.</p> <p>Activity 2 – PRACTICAL ASSESSMENT TASK – PAT (Practical Project) = 50% of term mark.</p> <p>Fundamental knowledge = 25%</p> <p>Practical learning areas = 25%</p>		

Learners must now produce a practical project (PAT) using the all the method of construction (in Weeks allocated) which can be assessed to evaluate their acquisition skills. This project should involve the skills, techniques and knowledge of the theory component.

Assessments are done according to a rubric which includes all the skills acquired during the term. Marks total 50% of the term.

- Examples of projects are in the Addendum

Activity 3 – Formal written or Oral Theory assessment = 25%. Scope of work that is done during the term.

Assessment: consists of two sections theory 25% and practical 75% = 100%

Annexure C: Theory Assessment: Oral and /or Written Pages

Theory section: (oral or written) score allocation 25%: comprises of all the above work done in weeks 1 through 8 inclusions should be pictures and multi answer questions. Pictures should constitute a major part of this section.

Annexure D: Practical Assessment: Pages

Practical section: Learners should now be ready to for an assessment with a use of hand tools so that the theoretical aspect can be implemented. Measurement now plays a role as this is the foundation to which all work can commence in the workshop.

At the end of this term; A project should be completed as evidence of the learner's ability.

(NB! Not all learners will be able to produce an exact reproduction of the example the educator has provided).

Year 3 Term 3

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1	Re-cap Safety and procedures	<p>Demonstrate understanding of all safety and First Aid, HIV and AIDS procedures.</p> <p>Explain and demonstrate how to clean and dress a wound properly.</p> <p>Explain demonstrate the different procedures aligned with evacuating the workshop in an emergency situation.</p>	<p>Explain all safety, first aid and HIV and AIDS procedures, learners need to be shown all the signs and pictures to establish that safety should be first priority in the workshop.</p> <p>First aid procedures:</p> <ul style="list-style-type: none"> • Educator to protect himself with gloves and apparel for HIV and Aids injury victims • Examine the injury • How to clean a wound • Proper wound dressing • Reporting and written procedures when an injury has occurred <p>Emergency procedures:</p> <ul style="list-style-type: none"> • Demonstrate a fire drill • Emergency drill • Power outage
2-4	Arc Welding process	Describe the shielded metal arc welding process.	The Educator must explain and demonstrate the importance of correct assembly of the shielded

		<p>Weld carbon steel work-pieces using the shielded metal arc welding process</p> <p>Select, set up and conduct pre-operational checks of shielded metal arc welding equipment.</p> <p>Prepare work-pieces prior to welding. Weld work-pieces. Inspect welded work piece for defects in compliance with drawing specifications.</p> <p>Care for and store welding consumables and equipment.</p>	<p>metal arc welding equipment:</p> <ul style="list-style-type: none"> • The consequences of incorrect assembly, with reference to the vendor requirements. Identify and explain • Basic and major components in terms of manufacturer's requirements and standards • Manufacturer's operational manual • Worksite practices and safety and environmental issues • Inspect work-pieces prior to welding • Worksite procedures, tools, equipment, safety requirements, and materials
5-6	Oxy-fuel gas cutting	<p>Describe the oxy-fuel cutting process including correct ignition sequence and shutting down procedure. Prepare for the oxy-fuel cutting operation. Cut material. Care and storage of cutting equipment, tools, and materials.</p> <p>Identify and explain basic and major components of the oxy-fuel cutting process and equipment, function and purpose is correct in terms of cutting standards. Care and storage of cutting equipment, tools, and materials</p>	<p>Explain the oxy-fuel process including correct ignition sequence and shutting down procedure.</p> <p>Explain and demonstrate the importance of correct setting of cutting pressures, and the consequences of incorrect settings.</p> <p>Cutting of material is carried out in accordance with work instruction sheet and drawing requirements.</p> <p>Inspect end product to conform to specifications as reflected on drawing or job requirement. Defects</p>

			<p>include excessive slag, rough cutting surface, jagged edges, rounded top corner.</p> <ul style="list-style-type: none"> • Hazards include flashbacks • Identify and correct cutting defects • Material type to be used: May be selected from the range of carbon steels (plate only), applicable to the material groups 1, 2, 3 or 11 [according to ISO (TR) 15608] • Material thickness: minimum – 10 mm • Positions: All positions/directions • Explain the caring and storage procedures for tools, equipment in accordance with work site practices and specifications
7-8	<p>Welding process</p> <p>(Arc welder)</p>	<p>Describe the gas metal arc welding process and related equipment.</p> <p>Describe the Weld carbon steel work pieces using the gas metal arc welding process in the down-hand position.</p> <p>Describe the selection, assemble and conduct pre-operational checks of gas metal arc welding equipment.</p> <p>Describe the preparation work-pieces prior to welding and</p>	<p>Explain the importance of correct assembly of the gas metal arc welding equipment, and the consequences of incorrect assembly, with reference to the manufacturer's requirements.</p> <p>Explain terms and use definitions consistent with generally accepted welding terminology as recorded in international welding standards;</p> <p>Suitable power source, wire-feeder, shielding gas, regulator, flow-meter, materials as specified on</p>

		<p>Weld work-pieces.</p> <p>Describe and inspect welded work-pieces for defects.</p> <p>Describe the care for and store welding consumables and equipment.</p>	<p>drawings and weld filler material, according to welding procedure specifications. Inspect work-pieces prior to welding.</p> <p>Resources include the following:</p> <ul style="list-style-type: none"> • Worksite practices, tools and equipment. • Safety legislation as per job requirements • Inspection methods - Visual, destructive or non-destructive <p>Observations applicable prior to the tack-welding process:</p> <ul style="list-style-type: none"> • Heat input • Electrode size • Filler-rod material selection • Joint preparation • Welding technique • Consumable usage • Handling and gas shielding <p>Demonstrate work-pieces welded in position.</p> <p>Demonstrate storage of welding consumables in accordance to worksite practices; tools and equipment stored to conform to worksite practices.</p>
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9 – 10	Formal Assessment	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.
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Activity 1- Practical Demonstration (Measuring, cutting, welding, grinding and drilling) = 25% of the Term mark.

The Learners must be able to demonstrate certain skills acquired during the term. This is in the form of a single task and not part of the Terms practical model. A certain degree of difficulty needs to increase from term to term and the learner's ability should be taken into consideration.

Learner measures, cuts and prepares two pieces of material as per the drawing. The learner must produce tack welds that should be mechanically strong. A fillet weld should be performed at least 30mm, a hole needs to be drilled and accuracy is really important. All five stages must be assessed.

- Measuring
- Cutting
- Welding
- Drilling
- Grinding

Total for Activity 1 Marks to be converted to 25% of the total term mark.

Activity 2 – PRACTICAL ASSESSMENT TASK – PAT (Practical Project) = 50% of term mark.

Fundamental knowledge = 25%

Practical learning areas = 25%

Learners must now produce a practical project (PAT) using the all the method of construction (in Weeks allocated) which can be assessed to evaluate their acquisition skills. This project should involve the skills, techniques and knowledge of the theory component.

Assessments are done according to a rubric which includes all the skills acquired during the term. Marks total 50% of the term.

- Examples of projects are in the Addendum.

Activity 3 – Formal written or Oral Theory assessment = 25%. Scope of work that is done during the term.

Assessment: consists of two sections theory 25% and practical 75% = 100%

Annexure C: Theory Assessment: Oral and /or Written Pages

Theory section: (oral or written) score allocation 25%: comprises of all the above work done in weeks 1 through 10 inclusions should be pictures and multi answer questions. Pictures should constitute a major part of this section.

Annexure D: Practical Assessment: Pages.....

Practical section: Learners should now be ready to for an assessment with a use of hand tools so that the theoretical aspect can be implemented. Measurement now plays a role as this is the foundation to which all work can commence in the workshop.

At the end of this term: A project should be completed as evidence of the learner's ability.

(NB! Not all learners will be able to produce an exact reproduction of the example the educator has provided).

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1	Re-cap Safety and procedures	<p>Demonstrate understanding of all safety and First Aid, HIV and AIDS procedures.</p> <p>Explain and demonstrate how to clean and dress a wound properly.</p> <p>Explain and demonstrate the different procedures aligned with evacuating the workshop in an emergency situation.</p>	<p>Explain all safety, first aid and HIV and AIDS procedures, learners need to be shown all the signs and pictures to establish that safety should be first priority in the workshop.</p> <p>First aid procedures:</p> <ul style="list-style-type: none"> • Educator to protect himself with gloves and apparel for HIV and Aids injury victims • Examine the injury • How to clean a wound • Proper wound dressing • Reporting and written procedures when an injury has occurred <p>Emergency procedures:</p> <ul style="list-style-type: none"> • Demonstrate a fire drill • Emergency drill • Power outage/ failure

2-3	Core Welding Process	<p>Describe the cored-wire welding process.</p> <p>Select, set up and conduct pre-operational checks of cored-wire welding equipment.</p> <p>Prepare work-pieces prior to welding and weld work-pieces.</p> <p>Inspect welded work-pieces for defects.</p> <p>Care for and store welding consumables and equipment.</p>	<p>Educator must explain and demonstrate the importance of correct assembly of the cored-wire welding equipment, and the consequences of incorrect assembly, with reference to the vendor requirements.</p> <p>Educator must explain and demonstrate basic and major components of the cored-wire welding equipment in terms of manufacturer's requirements and standards.</p> <p>Educator must identify and explain parts and components used for the cored-wire welding process.</p> <p>Educator must explain terms and definitions used are consistent with generally accepted welding terminology as recorded in international welding standards.</p> <p>With explanation and demonstration of Welding equipment includes:</p> <p>Constant voltage power source, earth clamp, welding cable, shielding gas, flow meter regulator, hose clamps and welding consumables as specified.</p> <p>Demonstrate storage of welding consumables in</p>
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			accordance to worksite practices; tools and equipment stored to conform to worksite practices.
4	Language and communication Financial and mathematics solutions	<p>Explain sector identification and organisation type:</p> <ul style="list-style-type: none"> • Sector/occupational focus: Services, manufacturing, financial, educational etc. • Organisation type: Government, parastatal, heavy/light industry, large organisation, small business <p>Explain projected income and expenditure realistically.</p> <p>Demonstrate and define initial cost before work has started and profit that can be achieved when a product is completed.</p>	<p>Educator must describe and discuss features of occupational environment</p> <p>Description and discussion by the educator in which these features affect learning processes and/or application of learning</p> <p>Educator must carry out calculations using a calculator efficiently and correctly, and solutions obtained are verified in terms of the context.</p> <ul style="list-style-type: none"> • Initial cost • Expenditure on products • Profit to be made

5-7	Recap all the topics and work done for the year	Recap and reflecting, this will make sure that learners are properly prepared for Theory and Practical assessments:	<p>Revise and reflecting, together with all relevant and related materials, wall charts, notes and power point presentations</p> <ul style="list-style-type: none"> • Safety and first aid • Tools • Materials and joining • Welding Equipment <p>Recap and reflecting: together with all relevant and related materials, wall charts, notes and power point presentations.</p> <ul style="list-style-type: none"> • Workshop Practices • Material Selections • Drawings and Shapes <p>Recap and reflecting: together with all relevant and related materials, wall charts, notes and power point presentations</p> <ul style="list-style-type: none"> • Gas Arc Welding operations and processes • Oxy and acetylene cutting and welding • Cored-wire welding process. • Calculations • Language and communications • Mathematics and financial solutions
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8 – 10	Formal Assessment	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.
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Activity 1- Practical Demonstration (Measuring, cutting, welding, grinding and drilling) = 25% of the Term mark.

The Learners must be able to demonstrate certain skills acquired during the term. This is in the form of a single task and not part of the Terms practical model. A certain degree of difficulty needs to increase from term to term and the learner's ability should be taken into consideration.

Learner measures, cuts and prepares two pieces of material as per the drawing. The learner must produce tack welds that should be mechanically strong. A fillet weld should be performed at least 30mm, a hole needs to be drilled and accuracy is really important. All five stages must be assessed.

- Measuring
- Cutting
- Welding
- Drilling
- Grinding

Total for Activity 1 Marks to be converted to 25% of the total term mark.

Activity 2 – PRACTICAL ASSESSMENT TASK – PAT (Practical Project) = 50% of term mark.

Fundamental knowledge = 25%

Practical learning areas = 25%

Learners must now produce a practical project (PAT) using the all the method of construction (in Weeks 1 – 8) which can be assessed to evaluate their acquisition skills. This project should involve the skills, techniques and knowledge of the theory component.

Assessments are done according to a rubric which includes all the skills acquired during the term. Marks total 50% of the term.

- Examples of projects are in the Addendum

Activity 3 – Formal written or Oral Theory assessment = 25%. Scope of work that is done during the term.

Assessment: consists of two sections theory 25% and practical 75% = 100%

Annexure C: Theory Assessment: Oral and /or Written Pages

Theory section: (oral or written) score allocation 25%: comprises of all the above work done in weeks 1 through 8 inclusions should be pictures and multi answer questions. Pictures should constitute a major part of this section.

Annexure D: Practical Assessment: Pages

Practical section: Learners should now be ready to for an assessment with a use of hand tools so that the theoretical aspect can be implemented. Measurement now plays a role as this is the foundation to which all work can commence in the workshop.

At the end of this term: A project should be completed as evidence of the learner's ability.

(NB! Not all learners will be able to produce an exact reproduction of the example the educator has provided).

Year 4 Term 1

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1-2	Introduction: (orientation) Safety & first aid	<p>Demonstrate understanding of the following:</p> <ul style="list-style-type: none"> • Safety procedures • First boxes • Protective clothes • Colours that signs are made out off and meaning • Safety signs • Sand buckets • Fire hoses <p>Apply how to clean and dress a wound</p> <p>Apply the following conditions:</p> <ul style="list-style-type: none"> • Personal safety (PPE – Personal Protective Equipment) • Unsafe acts & conditions • Good house-keeping • General workshop rules • By explaining and showing how a workshop should be kept cleaned on a daily basis. • What are unsafe conditions, the reasons for workshop to be 	<p>Theoretical explanation as well as practical demonstration.</p> <p>Videos and charts to be demonstrated.</p> <p>Worksheets: Oral and Written discussions:</p> <ul style="list-style-type: none"> • In groups / teams • Reference books and charts with suitable content • Practical activity. Role plays emergency procedures • Practical activity. The use of sand buckets and fire hoses <p>Show how to clean and dress a wound properly and to register all injuries in a log book</p> <p>Worksheet and Video content on :</p> <ul style="list-style-type: none"> • Safe workshop rules and practices • First aid charts and videos show what happens in unsafe work conditions • Introduce the learners to how the workshop is cleaned daily • The safe storage and care of all tools and

		<p>kept safe and clean daily</p> <p>Learners need to apply the proper protocol for dealing with victims with HIV and AIDs.</p> <ul style="list-style-type: none"> • Wearing gloves • Checking yourself for no open wounds • Treating the HIV and AIDs victim with caution • Proper disposal of all cleaning materials 	<p>equipment when learners are finish using the tools.</p> <p>Educator to demonstrate the HIV and Aids protocol:</p> <ul style="list-style-type: none"> • Videos and charts • Oral discussions • Worksheets • Present information visually • Seek information from nursing sister
3-4	Tools	<p>Explain the following:</p> <ul style="list-style-type: none"> • Identify measuring tools and the proper use thereof • Accurately measure length • Width • Thickness in mm <p>Select use & care: Hand measuring tools.</p> <ul style="list-style-type: none"> • Tape measure • Steel ruler • Meter stick • Veneer Calliper • Dividers callipers • Combination square set • Sliding adjustable square • Height gauge with marble top 	<p>Educator with the aid of theory show learners hand tools and how to care and storage of them.</p> <p>Demonstrate the measurement equipment and why it is so important that these tools are taken care of and properly stored away.</p> <ul style="list-style-type: none"> • Demonstrate how to measure and read in mm. • Educate how to use the measuring equipment. • Demonstrate how important accuracy is • Explain how proper right angles are obtained. • Show learners modern technology advancements • How to mitre joints (45deg) properly

5-6	Materials	<p>Explain and demonstrate understanding of the following:</p> <ul style="list-style-type: none"> • Ferrous & non- ferrous metals (profiles & use) • Show the physical difference between the two and the different applications where and why they are used • Brass • Bronze • Hardened Steel • Copper • Aluminium • Mild steel • Stainless Steel • Cast iron • Galvanised Steel 	<p>Practical demonstration by the educator for the following and the proper tests to be done to show the differentiation between non and ferrous metals.</p> <p>The following tests should be demonstrated and shown with the aid of wall charts and internet.</p> <ul style="list-style-type: none"> • The magnetic test. The use of a magnet and checking that the magnet sticks to the material • The spark test. With the use of a grinding wheel the spark composition can be determined • Show the different profiles that are used that materials are made in • Explain and demonstrate the different types of materials • Profiles of the materials • The different uses they have in the daily use in industry and in homes and why they needed to be used in all situations
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7-8	Welding equipment.	<p>Describe the shielded metal arc welding process (SMAW).</p> <p>Explain and demonstrate the importance of correct assembly of the shielded metal arc welding equipment, and the consequences of incorrect assembly, with reference to the vendor requirements.</p> <p>Select, set up and conduct pre-operational checks of shielded metal arc welding equipment:</p> <p>Explain identify and connect an Arc weld for operation:</p> <ul style="list-style-type: none"> • Suitable power source single and 3 phase • Earth clamp • Electrode holder • Welding settings • Welding rod specifications for the appropriate job • Maintenance of cables and helmets • Proper storage of welding equipment and cables • Proper ventilation when welding galvanised materials <p>Proper care of:</p> <ul style="list-style-type: none"> • Welding helmet • Replacement of welding helmet glasses (green & clear) • Safety glasses • Leather gloves 	<p>Educator should theoretically explain terms and definitions used with welding terminology as recorded in international welding standards.</p> <p>How to repair broken cables and to maintain the equipment.</p> <ul style="list-style-type: none"> • Demonstrate the correct way to connect welding machine • The correct polarity connections • How to insert the welding rod properly in its holder • The right equipment to use before you start to weld <p>Carry out pre-operational checks in accordance with manufacturer's specifications.</p> <p>Resources to include: manufacturer's operational manual, worksite practices and safety.</p> <p>Demonstrate verify and selection shielded metal arc welding equipment as specified on welding procedure specification environmental issues.</p> <p>Educator must explain and demonstrate how to replace the broken welding helmet glasses (green and clear) also the proper way to adjust the head cradle</p>
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		<ul style="list-style-type: none">Leather apron	<p>adjustments.</p> <p>The correct amperage to be used to weld different gauge materials.</p> <p>The correct welding rods size to be used for different types of material.</p> <p>Identify and rectify hazards relating to welding process in accordance with standard work site practices.</p> <p>Educator must explain and demonstrate the correct procedures to be taken when welding galvanised materials.</p> <ul style="list-style-type: none">Proper ventilation for the extraction of gases when welding galvanised materialsWelding splatter when welding galvanised materialsThe correct preparation of materials before welding galvanised materials
9 – 10	Formal Assessment	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 Demonstration (Measuring, cutting, welding, grinding and drilling) = 25% of the Term mark.

The Learners must be able to demonstrate certain skills acquired during the term. This is in the form of a single task and not part of the Terms practical model. A

certain degree of difficulty needs to increase from term to term and the learner's ability should be taken into consideration.

Learner measures, cuts and prepares two pieces of material as per the drawing. The learner must produce tack welds that should be mechanically strong. A fillet weld or should be performed at least 30mm, a hole needs to be drilled and accuracy is really important. All five stages must be assessed.

- Measuring
- Cutting
- Welding
- Drilling
- Grinding

Total for Activity 1 Marks to be converted to 25% of the total term mark.

Activity 2 – PRACTICAL ASSESSMENT TASK – PAT (Practical Project) = 50% of term mark.

Fundamental knowledge = 25%

Practical learning areas = 25%

Learners must now produce a practical project (PAT) using the all the method of construction (in Weeks 1 – 8) which can be assessed to evaluate their acquisition skills. This project should involve the skills, techniques and knowledge of the theory component.

Assessments are done according to a rubric which includes all the skills acquired during the term. Marks total 50% of the term.

- Examples of projects are in the Addendum.

Activity 3 – Formal written or Oral Theory assessment = 25%.

Scope of work that is done during the term.

Practical:

Activity 1: Fundamental section 25%. The learners should firstly select all safety equipment before starting assessment. Select and identify all the tools need to complete the project. Understand from the assessment worksheet what needs to be done to complete the assessment.

Activity 2: Practical Section 50%. Measure and mark the material to be used. Follow the Assessment worksheet to complete the project to be made.

Theory:

Activity 3: Theory section comprises of 25%. This is an oral/ written section whichever the Learner is comfortable with. The answer block section helps the learners to choose the correct answer as well as the correct identification of colour pictures of related equipment

Year 4 Term 2

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1-2	Re-cap Safety and procedures	<p>Demonstrate understanding of the following:</p> <ul style="list-style-type: none"> • Safety procedures • Main reason for having a First aid boxes and the positions of the first aid box. • The main function of protective clothing and their safety features of. • Colours that signs are made out off and meaning. • Safety signs and reasons for being situated in the right places. <p>Explain how to clean and dress a wound</p> <p>Apply the following conditions:</p> <ul style="list-style-type: none"> • Personal safety (PPE – Personal Protective Equipment) • Unsafe acts & conditions • Good house-keeping • General workshop rules and practices • By explaining and showing how a workshop should be kept cleaned on a daily basis. • What unsafe conditions are, the reasons for workshop to 	<p>Theoretical explanation as well as practical demonstration.</p> <p>Videos and charts to be demonstrated.</p> <p>Worksheets: Oral and Written discussions:</p> <ul style="list-style-type: none"> • In groups / teams while educator gives the proper explanations. • Reference books and charts with suitable content. • Practical activity. Role plays emergency procedures. • The correct colour coding of all relative signs that are used in the workshop. <p>Show how to clean and dress a wound properly and to register all injuries in a log book.</p> <p>Worksheet and Video content on :</p> <ul style="list-style-type: none"> • Safe workshop rules and practices • First aid charts and videos show what happens in unsafe work conditions • Introduce the learners to how the workshop is cleaned daily

		<p>be kept safe and clean daily</p> <ul style="list-style-type: none"> • Safe evacuation procedures in the case of fire and emergencies <p>Explain the proper protocol for dealing with victims with HIV and AIDs.</p> <ul style="list-style-type: none"> • Wearing disposable latex medical gloves • Checking yourself for no open wounds • Treating the HIV and AIDs victim with caution • Proper disposal of all cleaning materials 	<ul style="list-style-type: none"> • Safe evacuation of the workshop • The correct fire drill and evacuation procedure when a fire and/or emergency happens. <p>Educator to demonstrate and discuss the HIV and Aids protocol:</p> <ul style="list-style-type: none"> • Videos and charts • Oral discussions • Worksheets • Present information visually • Seek information from nursing sister
3-4	Apply work site practices.	<p>Explain the selection, use and care for engineering hand tools and hand power tools.</p> <p>Hand tools examples:</p> <ul style="list-style-type: none"> • Dividers • G clamps • Cole chisel • Various files and uses • Scroll benders • Ball peen hammer • Anvil • Bench vice • Spanners and sockets 	<p>Theoretical explanation and demonstrations of the topics:</p> <ul style="list-style-type: none"> • The theory can be explained while doing a practical demonstration but pen on paper is important • Provide the learner with the appropriate note where textbooks are not available • Attention must be given to correct terminology, safe use and proper care of tools is required • All topics and content should be covered in theory <p>Demonstrate the correct way in which power tools need</p>

		<p>Power hand tools examples:</p> <ul style="list-style-type: none"> • Compressor • Pneumatic hand tools • Hand drill • Angle grinders 250/350 mm • Finishing grinder • Jig saw • SDS rotary drill <p>Floor mounted equipment:</p> <ul style="list-style-type: none"> • Folder • Bender • Bench grinder • Guillotine • Pedestal drill • 300 mm diameter disc sander <p>Explain how the following:</p> <ul style="list-style-type: none"> • Repair and replace a faulty 3 core cable. • Repair and replace a faulty 3 pin plug • Store and clean hand power tools 	<p>to be stored and also the way electrical cabling needs to be properly rolled up.</p> <p>Educator needs to explain demonstrate the following:</p> <ul style="list-style-type: none"> • Repairs to power cables • Replacing power cables • Replacing the plug top • Replacing brushes and bearings inside power hand tools and motors • Proper storage and care of all tools located in the lockable area
5-6	Material selection	<p>Explain, identify and select material to specification.</p> <p>Plan the identification process to identify materials to specification on.</p>	<p>Demonstrate all safety precautions in relation to work site practices and procedures.</p> <p>Educator needs to explain and demonstrate the following</p>

		<p>Demonstrate the steps in the identification of materials to specification to be in logical sequence and to job requirements.</p> <p>The correct application for the following materials:</p> <ul style="list-style-type: none"> • Galvanised materials • Mild steel • Stainless Steel • Aluminium • Carbon steel • Brass and copper <p>Identify materials in accordance with material specification sheet as included in work instructions.</p>	<p>tests with the aid of wall charts and internet.</p> <ul style="list-style-type: none"> • The magnetic test. The use of a magnet and checking that the magnet sticks to the material • The spark test. With the use of a grinding wheel the spark composition can be determined <p>Identify materials marked with colour code or identification numbers.</p> <ul style="list-style-type: none"> • Materials to be identified are limited to • Mild steel • Galvanised steel • Aluminium • Stainless steel • Carbon steels • Brass and copper <p>Identification methods visually with the aid of de-coding systems and mechanical processes</p>
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7-8	Drawing and shapes	<p>Measure, estimate and calculate physical quantities and explore, describe and represent geometrical relationships in 2-dimensions in different life or workplace context</p> <ul style="list-style-type: none">• Estimate• Measure• Calculate physical quantities• To solve problems in theoretical situations• To solve problems in practical I situations	<p>Correctly read scales on the measuring instruments and identify the appropriate instrument to measure a particular quantity. Carry out calculations correctly. Explain and demonstrate appropriate units measurement and calculation.</p> <p>Describe and identify properties of symmetrical shapes.</p> <p>Explain and identify concepts of lines of symmetry in 2-dimensional figures using paper folding and reflections in the lines of symmetry. Explain the concepts of transformation in terms of reflections, translations and rotations using concrete materials.</p>
9 – 10	Formal Assessment	<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>	

Activity 1- Practical Demonstration (Measuring, cutting, welding, grinding and drilling) = 25% of the Term mark.

The Learners must be able to demonstrate certain skills acquired during the term. This is in the form of a single task and not part of the Terms practical model. A certain degree of difficulty needs to increase from term to term and the learner’s ability should be taken into consideration.

Learner measures, cuts and prepares two pieces of material as per the drawing. The learner must produce tack welds that should be mechanically strong. A fillet weld should be performed at least 30 mm, a hole needs to be drilled and accuracy is really important. All five stages must be assessed.

- Measuring

- Cutting
- Welding
- Drilling
- Grinding

Total for Activity 1 Marks to be converted to 25% of the total term mark.

Activity 2 – PRACTICAL ASSESSMENT TASK – PAT (Practical Project) = 50% of term mark.

Fundamental knowledge = 25%

Practical learning areas = 25%

Learners must now produce a practical project (PAT) using the all the method of construction (in Weeks 1 – 8) which can be assessed to evaluate their acquisition skills. This project should involve the skills, techniques and knowledge of the theory component.

Assessments are done according to a rubric which includes all the skills acquired during the term. Marks total 50% of the term.

- Examples of projects are in the Addendum.

Activity 3 – Formal written or Oral Theory assessment = 25%.

Scope of work that is done during the term.

Practical:

Activity 1: Fundamental section 25%. The learners should firstly select all safety equipment before starting assessment. Select and identify all the tools need to complete the project. Understand from the assessment worksheet what needs to be done to complete the assessment.

Activity 2: Practical Section 50%. Measure and mark the material to be used. Follow the Assessment worksheet to complete the project to be made.

Theory:

Activity 3: Theory section comprises of 25%. This is an oral/ written section whichever the Learner is comfortable with. The answer block section helps the learners to choose the correct answer as well as the correct identification of colour pictures of related equipment.

PUBLIC COMMENT

Year 4 Term 3

WEEK	TOPIC	CONTENT The learner is able to:	Techniques, activities, resources and process notes
1	Re-cap Safety and procedures	<p>Demonstrate understanding of all safety and First Aid, HIV and AIDS procedures.</p> <p>Explain and demonstrate how to clean and dress a wound properly.</p> <p>Explain and demonstrate the different procedures aligned with evacuating the workshop in an emergency situation.</p>	<p>Explain all safety, first aid and HIV and AIDS procedures, learners need to be shown all the signs and pictures to establish that safety should be first priority in the workshop.</p> <p>First aid procedures:</p> <ul style="list-style-type: none"> • Educator to protect himself with gloves and apparel for HIV and Aids injury victims • Examine the injury • How to clean a wound • Proper wound dressing • Reporting and written procedures when an injury has occurred <p>Emergency procedures:</p> <ul style="list-style-type: none"> • Demonstrate a fire drill • Emergency drill • Power outage

2-4	Arc Welding process	<p>Description by learners of the shielded metal arc welding process (SMAW).</p> <p>Weld carbon steel work-pieces using the shielded metal arc welding process</p> <p>Select, set up and conduct pre-operational checks of shielded metal arc welding equipment.</p> <p>Prepare work-pieces prior to welding. Weld work-pieces. Inspect welded work piece for defects in compliance with drawing specifications.</p> <p>Demonstrate and explain the correct care and storage of the following welding items:</p> <ul style="list-style-type: none"> • The correct storage of all welding rods in different sizes. • The welding machines in correctly demarcated section, including the electrical cables neatly tied up. • The welding cables properly hung away in pairs. • The proper storage, cleaning and replacement of the two lenses that are used in a welding helmet. 	<p>Explain and demonstrate the importance of correct assembly of the shielded metal arc welding equipment, and the consequences of incorrect assembly, with reference to the vendor requirements.</p> <p>Identify and explain basic and major components of the shielded metal arc welding equipment in terms of manufacturer's requirements and standards.</p> <p>Resources to include:</p> <ul style="list-style-type: none"> • Manufacturer's operational manual • Worksite practices and safety and environmental issues Inspect work-pieces prior to welding • Worksite procedures, tools, equipment, safety requirements, and materials • Proper care of the storage and care of all welding items that are used on a daily basis.
5-6	Oxy-fuel gas cutting	Describe the oxy-fuel cutting process.	The educator must explain and demonstrate the following:

		<p>Prepare for the oxy-fuel cutting operation.</p> <ul style="list-style-type: none"> • Cut material • Care and storage of cutting equipment, tools, and materials <p>Identify and explain basic and major components of the oxy-fuel cutting process and equipment, function and purpose is correct in terms of cutting standards.</p> <p>Care and storage of cutting equipment, tools, and materials</p>	<ul style="list-style-type: none"> • Importance of correct setting of cutting pressures, and the consequences of incorrect settings • Cutting of material is carried out in accordance with work instruction sheet and drawing requirements • Inspect end product to conform to specifications as reflected on drawing or job requirement • Defects include excessive slag, • Rough cutting surface • Jagged edges, rounded top corner • Hazards include flashbacks • Identify and correct cutting defects <p>Material type to be used: May be selected from the range of carbon steels (plate only), applicable to the material groups 1, 2, 3 or 11 [according to ISO (TR) 15608].</p> <ul style="list-style-type: none"> • Material thickness: minimum – 10 mm • Positions: All positions/directions • Explain the caring and storage procedures for tools, equipment in accordance with work site practices and specifications
7-8	Welding process (Arc welder)	<p>Describe the gas metal arc welding process and related equipment.</p> <p>Weld carbon steel work pieces using the gas metal arc</p>	<p>Explanation by the educator demonstrating the importance of correct assembly of the gas metal arc welding equipment:</p>

		<p>welding process in the down-hand position</p> <p>Select, assemble and conduct pre-operational checks of gas metal arc welding equipment.</p> <p>Prepare work-pieces prior to welding and Weld work-pieces. Inspect welded work-pieces for defects.</p> <p>Explain the process of how to care for and store welding consumables and equipment.</p> <p>The following welding defects and their causes need to be identified and explained after a welding process (arc welding) is done.</p> <ul style="list-style-type: none"> • Porosity • Incomplete or poor penetration • Slag inclusions • Under cutting 	<ul style="list-style-type: none"> • The consequences of incorrect assembly, with reference to the manufacturer's requirements <p>Explain terms and use definitions consistent with generally accepted welding terminology as recorded in international welding standards:</p> <ul style="list-style-type: none"> • Suitable power source • Wire-feeder • Shielding gas • Regulator • Flow-meter • Materials as specified on drawings • Weld filler material, according to welding procedure specifications. Inspect work-pieces prior to welding <p>Resources include for the educators explanation and demonstration of the following:</p> <ul style="list-style-type: none"> • Worksite practices • Tools and equipment • Safety legislation as per job requirements • Inspection methods - Visual, destructive or non-destructive • Porosity, Incomplete or poor penetration, Slag
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			<p>inclusions and under cutting.</p> <p>Observations applicable prior to the tack-welding process:</p> <p>Heat input, electrode size, filler-rod material selection, joint preparation, welding technique, consumable usage, handling and gas shielding.</p> <p>Demonstrate work-pieces welded in position.</p> <p>Demonstrate storage of welding consumables in accordance to worksite practices; tools and equipment stored to conform to worksite practices.</p>
9 – 10	Formal Assessment	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 Demonstration (Measuring, cutting, welding, grinding and drilling) = 25% of the Term mark.</p> <p>The Learners must be able to demonstrate certain skills acquired during the term. This is in the form of a single task and not part of the Terms practical model. A certain degree of difficulty needs to increase from term to term and the learner’s ability should be taken into consideration.</p> <p>Learner measures, cuts and prepares two pieces of material as per the drawing. The learner must produce tack welds that should be mechanically strong. A fillet weld should be performed at least 30mm, a hole needs to be drilled and accuracy is really important. All five stages must be assessed.</p> <ul style="list-style-type: none">• Measuring• Cutting• Welding• Drilling			

- Grinding

Total for Activity 1 Marks to be converted to 25% of the total term mark.

Activity 2 – PRACTICAL ASSESSMENT TASK – PAT (Practical Project) = 50% of term mark.

Fundamental knowledge = 25%

Practical learning areas = 25%

Learners must now produce a practical project (PAT) using the all the method of construction (in Weeks allocated) which can be assessed to evaluate their acquisition skills. This project should involve the skills, techniques and knowledge of the theory component.

Assessments are done according to a rubric which includes all the skills acquired during the term. Marks total 50% of the term.

- Examples of projects are in the Addendum.

Activity 3 – Formal written or Oral Theory assessment = 25%.

Scope of work that is done during the term.

Practical:

Activity 1: Fundamental section 25%. The learners should firstly select all safety equipment before starting assessment. Select and identify all the tools need to complete the project. Understand from the assessment worksheet what needs to be done to complete the assessment.

Activity 2: Practical Section 50%. Measure and mark the material to be used. Follow the Assessment worksheet to complete the project to be made.

Theory:

Activity 3: Theory section comprises of 25%. This is an oral/ written section whichever the Learner is comfortable with. The answer block section helps the learners to choose the correct answer as well as the correct identification of colour pictures of related equipment.

Year 4 Term 4

WEEK	TOPIC	CONTENT	Techniques, activities, resources and process notes
		Revision and consolidation	
1	Re-cap Safety and procedures	<p>Insure that learners are properly updated with all safety and First Aid, HIV and AIDS procedures.</p> <p>Demonstrate how to clean and dress a wound properly.</p> <p>Demonstrate the different procedures aligned with evacuating the workshop in an emergency situation.</p>	<p>Explain all safety, first aid and HIV and AIDS procedures, learners need to be shown all the signs and pictures to establish that safety should be first priority in the workshop.</p> <p>First aid procedures:</p> <ul style="list-style-type: none"> • Educator to protect himself with gloves and apparel for HIV and Aids injury victims • Examine the injury • How to clean a wound • Proper wound dressing • Reporting and written procedures when an injury has occurred <p>Emergency procedures:</p> <ul style="list-style-type: none"> • Demonstrate a fire drill • Emergency drill • Power outage/ failure
2-3	Core	Describe the cored-wire welding process.	Educator needs to explain and demonstrate the importance of correct assembly of the cored-wire welding

	<p>Welding Process</p>	<p>Select, set up and conduct pre-operational checks of cored-wire welding equipment.</p> <p>Prepare work-pieces prior to welding and weld work-pieces.</p> <p>Inspect welded work-pieces for defects.</p> <p>Explain the process of how to care for and store welding consumables and equipment.</p>	<p>equipment:</p> <ul style="list-style-type: none"> • The consequences of incorrect assembly • Reference to the vendor requirements • Explain and demonstrate basic and major components • The manufacturer's requirements and standards • Identify and explain parts and components • The definitions used are consistent with generally accepted welding terminology as recorded in international welding standards <p>Educator needs to explain and demonstrate the Welding equipment includes:</p> <ul style="list-style-type: none"> • Constant voltage power source • Earth clamp and welding cables • Shielding gas • Flow meter regulator • Hose clamps and welding consumables as specified <p>Demonstrate storage of welding consumables in accordance to worksite practices; tools and equipment stored to conform to worksite practices.</p>
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4	Language and communication Financial and mathematics solutions	<p>Sector identification and organisation type:</p> <ul style="list-style-type: none"> Sector/occupational focus: Services, manufacturing, financial, educational etc. <p>Organisation type: Government, parastatal, heavy/light industry, large organisation, small business</p> <p>Explain income that can be made from completing work timeously and expenditure realistically.</p> <p>Demonstrate and define initial cost before work has started and profit that can be achieved when a product is completed.</p>	<p>Educator needs to describe and discuss features of occupational environment</p> <p>Described and discuss ways in which these features affect learning processes and/or application of learning</p> <p>Educator needs to carry out calculations using a calculator efficiently and correctly, and solutions obtained are verified in terms of the context.</p> <ul style="list-style-type: none"> Initial cost Expenditure on products Profit to be made
5-10	External examination	<p>External moderation of school assessment over terms 1, 2 and 3 = 50% of qualification</p> <p>Complete external Practical Assessment Task (PAT) = 25% of qualification</p> <p>Formal external assessment written test or oral = 25% of qualification</p>	

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%	o Practical 75%
	Theory 25%	Theory 25%	Theory 25%	
				o 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%	
Term Report	100%	100%	100%	External Pen and Paper Test 25%
End of Year	SBA 50%			External Exams 50%

CLARIFICATION ON ASSESSMENT PERIODS

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

Suggested Program of Assessment for Welding

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 & Safety Workshop Layout Equipment Measurement Hand tools Drawings Materials Methods of joining Opportunities in the industry 	Activity 1 Exercise in drawings and measurement	Practical Demonstration	25%	FAT 1
		Activity 2 Model	Practical	50%	
		Activity 3 Respond to questions	Pen and paper test (Oral or written)	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 & Safety Workshop Layout Equipment Measurement Hand tools Drawings Materials Methods of joining 	Activity 1 Measuring, Cutting & Tack weld	Demonstration	25%	FAT 1
		Activity 2 Model (PAT)	Practical	50%	
		Activity 3 Respond to questions	Pen and paper test (Oral or written)	25%	
Term 2	<ul style="list-style-type: none"> Safety Hand tools Power Tools Materials Methods of joining 	Activity 1 Model piece demonstrating a tack and fillet weld.	Demonstration	25%	FAT 2
		Activity 2 Model	Practical	50%	
		Activity 3 Respond to questions	Pen and paper test (Oral or written)	25%	
Term 3	<ul style="list-style-type: none"> Safety Hand tools Power Tools Drawings Materials Welding process- Arc welding equipment 	Activity 1 Demonstration	Demonstration	25%	FAT 3
		Activity 2 Model	Demonstration	50%	
		Activity 3 Respond to questions	Theory: Oral/ Written	25%	

Term 4	<ul style="list-style-type: none"> • Safety • Welding operations • Gas Arc Welding • Calculations 	Activity 1 Model (PAT)	Practical	75%	FAT 4
		Activity 2 Respond to questions	Pen and paper test (Oral or written)	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 & Safety Equipment Measurement Hand tools Materials Welding process-Arc Welder equipment. Calculations 	Activity1 Demonstration	Demonstration	25%	FAT 1
		Activity2 Model	Practical	50%	
		Activity3 Respond to questions	Pen and paper test (Oral or written)	25%	
Term 2	<ul style="list-style-type: none"> Safety Equipment Hand tools Power Tools Materials Selection Measuring Drawings & Shapes 	Activity1 Demonstration	Demonstration	25%	FAT 2
		Activity2 Model	Practical	50%	
		Activity3 Respond to questions	Pen and paper test (Oral or written)	25%	
Term 3	<ul style="list-style-type: none"> Safety Arc welding Process Oxy Fuel cutting Welding-Arc welder Core Welding Process 	Activity 1 Demonstration	Demonstration	25%	FAT 3
		Activity 2 Model	Demonstration	50%	
		Activity 3 Respond to questions	Pen and paper test (Oral or written)	25%	
Term 4	<ul style="list-style-type: none"> Safety Core Welding process Tools and equipment Materials Joining methods 	Activity 1 Model	Practical	75%	FAT 4
		Activity 2 Respond to questions	Pen and paper test (Oral or written)	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"> Safety and first aid Tools Equipment Materials Measurements Welding process Joining methods 	Activity 1 Demonstration	Demonstration	25%	FAT 1
		Activity 2 Model	Practical	50%	
		Activity 3 Respond to questions	Pen and paper test (Oral or written)	25%	
Term 2	<ul style="list-style-type: none"> Safety and first aid Work site practices Materials Material selection Drawings and shapes 	Activity 1 Model	Practical	75%	FAT 2
		Activity 2 Respond to questions	Pen and paper test (Oral or written)	25%	
Term 3	<ul style="list-style-type: none"> Safety and first aid Arc welding process Oxy fuel cutting Welding process (Arc) Joining methods 	Activity 1 Demonstration	Demonstration	25%	FAT 3
		Activity 2 Model	Practical	50%	
		Activity 3 Respond to questions	Pen and paper test (Oral or written)	25%	
Term 4	Core content and Concept across the year	External moderation of school assessment over terms 1, 2 and 3.		50%	GCE: TO Qualification
		Activity 1 Practical	Formal external Practical Assessment Task	25%	

		Activity 2 Respond to questions	Formal external assessment: Written test (or oral where necessary)	25%	
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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 Theory Assessment

FINAL EXAMINATION PAPER

SOS Year 1 (Draft)

Write in your school's name			
Technical: Welding	Assessment: Theory		Date:
Educators Name:	SOS Year: 1		Term: 1
Leaners Name:	Oral	Written	Marks allocated

This assessment is marked out of 25 marks. Answer the questions below, choose the correct answer in the answer block below each question

Question 1 (5)

What are the names of the following safety items that are used in the Welding workshop?



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Answer Block

Hammer	Bench vice	Safety boots	Leather gloves
Welding helmet	Welding screen	Clear safety glasses	Leather apron

Question 2 (5)

Answer each one of the following questions either		Yes	No
1	Can the Welding Workshop be left dirty and untidy?	Y	N
2	When you hurt yourself in the Welding Workshop must you report it?	Y	N
3	Are there safety signs displayed in the Welding Workshop?	Y	N
4	Can you work in the Welding Workshop without safety equipment?	Y	N
5	Can you run and play around in the Welding Workshop?	Y	N

Question 3 (5)

What are the names of the following items that are used in the Welding workshop?



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.....



.....

Answer block

overall	Wire brush	Earth clamp	Welding Electrodes
Electrode holder	Chipping hammer	Inverter welder	Drill press

Question 4 (5)

Choose the correct name for the material that is used by the following people?

1. What type of material does a person use to make braais/burglar bars?
2. The material used to make chains/rings and bangles?
3. What material types is used to cover fridges, kitchen sinks, pots and pans?
4. The material that was used in the manufacture of old machines and engine blocks?
.....

Answer block

Cast iron	Paint	Grinder	Gold and silver
Aluminium	Stainless steel	Mild steel	Sand paper

Question 5 (5)

Choose the correct name for the hand tools that are used in the welding workshop?



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Answer Block

Hack saw	Sanding Disc	Ball pin hammer	Hand files
Twisted drill bits	Bench vice	Nuts and bolts	G clamps

PUBLIC COMMENT

Annexure B Practical Assessment

Your schools name													
Technical: Welding							Educators Name :						
PRACTICAL PROJECT ASSESSMENT FOR END OF TERM													
NAME OF LEARNER:				CLASS: SOS 1			TERM 1			Date			
<p>Using a Hack-Saw, cut 1 piece of 25 x 3mm flat iron 100mm long, using a file make sure that all edges are clean. Mark the center of the material (length and width) using marking chalk and a center punch.</p> <p>Length</p> 													
Educators Comments:													
Fundamental Knowledge for Starting a Practical project												Total	
Does learner identify and apply safety equipment to start the practical project												5	
Can the learner identify and use the tools to do the project												5	
Has the learner followed safety procedures during manufacturing of practical project												5	
Can the learner interpret the drawing to manufacture practical project												5	
Does the learner's final project measure up to the picture/drawing that is supplied												5	
Fundamental Knowledge												25	
Assessment Rubric for Practical Projects													
#	Skill	1	2	3	4	5	6	7	8	9	10	Total	
1	Measure												
2	Cut												
3	Accuracy												
4	Effort												
5	Implementation												
Add the learner's fundamental and practical marks. = 75%													

Annexure C Theory Assessment

SOS Year 2 (Draft)

Your school's name			
Technical: Welding	Assessment: Theory		Date:
Educators Name:	SOS Year: 2		Term: 1
Leaners Name:	Oral	Written	Marks allocated:

This Assessment is marked out of 25marks. Answer the questions below, choose the correct answer in the answer block below each question

Question 1 (5)

What are the names for the following safety items that are used in the Welding workshop?



.....



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Answer Block

Hammer	Bench vice	Safety boots	Leather gloves
Welding helmet	Welding screen	Clear safety glasses	Leather apron

Question 2 (10)

Select the correct names for the hand and power tools that are used in the welding workshop?



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Side cutters	Socket set	Hand drill	G clamps	Pliers
Spanners	Hand files	Scriber	Bench	Ball pin hammer
Cut off saw	Sand paper	square	Small grinder	Hack & jnr saw

Question 3 (5)

What are the following safety items you would use in the case of an accident or an emergency?

1. What items to use when a fire breaks out in the workshop while welding?

.....

2. The item that you would put over your hands before welding/grinding?

.....

3. The opening that you will go through when you need to exit the workshop?

.....

4. The person that you must report all injuries and accidents to in the work-shop?

.....

5. What do you call the information boards that are in different colours posted all over the workshop?


Safety signs	Cell phone	Educator	Hard hat
Leather gloves	Fire hose	Nail polish	Doors

Question 4 (5)

Draw lines that measure the following lengths in millimetres and they should be clearly marked: -

- 115 mm, 56 mm, 83 mm, 129 mm, 65 mm

Annexure D Practical Assessment

Your school's name here												
Technical: Welding						Educator's Name:						
PRACTICAL PROJECT ASSESSMENT FOR END OF TERM												
NAME OF LEARNER:				CLASS: SOS 2			TERM 1			Date		
PICTURE/DRAWING OF PRACTICAL ASSESSMENT												
<p>Using a Hack-Saw, cut 1 piece of 50 x 3mm flat iron 100mm long, using a file make sure that all edges are clean. Mark the centre of the material (length) using marking chalk. Placing the material in the vice bend it to 90deg with the use of a ball pin hammer. Check the angle with a square.</p> <div style="text-align: center; margin-top: 20px;">  </div>												
Fundamental Knowledge for Starting a Practical project											Total	
Does learner identify and apply safety equipment to start the practical project											5	
Can the learner identify and use the tools to do the project											5	
Has the learner followed safety procedures during manufacturing of practical project											5	
Can the learner interpret the drawing to manufacture practical project											5	
Does the learner's final project measure up to the picture/drawing that is supplied											5	
Fundamental Knowledge											25	
Assessment Rubric for Practical Projects												
#	Skill	1	2	3	4	5	6	7	8	9	10	Total
1	Measure											
2	Cut											
3	Accuracy											
4	Effort											
5	Implementation											
Add the learner's fundamental and practical marks. = 75%												

Annexure E Theory Assessment

SOS Year 3 (Draft)

Place Your School's Name Here			
Technical: Welding	Assessment: Theory		Date:
Educators Name:	SOS Year: 3		Term: 1
Leaners Name:	Oral	Written	Marks allocated:

This assessment is marked out of 25marks. Answer the questions below, choose the correct answer in the answer block below each question

Question 1 (5)

There are five items choose the correct one for each question?

- This item you can you to cover and protect your workshop clothes while cutting/welding and working in a workshop?
- This power tool you can use for sanding, cutting and grinding?
- You can use these covers to protect your hands while welding and grinding and should be worn in the workshop daily?
- With this power tool you can make sure that all material cut at 90 & 45deg is done correctly?
- To protect your eyes and face while welding/grinding you wear this on your head?

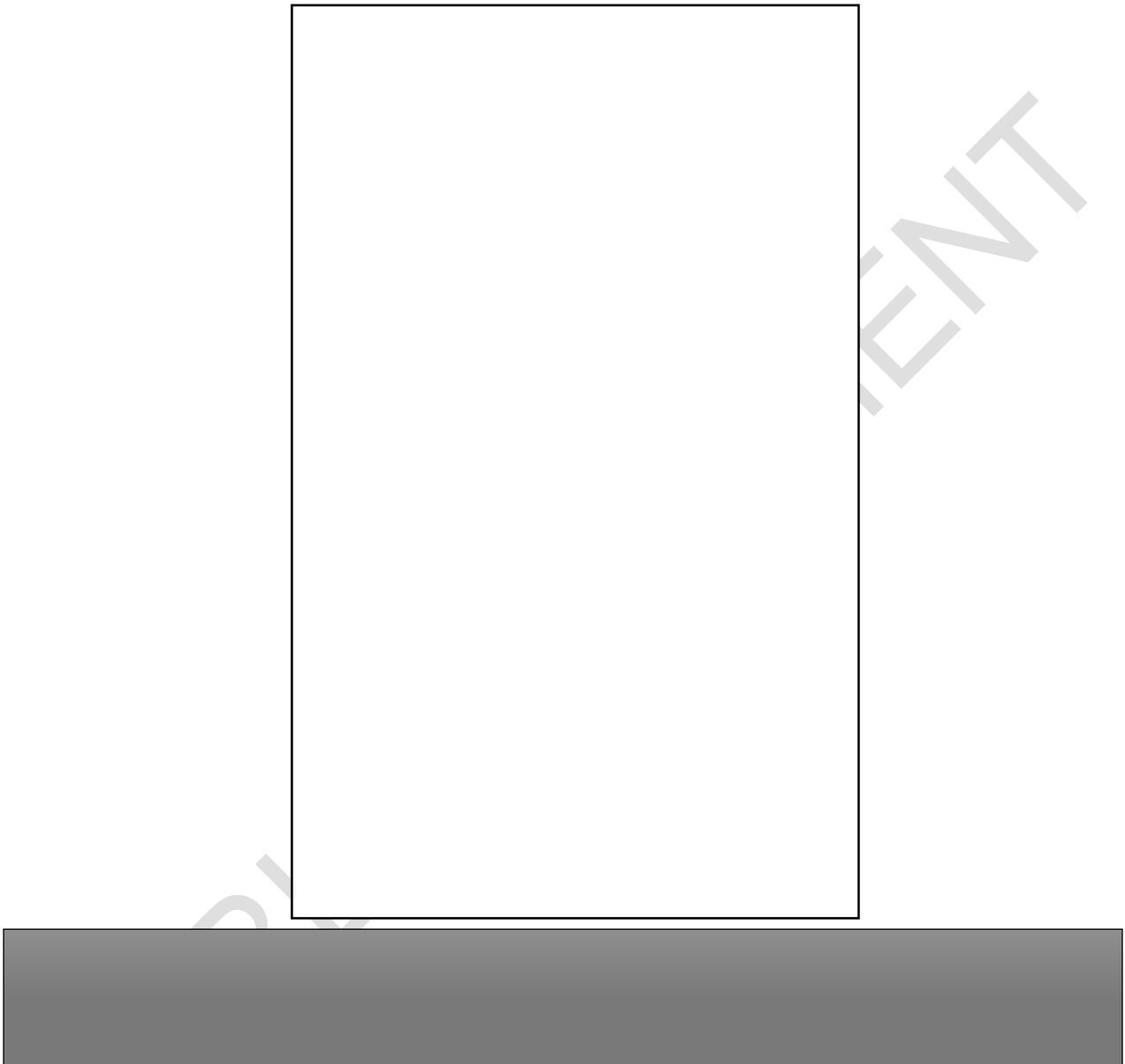
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5
1	2	3	4	5



1	2	3	4	5
---	---	---	---	---

Question 2 (10)

Draw a basic safety gate (patterns can be added) in the door frame but make sure that there is space around the frame so that the safety door can open? Use Ruler and try and be accurate when drawing.



Question 3 (5)

The following safety signs are posted in the workshop and they need to be identified? Choose the correct answer from the answer grid?



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Clear safety glass must be worn	Check for spilt oil on the workshop floor	Full face shield must be worn	The workshop must be swept clean daily
Leather gloves to be worn in the workshop	Switch the lights off to save electricity	Overalls must be worn daily in the workshop	Check that all the doors are opened for airflow.
These signs are not for the welding workshop	Wear earmuffs to protect your ears	Shows where the fire hose is mounted	Welding shields are used at the benches

Question 4 (5)

Choose the right answer for the following tools that are used in the Welding Workshop? Check for the answer in the answer block.



.....



.....



.....



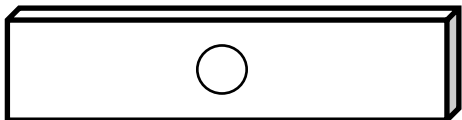

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Bench vice	Steel ruler	Drills bits	Overalls
Blow torch	Big jaw grips	Hand files	Scriber

Annexure F Practical Assessment

Your school's name												
Technical: Welding						Educator's Name:						
PRACTICAL PROJECT ASSESSMENT FOR END OF TERM												
NAME OF LEARNER:				CLASS: SOS 3			TERM 1			Date		
PICTURE/DRAWING OF PRACTICAL ASSESSMENT												
<p>Cut two 100 mm pieces of 50 x 5 mm mild steel flat. Take any of the two sections and drill an 8 mm hole in the center of the flat, completely through, Clean and chamfer all ends. Form a section by welding the top and bottom, grind one side only.</p> <div style="display: flex; justify-content: space-around; align-items: center;">   </div>												
Educator's Comments:												
Fundamental Knowledge for Starting a Practical project											Total	
Does learner identify and apply safety equipment to start the practical project											5	
Can the learner identify and use the tools to do the project											5	
Has the learner followed safety procedures during manufacturing of practical project											5	
Can the learner interpret the drawing to manufacture practical project											5	
Does the learner's final project measure up to the picture/drawing that is supplied											5	
Fundamental Knowledge											25	
Assessment Rubric for Practical Projects												
#	Skill	1	2	3	4	5	6	7	8	9	10	Total
1	Measure											
2	Cut											
3	Weld											
4	Drilling											
5	Grinding											
Add the learner's fundamental and practical marks. = 75%												

Annexure G Theory Assessment

SOS Year 4 (Draft)

Place School's Name Here			
Technical: Welding	Assessment: Theory		Date:
Educators Name:	SOS Year: 4		Term: 1
Leaners Name:	Oral	Written	Marks allocated:

This assessment is marked out of 25marks. Answer the questions below, choose the correct answer in the answer block below each question

Question 1 (5)

There are five signs choose the correct answer for each one?



Welder working	No playing	Overalls to be worn	Wear earmuffs	Clear tables
Use a grinding shield	No talking	Slippery floor	Keep the floor clean	Dirty floors

Question 2 (5)

The following power tools are used in the workshop, choose the correct use for each one?



A 115 mm angle grinder is used for



The cut-off saw is used for



Vacuum cleaner is used for



A portable hand drill can be used when



The compressor is used to store

Mark steel	Safety signs	Grind and cutting steel	When no electricity is available	Use a broom
Centre punch	Compressed air	Cutting of steel	Sand paper	Cleaning away dirt area after working

Question 3 (10)

Do a drawing of a gate with the measurements of: length 150 mm and the height of 100 mm. Draw lines that will half the length and the width. To strengthen your gate, draw lines that will go from each outside corner to each other. Please label your drawing properly.

Question 4 (5)

The following tools are used in the workshop; choose the correct answer for each tool?



..... Lubricate rusted and hard to loosening items.



..... Cleans away rust and dirt from materials.



..... Make lines and marks on steel.



..... Makes internal threads for bolts and nuts.

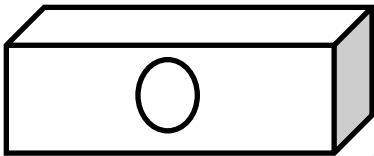
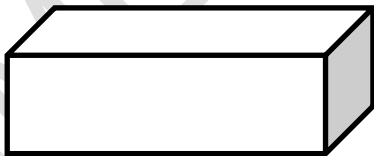


..... You can check that corners are square and 90 deg.

Answer Grid

Sand paper	Vice	Engineers square	Oil lube
Wire brush	Scriber	Hack saw	Tap and dies set

Annexure H Practical Assessment

Your schools name													
Technical: Welding							Educator's Name :						
PRACTICAL PROJECT ASSESSMENT FOR END OF TERM													
NAME OF LEARNER:				CLASS: SOS 4			TERM 1			Date			
PICTURE/DRAWING OF PRACTICAL ASSESSMENT													
<p>Cut two 100 mm pieces of 25x25x1, 6 mm mild steel angle iron. Take any of the two sections and drill an 8 mm hole in the center of the tubing, completely through, Clean and chamfer all ends. Form a T section by welding the top and bottom, grind one side only.</p> <div style="text-align: center; margin-top: 20px;">   </div>													
Fundamental Knowledge for Starting a Practical project												Total	
Does learner identify and apply safety equipment to start the practical project												5	
Can the learner identify and use the tools to do the project												5	
Has the learner followed safety procedures during manufacturing of practical project												5	
Can the learner interpret the drawing to manufacture practical project												5	
Does the learner's final project measure up to the picture/drawing that is supplied												5	
Fundamental Knowledge												25	
Assessment Rubric for Practical Projects													
	Skills	1	2	3	4	5	6	7	8	9	10	Total	
1	Measure												
2	Cut												
3	Weld												
4	Drilling												
5	Grinding												
Add the learner's fundamental and practical marks. = 75%													

Annexure I

POSSIBLE PRACTICAL EXAMPLES

Year	Year 1	Year 2	Year 3	Year 4
Term 1	<ul style="list-style-type: none"> Twisted candle holder Fruit bowl stand Display bicycle 	<ul style="list-style-type: none"> Lamp shade Wall brackets with shelves Braai tongs Braai grid 	<ul style="list-style-type: none"> Welding jigs Boot stand Towel rack stand Flower box rack 	<ul style="list-style-type: none"> Car ramps Jack stands Trolley Fold away braai Push cart
Term 2	X	<ul style="list-style-type: none"> Wall hanging flower stand Garden hose holder Love heart knot 	<ul style="list-style-type: none"> Steel tube ladder Steel bench Chair hollow tube 	<ul style="list-style-type: none"> Square tube table stand Low rider bicycle flower stand
Term 3	X	<ul style="list-style-type: none"> Mesh burglar guards Security gates 	<ul style="list-style-type: none"> Fire pit stand Ornamental crank shaft table Universal trolley <p style="text-align: center;">↓</p>	<ul style="list-style-type: none"> Oil drum chair Oil drum coffee table Oil drum braai
Term 4	X	↓	<ul style="list-style-type: none"> Old tool table and stand 	↓

Annexure J

Example of a rubric for formwork: This rubric can be adapted for any other project. This rubric is taken from the following document of the Department of Education: **NATIONAL CERTIFICATE (VOCATIONAL) NQF LEVEL 2, CONCRETE STRUCTURES 2009**

Learner Name: _____

Evaluation Criteria	Outstanding 9-10 marks 80 - 100 %	Highly Competent 7-8 marks 70 - 79%	Competent 5-6 marks 50 - 69 %	Not Yet Competent 3-4 marks 40 - 49%	Not Achieved 1-2 marks 0 - 39%	Outcomes Achieved		
						Yes	No	Rating
1. Interpret the given drawing and / or specification.	Has an outstanding understanding and interpretation of drawing and / or specification.	Correct understanding and interpretation of drawing and/or specification.	Understands and interprets drawing and/or specification.	Cannot interpret the drawing /or specification.	Does not understand and cannot interpret drawing and / or specification			
2. Correct selection of material.	Knows all the correct material required.	Correctly selects material without assistance.	Correctly selects material with assistance.	Could not identify the correct materials.	Selected the wrong materials.			
3. Setting out of formwork	Column is correctly set out from a concrete base and is from x-x and y-y grid lines.	Setting out procedures of a rectangular column are adhered to	Setting out procedures is adhered to with assistance.	Setting out of a rectangular column is not from x-x and y-y grid lines.	Cannot set out rectangular column as per specification			