



Western Cape
Government

Education

Annual Teaching Plan



Adapted Curriculum and Assessment Policy Statement
for Schools of Skills and Schools with Skills Units

Basic Welding and Metal Work

Year 1, 2, 3 and 4

2013

PREFACE TO THE ANNUAL TEACHING PLAN FOR THE SKILLS CURRICULUM

The Curriculum and Assessment Policy Statement has been adapted to meet the needs of learners who experience barriers to learning and who have been placed in a School of Skills. It has been designed to enable learners who continue their schooling at a School of Skills to develop to their potential based on a curriculum that supports their cognitive ability. These learners are afforded the opportunity to achieve in areas where they can be successful, such as learning a skill.

The skills curriculum document provides the content and skills to be taught across the four years. It is based on the curriculum as developed with teachers and is aligned to the SAQA qualifications used for skills development in South Africa. This document unpacks the curriculum as an Annual Teaching Plan (ATP) that will act as an exemplar for the sequencing and pacing of your teaching, learning and assessment per term across the four years.

Year One is an orientation year and learners must be exposed to a minimum of two vocational skills so that they can select a skill they will continue from Year Two. The content in Year One could be spread over one or two terms. This will differ from school to school depending on the programme for the year. Where content for Year One is based on one term only, schools must expand on the work to cover two term's workload. 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 in a School of Skills. It is important that learners are exposed to all the Exit Level Outcomes, Specific Outcomes and Assessment Criteria per selected vocational skill, acknowledging that not all learners will be successful in all of these. The certificate awarded in Year Four will indicate all Exit Level Outcomes and the learner's demonstrated level of competence.

It is envisaged that all learners in a School of Skills will exit the school with an appropriate Certificate of Attainment endorsed by the WCED. It is hoped that this certificate will enable them to access further or higher education or to be part of the world of work.

ACKNOWLEDGEMENT

A special word of appreciation and thanks go to all in the Western Cape Education Department and to the teaching staff in the Schools of Skills whose efforts made this document possible.

ANNUAL TEACHING PLAN FOR BASIC WELDING AND METAL WORK

CONTENT

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YEAR 1 ATP3

YEAR 2 ATP9

YEAR 3 ATP33

YEAR 4 ATP59

Note to the teacher

Exit Level Outcomes 13 and 15 provide the teaching and learning strategies to be used in the class. It is integrated into the delivery of all the Exit Level Outcomes.

Exit Level Outcome 13:

Use language and communication in occupational learning programmes.

o **Specific Outcome 1**

Find and use available learning resources

o **Assessment Criteria**

1. Identify relevant learning resources; resource centres, dictionaries, general texts, internet, other learners, videos.
2. Use learning resources effectively through appropriate selection of information and acknowledgement of sources.

o **Specific Outcome 2**

Use learning strategies.

o **Assessment Criteria**

1. Summarise information to be used for learning purposes.
2. Select specific techniques and applied appropriately; mind maps, note taking, memorising, key words, underlining, skimming and scanning.
3. Ask relevant questions; checking understanding, clarifying meaning, get information, asking for help.

o **Specific Outcome 3**

Manage occupational learning materials.

o **Assessment Criteria**

1. Organise occupational learning materials for efficient use; videos, texts, hand-outs, textbooks, charts, maps, plans, and diagrams
2. Explain and demonstrate layout and presentation of learning materials using; Index, contents page or glossaries are used effectively.
3. Explain technical language/ terminology

o **Specific Outcome 4**

Plan and gather relevant information for a given context and purpose.

o **Assessment Criteria**

1. Explain information gathering steps, planned and sequencing appropriately.
2. Explain information gathering techniques; Gathering information, reading/viewing, interviewing, observing, and using appropriate electronic sources.
3. Sift information for relevance.
4. Classify, categorise and sort information
5. Gather information for given context and purpose
6. Present conclusions in appropriate format

o **Specific Outcome 5**

Function in a team

o **Assessment Criteria**

1. Active participation happens in group learning situations; discussions, activities, workshops.
2. Responsibilities in the team are taken up and group work conventions are applied in learning situation; turn taking, rotation of roles: conducting, chairing, recording, and reporting.
3. Practice negotiating techniques
4. Teamwork results in meaningful products or outcomes; reaching consensus, completing tasks.

- **Specific Outcome 6**

Reflect on how characteristics of the workplace and occupational context affect learning.

- **Assessment Criteria**

1. Identify sector and organisation type:
 - Sector/occupational focus: Services, manufacturing, financial, educational etc.
 - Organisation type: Government, parastatal, heavy/light industry, large organisation, small business.
2. Describe and discuss features of occupational environment
3. Described and discuss ways in which these features affect learning processes and/or application of learning

Exit Level Outcome 15: (From year 2 onwards)

Write/present for a defined context.

- **Specific Outcome 1**

Write/ communicates for a specific audience, purpose and context.

- **Assessment Criteria**

1. Identify range of appropriate texts in response to tasks or learning activities
2. Format and content are appropriate to the conventions of the text type, and to the nature and level of the target audience, as well as to the task.
Format, visual presentation (headings, sub-headings, bullets, numbering, font, etc), appropriate dress.

- **Specific Outcome 2**

Adapt language to suit context. Socio-cultural, inclusivity, human rights, technical/workplace, environmental contexts

- **Assessment Criteria**

1. Identify inappropriate language
Excessive use of jargon, insensitive choice of words/signs, (gender; rank; hierarchies in familiar settings or organisations; family; sports; wealth).
2. Simplify complex wording/ideas where necessary.

YEAR 1- ANNUAL TEACHING PLAN

ORIENTATION TO BASIC WELDING AND METAL WORK
YEAR 1: ONE TERM

WK	CONTENT	ACTIVITIES
<p>Week 1 and 2</p>	<p>General Introduction to the Skill: Basic Welding and Metal Work</p> <p>Learners must be taught how to:</p> <ul style="list-style-type: none"> ⇒ Apply health and safety to work area ○ Identify potential hazards in the work area <ul style="list-style-type: none"> • Meet all safety requirements • Know implications of exposure to hazards. • Identify protective clothing requirements and use protective clothing ○ Limit damage to persons or property in the case of an emergency <ul style="list-style-type: none"> • Know the location of fire extinguishers, hoses and alarms • Report injuries involving individuals promptly to the relevant persons ○ Follow procedures that apply to injury in the work area <ul style="list-style-type: none"> • Demonstrate procedures for reporting and recording injury. ⇒ Comply with good housekeeping practices ○ Carry out good housekeeping routines <ul style="list-style-type: none"> • Carry out routines safely and in accordance with work requirements • Keep equipment clean and available for use when required. • Use cleaning equipment and materials safely and correctly. • Identify faults with equipment and reported to the relevant person. ○ Prepare workstation for safe and effective production <ul style="list-style-type: none"> • Clean workstations and keep free of hazards. • Check that equipment and tools for work to be carried out are operational and in condition for safe and effective work. ○ Comply with relevant housekeeping policies and procedures <ul style="list-style-type: none"> • Explain organisational housekeeping policies and procedures • Explain the importance of good housekeeping and the impact of poor housekeeping on people, processes, facilities and products. 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration

	<ul style="list-style-type: none"> • Comply appropriately and timeously with all housekeeping policies and procedures impacting on area of responsibility. • Identify and report any shortcomings in housekeeping practices to the appropriate authority. <ul style="list-style-type: none"> ○ Maintain effective working conditions <ul style="list-style-type: none"> • Carry out relevant safety routines according to requirements. • Handle equipment and tools safely without damage or injury • Keep the workstation clean, tidy and safe. • Return equipment and tools safely to correct storage after use 	
<p>Weeks 3 and 4</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 1: Select, use and care for engineering hand tools</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering hand tools. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identify, explain and use all the engineering hand tools; e.g. Hand files, screwdrivers, pliers, tin snips, hacksaws, hammers 2. Give clear explanations and appropriate examples 3. Refer to appropriate literature when giving explanation 4. Demonstrate the ability to apply the various engineering hand tools in their different applications ○ Specific Outcome 2 Care for and maintain engineering hand tools ○ Assessment Criteria <ol style="list-style-type: none"> 1. Carry out maintenance of engineering hand tools in accordance with the applicable requirements and workplace procedures 2. Respond correctly to task related questions to confirm understanding 3. Recognise and report problems, changes and/or malfunctions while working with engineering hand tools ○ Specific Outcome 3 Work safely with due care for self, fellow workers, equipment, materials and the environment. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and demonstrate safe working practises 2. Demonstrate an understanding of SHE procedures <p>Exit Level Outcome 2: Select, use and care for engineering measuring equipment</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering measuring equipment 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration

	<ul style="list-style-type: none"> ○ Assessment Criteria 1. Explain and discuss basic units of measure, symbols and derived units of measure 2. Use measuring equipment as recommended by the manufacturer to meet job/task requirements 3. Take measurements and record 4. Identify unsafe/faulty measuring equipment and take corrective action taken 5. Clean, service, maintain and store measuring equipment ○ Specific Outcome 2 Care for and maintain measuring equipment ○ Assessment Criteria 1. Explain and discusses basic units of measure, symbols and derived units of measure. 2. Select and use engineering measuring equipment <p>Exit Level Outcome 8: 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"> ○ Specific Outcome 1 Estimate, measure and calculate physical quantities to solve problems in practical situations. ○ Assessment Criteria 1. Identify and correctly read scales on the measuring instruments 2. Identify the appropriate instrument to measure a particular quantity. 3. Carry out calculations correctly 4. Explain and demonstrate appropriate units measurement and calculation. ○ Specific Outcome 2 Explore transformations of two-dimensional geometric figures ○ Assessment Criteria 1. Describe and identify properties of symmetrical shapes 2. Explain and identify concepts of lines of symmetry in 2-dimensional figures using paper folding and reflections in the lines of symmetry. 3. Explain and identify concepts of transformation in terms of reflections, translations and rotations using concrete materials. 	
<p>Weeks 5 - 9</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 9: Weld carbon steel work-pieces using the shielded metal arc welding process in the down-hand position.</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Describe the shielded metal arc welding process. 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources

	<ul style="list-style-type: none"> ○ Assessment Criteria 1. 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. 2. Identify and explain basic and major components of the shielded metal arc welding equipment in terms of manufacturer's requirements and standards. 3. Identify parts and components correctly and the implications for incorrect identification are explained. 4. Explain terms and definitions used with welding terminology as recorded in international welding standards. Parts include: Suitable power source, earth clamp, electrode holder and welding cable ○ Specific Outcome 2 Select, set up and conduct pre-operational checks of shielded metal arc welding equipment. ○ Assessment Criteria 1. Identify, verify and selection shielded metal arc welding equipment as specified on welding procedure specification 2. Identify and rectify hazards relating to welding process in accordance with standard work site practices. 3. Carry out pre-operational checks in accordance with manufacturer's specifications. Resources to include: manufacturer's operational manual, worksite practices and safety and environ-mental issues. ○ Specific Outcome 3 Prepare work-pieces prior to welding. ○ Assessment Criteria 1. Prepare work pieces prior to welding as specified on drawing and worksite procedures. 2. Identify dimensions and alignment as specified on drawing. 3. Tack welds work-piece in position as per drawing specifications. 4. Adhere to safety precautions. 5. Inspect work-piece prior to welding. Resources include - Worksite procedures, tools, equipment, safety requirements, and materials. ○ Specific Outcome 4 Weld work-pieces. ○ Assessment Criteria 1. Select welding electrodes as specified on welding procedure specification. 2. Weld work-piece in position. 3. Adhere to safety precautions during welding process. 4. Clean work-piece after welding as per worksite practices. 	<ul style="list-style-type: none"> ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration ○ Build Model
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	<p><u>Scope:</u> Material type to be used: May be chosen 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 - 1,6mm.</p> <p><u>Resources include:</u> Welding equipment, tools, protective clothing and equipment, welding procedure specification, materials, etc. Welding positions include: Butt and fillet welds in (<u>flat position:</u> square groove butt joint vee groove joint, lap joint, tee and conner joints) (<u>horizontal position:</u> groove joint, lap joint, tee joint)</p> <ul style="list-style-type: none"> ○ Specific Outcome 5 Inspect welded work piece for defects in compliance with drawing specifications ○ Assessment Criteria <ol style="list-style-type: none"> 1. Remove all residues slag and spatter as specified in cleaning procedure. 2. Welded work-piece conforms to job specifications 3. Inspection methods and procedures selected are conducive to specifications. ○ Specific Outcome 6 Care for and store welding consumables and equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Care for tools and equipment as per manufacturer's specifications and stored as per worksite practices. 2. Store tools and equipment to conform to worksite practices. 3. Store welding consumables in accordance to worksite practices. 	
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Week 10	<ul style="list-style-type: none"> • Pen and paper test 25% of term mark for basic Welding (Test may be given in any week as per school assessment plan) • Reflect and review 	•
<p>Assessment:</p> <p>Formal Assessment Task 1: (FAT 1)</p> <p>Activity 1 Demonstration: (In week 4) Learners demonstrate measuring and cutting skills using; (25 marks) Assess using a memorandum and rubric</p> <p>Activity 2 Model: (In weeks 5-8) Learners make a simple model using welding techniques (50 Marks) Assess using a rubric E.g. Measure, cut, file flat bar and or set up welding plant, strike arc, safety, tools, measuring equipment and or welding process)</p> <p>Note: <i>The following skills could be assessed in all demonstrations or models :</i></p> <ul style="list-style-type: none"> ○ <i>Measuring, Cutting, Welding, Grinding, Drilling , Application of safety aspects</i> <p>Activity 3 (Any time between weeks 5-10) Pen and Paper Test: (25 marks) Assess using a memorandum. ⇒ Learners respond to questions covering aspects listed below: Measure, cut, file flat bar , set up welding plant, strike arc, safety, tools, measuring equipment, welding process</p>		

YEAR 2- ANNUAL TEACHING PLAN

TERM 1

WK	CONTENT	ACTIVITIES
<p>Week 1 and 2</p>	<p>General Introduction to the Skill: Basic Welding and Metalwork</p> <p>Learners must be taught how to:</p> <ul style="list-style-type: none"> ⇒ Apply health and safety to work area ○ Identify potential hazards in the work area <ul style="list-style-type: none"> ● Meet all safety requirements ● Know implications of exposure to hazards. ● Identify protective clothing requirements and use protective clothing ○ Limit damage to persons or property in the case of an emergency <ul style="list-style-type: none"> ● Know the location of fire extinguishers, hoses and alarms ● Report injuries involving individuals promptly to the relevant persons ○ Follow procedures that apply to injury in the work area <ul style="list-style-type: none"> ● Demonstrate procedures for reporting and recording injury. ⇒ Comply with good housekeeping practices ○ Carry out good housekeeping routines <ul style="list-style-type: none"> ● Carry out routines safely and in accordance with work requirements ● Keep equipment clean and available for use when required. ● Use cleaning equipment and materials safely and correctly. ● Identify faults with equipment and reported to the relevant person. ○ Prepare workstation for safe and effective production <ul style="list-style-type: none"> ● Clean workstations and keep free of hazards. ● Check that equipment and tools for work to be carried out are operational and in condition for safe and effective work. ○ Comply with relevant housekeeping policies and procedures <ul style="list-style-type: none"> ● Explain organisational housekeeping policies and procedures ● Explain the importance of good housekeeping and the impact of poor housekeeping on people, processes, facilities and products. ● Comply appropriately and timeously with all housekeeping policies and procedures impacting on area of responsibility. 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration

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<p>Week 3 and 4</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 1: Select, use and care for engineering hand tools</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering hand tools. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identify, explain and use all the engineering hand tools; e.g. Hand files, screwdrivers, pliers, tin snips, hacksaws, hammers 2. Give clear explanations and appropriate examples 3. Refer to appropriate literature when giving explanation 4. Demonstrate the ability to apply the various engineering hand tools in their different applications ○ Specific Outcome 2 Care for and maintain engineering hand tools ○ Assessment Criteria <ol style="list-style-type: none"> 1. Carry out maintenance of engineering hand tools in accordance with the applicable requirements and workplace procedures 2. Respond correctly to task related questions to confirm understanding 3. Recognise and report problems, changes and/or malfunctions while working with engineering hand tools ○ Specific Outcome 3 Work safely with due care for self, fellow workers, equipment, materials and the environment. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and demonstrate safe working practises 2. Demonstrate an understanding of SHE procedures <p>Exit Level Outcome 2: Select, use and care for engineering measuring equipment</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering measuring equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and discuss basic units of measure, symbols and derived units of measure 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration

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<p>Weeks 5 - 9</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 9: Weld carbon steel work-pieces using the shielded metal arc welding process in the down-hand position.</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Describe the shielded metal arc welding process. ○ Assessment Criteria <ol style="list-style-type: none"> 1. 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. 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present

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	<p><u>Resources include:</u> Welding equipment, tools, protective clothing and equipment, welding procedure specification, materials, etc. Welding positions include: Butt and fillet welds in (<u>flat position:</u> square groove butt joint vee groove joint, lap joint, tee and conner joints) (<u>horizontal position:</u> groove joint, lap joint, tee joint)</p> <ul style="list-style-type: none"> ○ Specific Outcome 5 Inspect welded work piece for defects in compliance with drawing specifications ○ Assessment Criteria <ol style="list-style-type: none"> 1. Remove all residues slag and spatter as specified in cleaning procedure. 2. Welded work-piece conforms to job specifications 3. Inspection methods and procedures selected are conducive to specifications. ○ Specific Outcome 6 Care for and store welding consumables and equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Care for tools and equipment as per manufacturer's specifications and stored as per worksite practices. 2. Store tools and equipment to conform to worksite practices. 3. Store welding consumables in accordance to worksite practices. 	
<p>Week 10</p>	<ul style="list-style-type: none"> • Pen and paper test 25% of term mark for basic Welding (Test may be given in any week as per school assessment plan) • Reflect and review 	<ul style="list-style-type: none"> •

Assessment:

Formal Assessment Task 1: (FAT 1)

Activity 1

Demonstration: (In week 4)

Learners demonstrate measuring and cutting skills using;
(25 marks) Assess using a memorandum and rubric

Activity 2

Model: (In weeks 5-8)

Learners make a simple model using welding techniques
(50 Marks) Assess using a rubric

E.g. Measure, cut, file flat bar and or set up welding plant, strike arc, safety, tools, measuring equipment and or welding process)

Note:

The following skills could be assessed in all demonstrations or models :

- *Measuring, Cutting, Welding, Grinding, Drilling , Application of safety aspects*

Activity 3 (Any time between weeks 5-10)

Pen and Paper Test: (25 marks) Assess using a memorandum.

- ⇒ Learners respond to questions covering aspects listed below:
Measure, cut, file flat bar , set up welding plant, strike arc, safety,
tools, measuring equipment, welding process

YEAR 2- ANNUAL TEACHING PLAN

TERM 2

WK	CONTENT	ACTIVITIES
<p>Week 1</p>	<p>General Introduction to the Skill: Basic Welding and Metalwork</p> <p>Learners must be taught how to:</p> <p>⇒ Apply health and safety to work area</p> <ul style="list-style-type: none"> ○ Identify potential hazards in the work area <ul style="list-style-type: none"> ● Meet all safety requirements ● Know implications of exposure to hazards. ● Identify protective clothing requirements and use protective clothing ○ Limit damage to persons or property in the case of an emergency <ul style="list-style-type: none"> ● Know the location of fire extinguishers, hoses and alarms ● Report injuries involving individuals promptly to the relevant persons ○ Follow procedures that apply to injury in the work area <ul style="list-style-type: none"> ● Demonstrate procedures for reporting and recording injury. <p>⇒ Comply with good housekeeping practices</p> <ul style="list-style-type: none"> ○ Carry out good housekeeping routines <ul style="list-style-type: none"> ● Carry out routines safely and in accordance with work requirements ● Keep equipment clean and available for use when required. ● Use cleaning equipment and materials safely and correctly. ● Identify faults with equipment and reported to the relevant person. ○ Prepare workstation for safe and effective production <ul style="list-style-type: none"> ● Clean workstations and keep free of hazards. ● Check that equipment and tools for work to be carried out are operational and in condition for safe and effective work. ○ Comply with relevant housekeeping policies and procedures <ul style="list-style-type: none"> ● Explain organisational housekeeping policies and procedures ● Explain the importance of good housekeeping and the impact of poor housekeeping on people, processes, facilities and products. ● Comply appropriately and timeously with all housekeeping policies and procedures impacting on area of responsibility. 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration

	<ul style="list-style-type: none"> • Identify and report any shortcomings in housekeeping practices to the appropriate authority. ○ Maintain effective working conditions <ul style="list-style-type: none"> • Carry out relevant safety routines according to requirements. • Handle equipment and tools safely without damage or injury • Keep the workstation clean, tidy and safe. • Return equipment and tools safely to correct storage after use 	
<p>Week 2 and 3</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 1: Select, use and care for engineering hand tools</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering hand tools. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identify, explain and use all the engineering hand tools; e.g. hand files, spanners, socket sets, specialised sockets, impact sockets, torque wrench, Allen keys, screwdrivers, pliers, clamps, tin snips, hacksaws, chisels, metal shears, hammers. 2. Give clear explanations and appropriate examples 3. Refer to appropriate literature when giving explanation 4. Demonstrate the ability to apply the various engineering hand tools in their different applications ○ Specific Outcome 2 Care for and maintain engineering hand tools ○ Assessment Criteria <ol style="list-style-type: none"> 1. Carry out maintenance of engineering hand tools in accordance with the applicable requirements and workplace procedures 2. Respond correctly to task related questions to confirm understanding 3. Recognise and report problems, changes and/or malfunctions while working with engineering hand tools ○ Specific Outcome 3 Work safely with due care for self, fellow workers, equipment, materials and the environment. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and demonstrate safe working practises 2. Demonstrate an understanding of SHE procedures <p>Exit Level Outcome 2: Select, use and care for engineering measuring equipment</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering measuring equipment 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration

	<ul style="list-style-type: none"> ○ Assessment Criteria 1. Explain and discuss basic units of measure, symbols and derived units of measure 2. Use measuring equipment as recommended by the manufacturer to meet job/task requirements 3. Take measurements and record 4. Identify unsafe/faulty measuring equipment and take corrective action taken 5. Clean, service, maintain and store measuring equipment ○ Specific Outcome 2 Care for and maintain measuring equipment ○ Assessment Criteria 1. Explain and discuss basic units of measure, symbols and derived units of measure. 2. Select and use engineering measuring equipment Exit Level Outcome 8: Measure, estimate and calculate physical quantities and explore, describe and represent geometrical relationships in 2-dimensions in different life or workplace context ○ Specific Outcome 1 Estimate, measure and calculate physical quantities to solve problems in practical situations. ○ Assessment Criteria 1. Identify and correctly read scales on the measuring instruments 2. Identify the appropriate instrument to measure a particular quantity. 3. Carry out calculations correctly 4. Explain and demonstrate appropriate units measurement and calculation. ○ Specific Outcome 2 Explore transformations of two-dimensional geometric figures ○ Assessment Criteria 1. Describe and identify properties of symmetrical shapes 2. Explain and identify concepts of lines of symmetry in 2-dimensional figures using paper folding and reflections in the lines of symmetry. 3. Explain and identify concepts of transformation in terms of reflections, translations and rotations using concrete materials. 	
<p>Weeks 4 - 9</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 6: Identify and select material to specification</p> <ul style="list-style-type: none"> ○ Specific Outcome 2 Identify materials to specification. 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources

	<ul style="list-style-type: none"> ○ Assessment Criteria 1. Identification of materials in accordance with material specification sheet as included in work instructions. 2. Demonstrate all safety precautions in relation to work site practices and procedures 3. Identify materials marked with colour code or identification numbers. Materials to be identified, limited to mild steel, and carbon steels Identification methods visually with the aid of de-coding systems and mechanical processes <p>Exit Level Outcome 9: Weld carbon steel work-pieces using the shielded metal arc welding process in the down-hand position.</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Describe the shielded metal arc welding process. ○ Assessment Criteria 1. 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. 2. Identify and explain basic and major components of the shielded metal arc welding equipment in terms of manufacturer's requirements and standards. 3. Identify parts and components correctly and the implications for incorrect identification are explained. 4. Explain terms and definitions used with welding terminology as recorded in international welding standards. Parts include: Suitable power source, earth clamp, electrode holder and welding cable ○ Specific Outcome 2 Select, set up and conduct pre-operational checks of shielded metal arc welding equipment. ○ Assessment Criteria 1. Identify, verify and selection shielded metal arc welding equipment as specified on welding procedure specification 2. Identify and rectify hazards relating to welding process in accordance with standard work site practices. 3. Carry out pre-operational checks in accordance with manufacturer's specifications. Resources to include: manufacturer's operational manual, worksite practices and safety and environmental issues. ○ Specific Outcome 3 Prepare work-pieces prior to welding. ○ Assessment Criteria 1. Prepare work pieces prior to welding as specified on drawing and worksite procedures. 2. Identify dimensions and alignment as specified on drawing. 3. Tack welds work-piece in position as per drawing specifications. 	<ul style="list-style-type: none"> ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration ○ Build Model
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	<p>4. Adhere to safety precautions.</p> <p>5. Inspect work-piece prior to welding. Resources include - Worksite procedures, tools, equipment, safety requirements, and materials.</p> <p>○ Specific Outcome 4 Weld work-pieces.</p> <p>○ Assessment Criteria</p> <ol style="list-style-type: none"> 1. Select welding electrodes as specified on welding procedure specification. 2. Weld work-piece in position. 3. Adhere to safety precautions during welding process. 4. Clean work-piece after welding as per worksite practices. <p><u>Scope:</u> Material type to be used: May be chosen from the range of carbon steels (plate only), applicable to the material groups 1, 2, 3 or 11 [according to ISO (TR) 15608]. <u>Material thickness:</u> Minimum - 1,6mm. <u>Resources include:</u> Welding equipment, tools, protective clothing and equipment, welding procedure specification, materials, etc. <u>Welding positions include:</u> Butt and fillet welds in (<u>flat position:</u> square groove butt joint vee groove joint, lap joint, tee and conner joints) (<u>horizontal position:</u> groove joint, lap joint, tee joint)</p> <p>○ Specific Outcome 5 Inspect welded work piece for defects in compliance with drawing specifications</p> <p>○ Assessment Criteria</p> <ol style="list-style-type: none"> 1. Remove all residues slag and spatter as specified in cleaning procedure. 2. Welded work-piece conforms to job specifications 3. Inspection methods and procedures selected are conducive to specifications. <p>○ Specific Outcome 6 Care for and store welding consumables and equipment</p> <p>○ Assessment Criteria</p> <ol style="list-style-type: none"> 1. Care for tools and equipment as per manufacturer's specifications and stored as per worksite practices. 2. Store tools and equipment to conform to worksite practices. 3. Store welding consumables in accordance to worksite practices. 	
<p>Week 10</p>	<ul style="list-style-type: none"> • Pen and paper test 25% of term mark for basic Welding (Test may be given in any week as per school assessment plan) • Reflect and review 	<ul style="list-style-type: none"> •

Assessment:

Formal Assessment Task 1: (FAT 2)

Activity 1

Demonstration: (In week 3)

Learners demonstrate measuring and cutting skills using;
(25 marks) Assess using a memorandum and rubric

Activity 2

Model: (In weeks 4-8)

Learners make a simple model using welding techniques
(50 Marks) Assess using a rubric

E.g. Measure, cut, file flat bar and or set up welding plant, strike arc, safety, tools, measuring equipment and or welding process)

Note:

The following skills could be assessed in all demonstrations or models :

- *Measuring, Cutting, Welding, Grinding, Drilling , Application of safety aspects*

Activity 3 (Any time between weeks 5-10)

Pen and Paper Test: (25 marks) Assess using a memorandum.

- ⇒ Learners respond to questions covering aspects listed below:
Measure, cut, file flat bar , set up welding plant, strike arc, safety,
tools, measuring equipment, welding process

YEAR 2- ANNUAL TEACHING PLAN

TERM 3

WK	CONTENT	ACTIVITIES
<p>Week 1</p>	<p>Learners must be taught how to: Exit Level Outcome 1: Select, use and care for engineering hand tools</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering hand tools ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identify, explain and use all the engineering hand tools; e.g. hand files, spanners, socket sets, specialised sockets, impact sockets, torque wrench, Allen keys, screwdrivers, pliers, clamps, tin snips, hacksaws, chisels, metal shears, hammers, 2. Give clear explanations and appropriate examples 3. Refer to appropriate literature when giving explanation 4. Demonstrate the ability to apply the various engineering hand tools in their different applications ○ Specific Outcome 2 Care for and maintain engineering hand tools. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Carry out maintenance of engineering hand tools in accordance with the applicable requirements and workplace procedures 2. Respond correctly to task related questions to confirm understanding 3. Recognise and report problems, changes and/or malfunctions while working with engineering hand tools ○ Specific Outcome 3 Work safely with due care for self, fellow workers, equipment, materials and the environment. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and demonstrate safe working practises 2. Demonstrate an understanding of SHE procedures <p>Exit Level Outcome 2: Select, use and care for engineering measuring equipment</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering measuring equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and discuss basic units of measure, symbols and derived units of measure 2. Use measuring equipment as recommended by the manufacturer to meet job/task requirements 3. Take measurements and record 4. Identify unsafe/faulty measuring equipment and take corrective action taken 5. Clean, service, maintain and store measuring equipment 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration

	<ul style="list-style-type: none"> ○ Specific Outcome 2 Care for and maintain measuring equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and discuss basic units of measure, symbols and derived units of measure. 2. Select and use engineering measuring equipment <p>Exit Level Outcome 8: 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"> ○ Specific Outcome 1 Estimate, measure and calculate physical quantities to solve problems in practical situations. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identify and correctly read scales on the measuring instruments 2. Identify the appropriate instrument to measure a particular quantity. 3. Carry out calculations correctly 4. Explain and demonstrate appropriate units measurement and calculation. ○ Specific Outcome 2 Explore transformations of two-dimensional geometric figures ○ Assessment Criteria <ol style="list-style-type: none"> 1. Describe and identify properties of symmetrical shapes 2. Explain and identify concepts of lines of symmetry in 2-dimensional figures using paper folding and reflections in the lines of symmetry. 3. Explain and identify concepts of transformation in terms of reflections, translations and rotations using concrete materials. 	
<p>Weeks 2 and 3</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 3: Select, use and care for engineering power tools</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering power tools <p>Assessment Criteria</p> <ol style="list-style-type: none"> 1. Use appropriate power tools as recommended by the manufacturer to meet job/task requirements 2. Identify and take corrective action with regards to unsafe/faulty power tools 3. Clean, service, maintained and stored power tools 4. Maintain a clean and tidy work environment 5. Explain and discuss consequences of incorrectly using power tools, 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration

	<p>6. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws)</p> <ul style="list-style-type: none"> ○ Specific Outcome 2 Check on power supply connections to equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and discuss risks and hazards related to the various power supply sources 2. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws) ○ Specific Outcome 3 Recognise and report problems, changes and/or malfunctions while working ○ Assessment Criteria <ol style="list-style-type: none"> 1. Report problems timorously to appropriate personnel 2. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws) ○ Specific Outcome 4 Work safely with due care for self, fellow workers, machines, equipment, materials and environment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Take correct safety precautions against bad connections, damaged air and hydraulic hoses, damaged electrical cables, cracked discs and worn or damaged blades. 2. Use appropriate personal protective equipment when using power tools 3. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws) 	
<p>Week 4 to 9</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 6: Identify and select material to specification</p> <ul style="list-style-type: none"> ○ Specific Outcome 2 Identify materials to specification. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identification of materials in accordance with material specification sheet as included in work instructions. 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations

	<p>2. Demonstrate all safety precautions in relation to work site practices and procedures</p> <p>3. Identify materials marked with colour code or identification numbers. Materials to be identified, limited to mild steel, and carbon steels Identification methods visually with the aid of de-coding systems and mechanical processes</p> <p>Exit Level Outcome 9: Weld carbon steel work-pieces using the shielded metal arc welding process in the down-hand position.</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Describe the shielded metal arc welding process. ○ Assessment Criteria <ol style="list-style-type: none"> 1. 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. 2. Identify and explain basic and major components of the shielded metal arc welding equipment in terms of manufacturer's requirements and standards. 3. Identify parts and components correctly and the implications for incorrect identification are explained. 4. Explain terms and definitions used with welding terminology as recorded in international welding standards. Parts include: Suitable power source, earth clamp, electrode holder and welding cable ○ Specific Outcome 2 Select, set up and conduct pre-operational checks of shielded metal arc welding equipment. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identify, verify and selection shielded metal arc welding equipment as specified on welding procedure specification 2. Identify and rectify hazards relating to welding process in accordance with standard work site practices. 3. Carry out pre-operational checks in accordance with manufacturer's specifications. Resources to include: manufacturer's operational manual, worksite practices and safety and environ-mental issues. ○ Specific Outcome 3 Prepare work-pieces prior to welding. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Prepare work pieces prior to welding as specified on drawing and worksite procedures. 2. Identify dimensions and alignment as specified on drawing. 3. Tack welds work-piece in position as per drawing specifications. 4. Adhere to safety precautions. 5. Inspect work-piece prior to welding. Resources include - Worksite procedures, tools, equipment, safety requirements, and materials. 	<ul style="list-style-type: none"> ○ Present information visually ○ Practical demonstration ○ Build Model
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	<ul style="list-style-type: none"> ○ Specific Outcome 4 Weld work-pieces. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Select welding electrodes as specified on welding procedure specification. 2. Weld work-piece in position. 3. Adhere to safety precautions during welding process. 4. Clean work-piece after welding as per worksite practices. <p><u>Scope:</u> Material type to be used: May be chosen 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 - 1,6mm. <u>Resources include:</u> Welding equipment, tools, protective clothing and equipment, welding procedure specification, materials, etc. Welding positions include: Butt and fillet welds in (<u>flat position</u>: square groove butt joint vee groove joint, lap joint, tee and conner joints) (<u>horizontal position</u>: groove joint, lap joint, tee joint)</p> <ul style="list-style-type: none"> ○ Specific Outcome 5 Inspect welded work piece for defects in compliance with drawing specifications ○ Assessment Criteria <ol style="list-style-type: none"> 1. Remove all residues slag and spatter as specified in cleaning procedure. 2. Welded work-piece conforms to job specifications 3. Inspection methods and procedures selected are conducive to specifications. ○ Specific Outcome 6 Care for and store welding consumables and equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Care for tools and equipment as per manufacturer's specifications and stored as per worksite practices. 2. Store tools and equipment to conform to worksite practices. 3. Store welding consumables in accordance to worksite practices. 	
Week 10	<ul style="list-style-type: none"> • Pen and paper test 25% of term mark for basic Welding (Test may be given in any week as per school assessment plan) • Reflect and review 	

Assessment

Formal Assessment Task 1:

Activity 1

Demonstration:

(25 marks) Assess using a memorandum and rubric

Activity 2

Model:

Learners make a simple model using welding techniques

(50 Marks) Assess using a rubric

Note:

The following skills could be assessed in all demonstrations or models :

- *Measuring, Cutting, Welding, Grinding, Drilling , Application of safety aspects*

Activity 3

Pen and Paper Test: (25 marks) Assess using a memorandum.

- Learners respond to questions

YEAR 2- ANNUAL TEACHING PLAN

TERM 4

WK	CONTENT	ACTIVITIES
<p>Week 1</p>	<p>Learners must be taught how to: Exit Level Outcome 1: Select, use and care for engineering hand tools</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering hand tools ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identify, explain and use all the engineering hand tools; e.g. hand files, spanners, socket sets, specialised sockets, impact sockets, torque wrench, Allen keys, screwdrivers, pliers, clamps, tin snips, hacksaws, chisels, metal shears, hammers, 2. Give clear explanations and appropriate examples 3. Refer to appropriate literature when giving explanation 4. Demonstrate the ability to apply the various engineering hand tools in their different applications ○ Specific Outcome 2 Care for and maintain engineering hand tools. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Carry out maintenance of engineering hand tools in accordance with the applicable requirements and workplace procedures 2. Respond correctly to task related questions to confirm understanding 3. Recognise and report problems, changes and/or malfunctions while working with engineering hand tools ○ Specific Outcome 3 Work safely with due care for self, fellow workers, equipment, materials and the environment. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and demonstrate safe working practises 2. Demonstrate an understanding of SHE procedures <p>Exit Level Outcome 2: Select, use and care for engineering measuring equipment</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering measuring equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and discuss basic units of measure, symbols and derived units of measure 2. Use measuring equipment as recommended by the manufacturer to meet job/task requirements 3. Take measurements and record 4. Identify unsafe/faulty measuring equipment and take corrective action taken 5. Clean, service, maintain and store measuring equipment 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration

	<ul style="list-style-type: none"> ○ Specific Outcome 2 Care for and maintain measuring equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and discuss basic units of measure, symbols and derived units of measure. 2. Select and use engineering measuring equipment <p>Exit Level Outcome 8: 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"> ○ Specific Outcome 1 Estimate, measure and calculate physical quantities to solve problems in practical situations. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identify and correctly read scales on the measuring instruments 2. Identify the appropriate instrument to measure a particular quantity. 3. Carry out calculations correctly 4. Explain and demonstrate appropriate units measurement and calculation. ○ Specific Outcome 2 Explore transformations of two-dimensional geometric figures ○ Assessment Criteria <ol style="list-style-type: none"> 1. Describe and identify properties of symmetrical shapes 2. Explain and identify concepts of lines of symmetry in 2-dimensional figures using paper folding and reflections in the lines of symmetry. 3. Explain and identify concepts of transformation in terms of reflections, translations and rotations using concrete materials. 	
<p>Weeks 2 and 3</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 3: Select, use and care for engineering power tools</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering power tools <p>Assessment Criteria</p> <ol style="list-style-type: none"> 1. Use appropriate power tools as recommended by the manufacturer to meet job/task requirements 2. Identify and take corrective action with regards to unsafe/faulty power tools 3. Clean, service, maintained and stored power tools 4. Maintain a clean and tidy work environment 5. Explain and discuss consequences of incorrectly using power tools, 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration

	<p>6. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws)</p> <ul style="list-style-type: none"> ○ Specific Outcome 2 Check on power supply connections to equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and discuss risks and hazards related to the various power supply sources 2. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws) ○ Specific Outcome 3 Recognise and report problems, changes and/or malfunctions while working ○ Assessment Criteria <ol style="list-style-type: none"> 1. Report problems timorously to appropriate personnel 2. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws) ○ Specific Outcome 4 Work safely with due care for self, fellow workers, machines, equipment, materials and environment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Take correct safety precautions against bad connections, damaged air and hydraulic hoses, damaged electrical cables, cracked discs and worn or damaged blades. 2. Use appropriate personal protective equipment when using power tools 3. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws) 	
<p>Week 4 to 9</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 6: Identify and select material to specification</p> <ul style="list-style-type: none"> ○ Specific Outcome 2 Identify materials to specification. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identification of materials in accordance with material specification sheet as included in work instructions. 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations

	<p>2. Demonstrate all safety precautions in relation to work site practices and procedures Identify materials marked with colour code or identification numbers. Materials to be identified, limited to mild steel, and carbon steels Identification methods visually with the aid of de-coding systems and mechanical processes</p> <p>Exit Level Outcome 9: Weld carbon steel work-pieces using the shielded metal arc welding process in the down-hand position.</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Describe the shielded metal arc welding process. ○ Assessment Criteria <ol style="list-style-type: none"> 1. 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. 2. Identify and explain basic and major components of the shielded metal arc welding equipment in terms of manufacturer's requirements and standards. 3. Identify parts and components correctly and the implications for incorrect identification are explained. 4. Explain terms and definitions used with welding terminology as recorded in international welding standards. Parts include: Suitable power source, earth clamp, electrode holder and welding cable ○ Specific Outcome 2 Select, set up and conduct pre-operational checks of shielded metal arc welding equipment. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identify, verify and selection shielded metal arc welding equipment as specified on welding procedure specification 2. Identify and rectify hazards relating to welding process in accordance with standard work site practices. 3. Carry out pre-operational checks in accordance with manufacturer's specifications. Resources to include: manufacturer's operational manual, worksite practices and safety and environ-mental issues. ○ Specific Outcome 3 Prepare work-pieces prior to welding. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Prepare work pieces prior to welding as specified on drawing and worksite procedures. 2. Identify dimensions and alignment as specified on drawing. 3. Tack welds work-piece in position as per drawing specifications. 4. Adhere to safety precautions. 5. Inspect work-piece prior to welding. Resources include - Worksite procedures, tools, equipment, safety requirements, and materials. 	<ul style="list-style-type: none"> ○ Present information visually ○ Practical demonstration ○ Build Model
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	<ul style="list-style-type: none"> ○ Specific Outcome 4 Weld work-pieces. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Select welding electrodes as specified on welding procedure specification. 2. Weld work-piece in position. 3. Adhere to safety precautions during welding process. 4. Clean work-piece after welding as per worksite practices. <p><u>Scope:</u> Material type to be used: May be chosen 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 - 1,6mm. <u>Resources include:</u> Welding equipment, tools, protective clothing and equipment, welding procedure specification, materials, etc. Welding positions include: Butt and fillet welds in (<u>flat position</u>: square groove butt joint vee groove joint, lap joint, tee and conner joints) (<u>horizontal position</u>: groove joint, lap joint, tee joint)</p> <ul style="list-style-type: none"> ○ Specific Outcome 5 Inspect welded work piece for defects in compliance with drawing specifications ○ Assessment Criteria <ol style="list-style-type: none"> 1. Remove all residues slag and spatter as specified in cleaning procedure. 2. Welded work-piece conforms to job specifications 3. Inspection methods and procedures selected are conducive to specifications. ○ Specific Outcome 6 Care for and store welding consumables and equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Care for tools and equipment as per manufacturer's specifications and stored as per worksite practices. 2. Store tools and equipment to conform to worksite practices. 3. Store welding consumables in accordance to worksite practices. 	
Week 10	<ul style="list-style-type: none"> • Pen and paper test 25% of term mark for basic Welding (Test may be given in any week as per school assessment plan) • Reflect and review 	

Assessment

Formal Assessment Task 1:

Activity 1

Demonstration:

(25 marks) Assess using a memorandum and rubric

Activity 2

Model:

Learners make a simple model using welding techniques

(50 Marks) Assess using a rubric

Note:

The following skills could be assessed in all demonstrations or models :

- *Measuring, Cutting, Welding, Grinding, Drilling , Application of safety aspects*

Activity 3

Pen and Paper Test: (25 marks) Assess using a memorandum.

- Learners respond to questions

YEAR 3- ANNUAL TEACHING PLAN

TERM 1

WK	CONTENT	ACTIVITIES
<p>Week 1</p>	<p>Learners must be taught how to: Exit Level Outcome 1: Select, use and care for engineering hand tools</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering hand tools ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identify, explain and use all the engineering hand tools; e.g. hand files, spanners, socket sets, specialised sockets, impact sockets, torque wrench, Allen keys, screwdrivers, pliers, clamps, tin snips, hacksaws, chisels, metal shears, hammers, beating files, dollies, spoons, pullers, mallets, bench stakes, files, scrapers, hole punches, anvils and riveters spray guns, sanding blocks, body filler mixing and application tools, 2. Give clear explanations and appropriate examples 3. Refer to appropriate literature when giving explanation 4. Demonstrate the ability to apply the various engineering hand tools in their different applications ○ Specific Outcome 2 Care for and maintain engineering hand tools. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Carry out maintenance of engineering hand tools in accordance with the applicable requirements and workplace procedures 2. Respond correctly to task related questions to confirm understanding 3. Recognise and report problems, changes and/or malfunctions while working with engineering hand tools ○ Specific Outcome 3 Work safely with due care for self, fellow workers, equipment, materials and the environment. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and demonstrate safe working practises 2. Demonstrate an understanding of SHE procedures <p>Exit level Outcome 2: Select, use and care for engineering measuring equipment</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering measuring equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and discuss basic units of measure, symbols and derived units of measure 2. Use measuring equipment as recommended by the manufacturer to meet job/task requirements 3. Take measurements and record 4. Identify unsafe/faulty measuring equipment and take corrective action taken 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration

	<p>5. Clean, service, maintain and store measuring equipment</p> <ul style="list-style-type: none"> ○ Specific Outcome 2 Care for and maintain measuring equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and discuss basic units of measure, symbols and derived units of measure. 2. Select and use engineering measuring equipment <p>Exit Level Outcome 8: 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"> ○ Specific Outcome 1 Estimate, measure and calculate physical quantities to solve problems in practical situations. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identify and correctly read scales on the measuring instruments 2. Identify the appropriate instrument to measure a particular quantity. 3. Carry out calculations correctly 4. Explain and demonstrate appropriate units measurement and calculation. ○ Specific Outcome 2 Explore transformations of two-dimensional geometric figures ○ Assessment Criteria <ol style="list-style-type: none"> 1. Describe and identify properties of symmetrical shapes 2. Explain and identify concepts of lines of symmetry in 2-dimensional figures using paper folding and reflections in the lines of symmetry. 3. Explain and identify concepts of transformation in terms of reflections, translations and rotations using concrete materials. 	
<p>Weeks 2 and 3</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 3: Select, use and care for engineering power tools</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering power tools <p>Assessment Criteria</p> <ol style="list-style-type: none"> 1. Use appropriate power tools as recommended by the manufacturer to meet job/task requirements 2. Identify and take corrective action with regards to unsafe/faulty power tools 3. Clean, service, maintained and stored power tools 4. Maintain a clean and tidy work environment 5. Explain and discuss consequences of incorrectly using power tools, 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration

	<p>6. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws)</p> <ul style="list-style-type: none"> ○ Specific Outcome 2 Check on power supply connections to equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and discuss risks and hazards related to the various power supply sources 2. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws) ○ Specific Outcome 3 Recognise and report problems, changes and/or malfunctions while working ○ Assessment Criteria <ol style="list-style-type: none"> 1. Report problems timorously to appropriate personnel 2. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws) ○ Specific Outcome 4 Work safely with due care for self, fellow workers, machines, equipment, materials and environment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Take correct safety precautions against bad connections, damaged air and hydraulic hoses, damaged electrical cables, cracked discs and worn or damaged blades. 2. Use appropriate personal protective equipment when using power tools 3. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws) 	
<p>Week 4 to 9</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 6: Identify and select material to specification</p> <ul style="list-style-type: none"> ○ Specific Outcome 2 Identify materials to specification. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identification of materials in accordance with material specification sheet as included in work instructions. 2. Demonstrate all safety precautions in relation to work site practices and procedures 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present

	<p>3. Identify materials marked with colour code or identification numbers. Materials to be identified, limited to mild steel, and carbon steels Identification methods visually with the aid of de-coding systems and mechanical processes</p> <p>Exit Level Outcome 9: Weld carbon steel work-pieces using the shielded metal arc welding process in the down-hand position.</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Describe the shielded metal arc welding process. ○ Assessment Criteria <ol style="list-style-type: none"> 1. 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. 2. Identify and explain basic and major components of the shielded metal arc welding equipment in terms of manufacturer's requirements and standards. 3. Identify parts and components correctly and the implications for incorrect identification are explained. 4. Explain terms and definitions used with welding terminology as recorded in international welding standards. Parts include: Suitable power source, earth clamp, electrode holder and welding cable ○ Specific Outcome 2 Select, set up and conduct pre-operational checks of shielded metal arc welding equipment. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identify, verify and selection shielded metal arc welding equipment as specified on welding procedure specification 2. Identify and rectify hazards relating to welding process in accordance with standard work site practices. 3. Carry out pre-operational checks in accordance with manufacturer's specifications. Resources to include: manufacturer's operational manual, worksite practices and safety and environmental issues. ○ Specific Outcome 3 Prepare work-pieces prior to welding. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Prepare work pieces prior to welding as specified on drawing and worksite procedures. 2. Identify dimensions and alignment as specified on drawing. 3. Tack welds work-piece in position as per drawing specifications. 4. Adhere to safety precautions. 5. Inspect work-piece prior to welding. Resources include - Worksite procedures, tools, equipment, safety requirements, and materials. 	<p>information visually</p> <ul style="list-style-type: none"> ○ Practical demonstration ○ Build Model
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	<ul style="list-style-type: none"> ○ Specific Outcome 4 Weld work-pieces. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Select welding electrodes as specified on welding procedure specification. 2. Weld work-piece in position. 3. Adhere to safety precautions during welding process. 4. Clean work-piece after welding as per worksite practices. <p><u>Scope:</u> Material type to be used: May be chosen 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 - 1,6mm. <u>Resources include:</u> Welding equipment, tools, protective clothing and equipment, welding procedure specification, materials, etc. Welding positions include: Butt and fillet welds in (<u>flat position:</u> square groove butt joint vee groove joint, lap joint, tee and conner joints) (<u>horizontal position:</u> groove joint, lap joint, tee joint)</p> <ul style="list-style-type: none"> ○ Specific Outcome 5 Inspect welded work piece for defects in compliance with drawing specifications ○ Assessment Criteria <ol style="list-style-type: none"> 1. Remove all residues slag and spatter as specified in cleaning procedure. 2. Welded work-piece conforms to job specifications 3. Inspection methods and procedures selected are conducive to specifications. ○ Specific Outcome 6 Care for and store welding consumables and equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Care for tools and equipment as per manufacturer's specifications and stored as per worksite practices. 2. Store tools and equipment to conform to worksite practices. 3. Store welding consumables in accordance to worksite practices. 	
Week 10	<ul style="list-style-type: none"> • Pen and paper test 25% of term mark for basic Welding (Test may be given in any week as per school assessment plan) • Reflect and review 	

Assessment

Formal Assessment Task 1:

Activity 1

Demonstration:

(25 marks) Assess using a memorandum and rubric

Activity 2

Model:

Learners make a simple model using welding techniques

(50 Marks) Assess using a rubric

Note:

The following skills could be assessed in all demonstrations or models :

- *Measuring, Cutting, Welding, Grinding, Drilling , Application of safety aspects*

Activity 3

Pen and Paper Test: (25 marks) Assess using a memorandum.

- Learners respond to questions

YEAR 3- ANNUAL TEACHING PLAN

TERM 2

WK	CONTENT	ACTIVITIES
<p>Week 1</p>	<p>Learners must be taught how to: Exit Level Outcome 1: Select, use and care for engineering hand tools</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering hand tools ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identify, explain and use all the engineering hand tools; e.g. hand files, spanners, socket sets, specialised sockets, impact sockets, torque wrench, Allen keys, screwdrivers, pliers, clamps, tin snips, hacksaws, chisels, metal shears, hammers, beating files, dollies, spoons, pullers, mallets, bench stakes, files, scrapers, hole punches, anvils and riveters spray guns, sanding blocks, body filler mixing and application tools, 2. Give clear explanations and appropriate examples 3. Refer to appropriate literature when giving explanation 4. Demonstrate the ability to apply the various engineering hand tools in their different applications ○ Specific Outcome 2 Care for and maintain engineering hand tools. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Carry out maintenance of engineering hand tools in accordance with the applicable requirements and workplace procedures 2. Respond correctly to task related questions to confirm understanding 3. Recognise and report problems, changes and/or malfunctions while working with engineering hand tools ○ Specific Outcome 3 Work safely with due care for self, fellow workers, equipment, materials and the environment. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and demonstrate safe working practises 2. Demonstrate an understanding of SHE procedures <p>Exit Level Outcome 2: Select, use and care for engineering measuring equipment</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering measuring equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and discuss basic units of measure, symbols and derived units of measure 2. Use measuring equipment as recommended by the manufacturer to meet job/task requirements 3. Take measurements and record 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration

	<p>4. Identify unsafe/faulty measuring equipment and take corrective action taken</p> <p>5. Clean, service, maintain and store measuring equipment</p> <ul style="list-style-type: none"> ○ Specific Outcome 2 Care for and maintain measuring equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and discuss basic units of measure, symbols and derived units of measure. 2. Select and use engineering measuring equipment <p>Exit Level Outcome 8: 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"> ○ Specific Outcome 1 Estimate, measure and calculate physical quantities to solve problems in practical situations. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identify and correctly read scales on the measuring instruments 2. Identify the appropriate instrument to measure a particular quantity. 3. Carry out calculations correctly 4. Explain and demonstrate appropriate units measurement and calculation. ○ Specific Outcome 2 Explore transformations of two-dimensional geometric figures ○ Assessment Criteria <ol style="list-style-type: none"> 1. Describe and identify properties of symmetrical shapes 2. Explain and identify concepts of lines of symmetry in 2-dimensional figures using paper folding and reflections in the lines of symmetry. 3. Explain and identify concepts of transformation in terms of reflections, translations and rotations using concrete materials. 	
<p>Weeks 2 and 3</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 3: Select, use and care for engineering power tools</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering power tools <p>Assessment Criteria</p> <ol style="list-style-type: none"> 1. Use appropriate power tools as recommended by the manufacturer to meet job/task requirements 2. Identify and take corrective action with regards to unsafe/faulty power tools 3. Clean, service, maintained and stored power tools 4. Maintain a clean and tidy work environment 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually

	<p>5. Explain and discuss consequences of incorrectly using power tools,</p> <p>6. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws)</p> <ul style="list-style-type: none"> ○ Specific Outcome 2 Check on power supply connections to equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and discuss risks and hazards related to the various power supply sources 2. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws) ○ Specific Outcome 3 Recognise and report problems, changes and/or malfunctions while working ○ Assessment Criteria <ol style="list-style-type: none"> 1. Report problems timorously to appropriate personnel 2. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws) ○ Specific Outcome 4 Work safely with due care for self, fellow workers, machines, equipment, materials and environment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Take correct safety precautions against bad connections, damaged air and hydraulic hoses, damaged electrical cables, cracked discs and worn or damaged blades. 2. Use appropriate personal protective equipment when using power tools 3. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws) 	<ul style="list-style-type: none"> ○ Practical demonstration
<p>Week 4 to 9</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 6: Identify and select material to specification</p> <ul style="list-style-type: none"> ○ Specific Outcome 2 Identify materials to specification. 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information

<ul style="list-style-type: none"> ○ Assessment Criteria 1. Identification of materials in accordance with material specification sheet as included in work instructions. 2. Demonstrate all safety precautions in relation to work site practices and procedures 3. Identify materials marked with colour code or identification numbers. Materials to be identified, limited to mild steel, and carbon steels Identification methods visually with the aid of de-coding systems and mechanical processes <p>Exit Level Outcome 9: Weld carbon steel work-pieces using the shielded metal arc welding process in the down-hand position.</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Describe the shielded metal arc welding process. ○ Assessment Criteria 1. 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. 2. Identify and explain basic and major components of the shielded metal arc welding equipment in terms of manufacturer's requirements and standards. 3. Identify parts and components correctly and the implications for incorrect identification are explained. 4. Explain terms and definitions used with welding terminology as recorded in international welding standards. Parts include: Suitable power source, earth clamp, electrode holder and welding cable ○ Specific Outcome 2 Select, set up and conduct pre-operational checks of shielded metal arc welding equipment. ○ Assessment Criteria 1. Identify, verify and selection shielded metal arc welding equipment as specified on welding procedure specification 2. Identify and rectify hazards relating to welding process in accordance with standard work site practices. 3. Carry out pre-operational checks in accordance with manufacturer's specifications. Resources to include: manufacturer's operational manual, worksite practices and safety and environ-mental issues. ○ Specific Outcome 3 Prepare work-pieces prior to welding. ○ Assessment Criteria 1. Prepare work pieces prior to welding as specified on drawing and worksite procedures. 2. Identify dimensions and alignment as specified on drawing. 3. Tack welds work-piece in position as per drawing specifications. 4. Adhere to safety precautions. 	<ul style="list-style-type: none"> ○ Written presentations ○ Present information visually ○ Practical demonstration ○ Build Model
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	<p>5. Inspect work-piece prior to welding. Resources include - Worksite procedures, tools, equipment, safety requirements, and materials.</p> <ul style="list-style-type: none"> ○ Specific Outcome 4 Weld work-pieces. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Select welding electrodes as specified on welding procedure specification. 2. Weld work-piece in position. 3. Adhere to safety precautions during welding process. 4. Clean work-piece after welding as per worksite practices. <p><u>Scope:</u> Material type to be used: May be chosen 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 - 1,6mm. <u>Resources include:</u> Welding equipment, tools, protective clothing and equipment, welding procedure specification, materials, etc. Welding positions include: Butt and fillet welds in (<u>flat position:</u> square groove butt joint vee groove joint, lap joint, tee and conner joints) (<u>horizontal position:</u> groove joint, lap joint, tee joint)</p> <ul style="list-style-type: none"> ○ Specific Outcome 5 Inspect welded work piece for defects in compliance with drawing specifications ○ Assessment Criteria <ol style="list-style-type: none"> 1. Remove all residues slag and spatter as specified in cleaning procedure. 2. Welded work-piece conforms to job specifications 3. Inspection methods and procedures selected are conducive to specifications. ○ Specific Outcome 6 Care for and store welding consumables and equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Care for tools and equipment as per manufacturer's specifications and stored as per worksite practices. 2. Store tools and equipment to conform to worksite practices. 3. Store welding consumables in accordance to worksite practices. 	
Week 10	<ul style="list-style-type: none"> ● Pen and paper test 25% of term mark for basic Welding (Test may be given in any week as per school assessment plan) ● Reflect and review 	

Assessment

Formal Assessment Task 2:

Activity 1

Demonstration:

(25 marks) Assess using a memorandum and rubric

Activity 2

Model:

Learners make a simple model using welding techniques

(50 Marks) Assess using a rubric

Note:

The following skills could be assessed in all demonstrations or models :

- *Measuring, Cutting, Welding, Grinding, Drilling , Application of safety aspects*

Activity 3

Pen and Paper Test: (25 marks) Assess using a memorandum.

- Learners respond to questions

WK	CONTENT	ACTIVITIES
<p>Week 1</p>	<p>Learners must be taught how to: Exit Level Outcome 1: Select, use and care for engineering hand tools</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering hand tools ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identify, explain and use all the engineering hand tools; e.g. hand files, spanners, socket sets, specialised sockets, impact sockets, torque wrench, Allen keys, screwdrivers, pliers, clamps, tin snips, hacksaws, chisels, metal shears, hammers, beating files, dollies, spoons, pullers, mallets, bench stakes, files, scrapers, hole punches, anvils and riveters spray guns, sanding blocks, body filler mixing and application tools, 2. Give clear explanations and appropriate examples 3. Refer to appropriate literature when giving explanation 4. Demonstrate the ability to apply the various engineering hand tools in their different applications ○ Specific Outcome 2 Care for and maintain engineering hand tools. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Carry out maintenance of engineering hand tools in accordance with the applicable requirements and workplace procedures 2. Respond correctly to task related questions to confirm understanding 3. Recognise and report problems, changes and/or malfunctions while working with engineering hand tools ○ Specific Outcome 3 Work safely with due care for self, fellow workers, equipment, materials and the environment. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and demonstrate safe working practises 2. Demonstrate an understanding of SHE procedures <p>Exit Level Outcome 2: Select, use and care for engineering measuring equipment</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering measuring equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and discuss basic units of measure, symbols and derived units of measure 2. Use measuring equipment as recommended by the manufacturer to meet job/task requirements 3. Take measurements and record 4. Identify unsafe/faulty measuring equipment and take corrective action taken 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration

	<p>5. Clean, service, maintain and store measuring equipment</p> <ul style="list-style-type: none"> ○ Specific Outcome 2 Care for and maintain measuring equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and discuss basic units of measure, symbols and derived units of measure. 2. Select and use engineering measuring equipment <p>Exit Level Outcome 8: 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"> ○ Specific Outcome 1 Estimate, measure and calculate physical quantities to solve problems in practical situations. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identify and correctly read scales on the measuring instruments 2. Identify the appropriate instrument to measure a particular quantity. 3. Carry out calculations correctly 4. Explain and demonstrate appropriate units measurement and calculation. ○ Specific Outcome 2 Explore transformations of two-dimensional geometric figures ○ Assessment Criteria <ol style="list-style-type: none"> 1. Describe and identify properties of symmetrical shapes 2. Explain and identify concepts of lines of symmetry in 2-dimensional figures using paper folding and reflections in the lines of symmetry. 3. Explain and identify concepts of transformation in terms of reflections, translations and rotations using concrete materials. 	
<p>Weeks 2 and 3</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 3: Select, use and care for engineering power tools</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering power tools <p>Assessment Criteria</p> <ol style="list-style-type: none"> 1. Use appropriate power tools as recommended by the manufacturer to meet job/task requirements 2. Identify and take corrective action with regards to unsafe/faulty power tools 3. Clean, service, maintained and stored power tools 4. Maintain a clean and tidy work environment 5. Explain and discuss consequences of incorrectly using power tools, 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration

	<p>6. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws)</p> <ul style="list-style-type: none"> ○ Specific Outcome 2 Check on power supply connections to equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and discuss risks and hazards related to the various power supply sources 2. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws) ○ Specific Outcome 3 Recognise and report problems, changes and/or malfunctions while working ○ Assessment Criteria <ol style="list-style-type: none"> 1. Report problems timorously to appropriate personnel 2. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws) ○ Specific Outcome 4 Work safely with due care for self, fellow workers, machines, equipment, materials and environment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Take correct safety precautions against bad connections, damaged air and hydraulic hoses, damaged electrical cables, cracked discs and worn or damaged blades. 2. Use appropriate personal protective equipment when using power tools 3. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws) 	
<p>Week 4 to 9</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 6: Identify and select material to specification</p> <ul style="list-style-type: none"> ○ Specific Outcome 2 Identify materials to specification. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identification of materials in accordance with material specification sheet as included in work instructions. 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations

	<p>2. Demonstrate all safety precautions in relation to work site practices and procedures</p> <p>3. Identify materials marked with colour code or identification numbers. Materials to be identified, limited to mild steel, and carbon steels Identification methods visually with the aid of de-coding systems and mechanical processes</p> <p>Exit Level Outcome 14: Use mathematics to investigate and monitor the financial aspects of personal community life.</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Use mathematics to plan and control projected budgets and income and expenditure. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain projected income and expenditure realistically. 2. Carry out calculations using a calculator efficiently and correctly, and solutions obtained are verified in terms of the context. <p>Exit Level Outcome 12: Weld carbon steel work pieces using the gas metal arc welding process in the down-hand position</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Describe the gas metal arc welding process and related equipment. ○ Assessment Criteria <ol style="list-style-type: none"> 1. 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. 2. Explain and identify basic components of the gas metal arc welding equipment and the function and purpose is correct in terms of manufacturer's requirements and standards. 3. Identify and explain parts and equipment and the implications of the incorrect identification of parts. 4. Explain terms and use definitions consistent with generally accepted welding terminology as recorded in international welding standards; 5. Suitable power source, wire-feeder, shielding gas, regulator, flow-meter, materials as specified on drawings and weld filler material, according to welding procedure specification ○ Specific Outcome 2 Select, assemble and conduct pre-operational checks of gas metal arc welding equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Select welding filler material as specified on welding procedure specification. 2. Demonstrate work-piece welded in position. 3. Demonstrate safety precautions during welding process. 	<ul style="list-style-type: none"> ○ Present information visually ○ Practical demonstration ○ Build Model
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	<ol style="list-style-type: none"> 4. Explain and demonstrate that welding parameters are established to an approved welding procedure specification (WPS). 5. Demonstrate that work-piece are cleaned after welding as per worksite practices. <ul style="list-style-type: none"> ○ Specific Outcome 3 Prepare workpieces prior to welding ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and prepare work-pieces prior to welding as specified on drawing and worksite practices. 2. Identify dimensions and check alignment as specified on drawing. 3. Demonstrate tacked work-piece welded in position as per drawing specifications. 4. Demonstrate all safety precautions are adhered to. 5. Inspect work-piece prior to welding. ○ Specific Outcome 4 Weld workpieces ○ Assessment Criteria <ol style="list-style-type: none"> 1. Select welding filler material as specified on welding procedure specification. 2. Demonstrate work-piece welded in position. 3. Demonstrate safety precautions during welding process 4. Explain and demonstrate that welding parameters are established to an approved welding procedure specification (WPS). 5. Demonstrate that work-piece are cleaned after welding as per worksite practices. ○ Specific Outcome 5 Inspect welded workpiece for defects. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Remove all welding spatter as specified in cleaning procedure. 2. Check that welded work-piece conforms to job specifications. 3. Inspection methods and procedures selected are conducive to specifications. ○ Specific Outcome 6 Care for and store welding consumables and equipment. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Demonstrate and explain care of tools and equipment as per vendor specifications 2. Demonstrate and explain storage of tools and equipment to conform to worksite practices. 3. Demonstrate and explain storage of welding consumables in accordance with worksite practices. 	
Week 10	<ul style="list-style-type: none"> • Pen and paper test 25% of term mark for basic Welding (Test may be given in any week as per school assessment plan) • Reflect and review 	

Assessment

Formal Assessment Task 3:

Activity 1

Demonstration:

(25 marks) Assess using a memorandum and rubric

Activity 2

Model:

Learners make a simple model using welding techniques

(50 Marks) Assess using a rubric

Note:

The following skills could be assessed in all demonstrations or models :

- *Measuring, Cutting, Welding, Grinding, Drilling , Application of safety aspects*

Activity 3

Pen and Paper Test: (25 marks) Assess using a memorandum.

- Learners respond to questions

YEAR 3- ANNUAL TEACHING PLAN

TERM 4

WK	CONTENT	ACTIVITIES
<p>Week 1</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 1: Select, use and care for engineering hand tools</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering hand tools ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identify, explain and use all the engineering hand tools; e.g. hand files, spanners, socket sets, specialised sockets, impact sockets, torque wrench, Allen keys, screwdrivers, pliers, clamps, tin snips, hacksaws, chisels, metal shears, hammers, beating files, dollies, spoons, pullers, mallets, bench stakes, files, scrapers, hole punches, anvils and riveters spray guns, sanding blocks, body filler mixing and application tools, 2. Give clear explanations and appropriate examples 3. Refer to appropriate literature when giving explanation 4. Demonstrate the ability to apply the various engineering hand tools in their different applications ○ Specific Outcome 2 Care for and maintain engineering hand tools. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Carry out maintenance of engineering hand tools in accordance with the applicable requirements and workplace procedures 2. Respond correctly to task related questions to confirm understanding 3. Recognise and report problems, changes and/or malfunctions while working with engineering hand tools ○ Specific Outcome 3 Work safely with due care for self, fellow workers, equipment, materials and the environment. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and demonstrate safe working practises 2. Demonstrate an understanding of SHE procedures <p>Exit Level Outcome 2: Select, use and care for engineering measuring equipment</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering measuring equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and discuss basic units of measure, symbols and derived units of measure 2. Use measuring equipment as recommended by the manufacturer to meet job/task requirements 3. Take measurements and record 4. Identify unsafe/faulty measuring equipment and take corrective action taken 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration

	<p>5. Clean, service, maintain and store measuring equipment</p> <ul style="list-style-type: none"> ○ Specific Outcome 2 Care for and maintain measuring equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and discuss basic units of measure, symbols and derived units of measure. 2. Select and use engineering measuring equipment <p>Exit Level Outcome 8: 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"> ○ Specific Outcome 1 Estimate, measure and calculate physical quantities to solve problems in practical situations. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identify and correctly read scales on the measuring instruments 2. Identify the appropriate instrument to measure a particular quantity. 3. Carry out calculations correctly 4. Explain and demonstrate appropriate units measurement and calculation. ○ Specific Outcome 2 Explore transformations of two-dimensional geometric figures ○ Assessment Criteria <ol style="list-style-type: none"> 1. Describe and identify properties of symmetrical shapes 2. Explain and identify concepts of lines of symmetry in 2-dimensional figures using paper folding and reflections in the lines of symmetry. 3. Explain and identify concepts of transformation in terms of reflections, translations and rotations using concrete materials. 	
<p>Week 2</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 4: Apply work site practices</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Establish the principles of personal and job safety on the worksite. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identify hazards in relation to worksite in accordance with the OHS Act; equipment, electrical machinery, chemicals, fire, gas, fumes, compressed air, noise and product 2. Identify personal hazards in relation to worksite; clothing, hair, footwear, jewellery, lifting, handling, and occupational overuse syndrome. 3. Identify procedures in relation to avoidance of accidents; equipment, machinery, electrical, chemical, fire, fumes, compressed air, gas, protective clothing, storage as laid down in policy or procedure. 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration

	<ol style="list-style-type: none"> 4. Identify procedures and principles of relevant acts and regulations relating to safety, health and welfare on worksite. 5. Explain procedures in the event of accident, fire emergency as in policy or procedure <ul style="list-style-type: none"> ○ Specific Outcome 2 Demonstrate safe working practices on the worksite. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Demonstrate safe working practices in the use of machinery as specified in the manufacturer's operational manual and instructions; fences, guards, safety devises, operation and isolation techniques 2. Demonstrate safe working practices which ensure personal safety 3. Explain and demonstrate the storage of hazardous materials as specified by manufacturer; chemicals, gas, compressed air, flammable materials, lubricants, paints, sealants, cleaning fluids, and waste materials. 4. Identify warning signs in relation to hazards. 5. Work areas are kept clean and free of debris; walkways, floors, workbenches, platforms, and conveyers. 6. Use equipment as specified by manufacturer's or standard procedure; electrical, mechanical, fluid, and radiation 7. Explain and demonstrate procedures in the event of fire, accident, chemical spillage, and emergency as laid down by regulation and specified on worksite. 8. Explain how worksite practices comply with Acts, Regulations, and by-laws relating to health, safety and welfare. (OHS Act, Local authority by-laws.) 9. Explain and demonstrate emergency shutdown procedures ○ Specific Outcome 3 Adhere and conform to store procedures and material handling ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and demonstrate store procedures according to worksite practice. 2. Explain and demonstrate correct safety procedures to storing materials 	
<p>Week 3</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 3: Select, use and care for engineering power tools</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering power tools Assessment Criteria <ol style="list-style-type: none"> 1. Use appropriate power tools as recommended by the manufacturer to meet job/task requirements 2. Identify and take corrective action with regards to unsafe/faulty power tools 3. Clean, service, maintained and stored power tools 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information

	<ol style="list-style-type: none"> 4. Maintain a clean and tidy work environment 5. Explain and discuss consequences of incorrectly using power tools, 6. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws) <ul style="list-style-type: none"> ○ Specific Outcome 2 Check on power supply connections to equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and discuss risks and hazards related to the various power supply sources 2. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws) ○ Specific Outcome 3 Recognise and report problems, changes and/or malfunctions while working ○ Assessment Criteria <ol style="list-style-type: none"> 1. Report problems timorously to appropriate personnel 2. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws) ○ Specific Outcome 4 Work safely with due care for self, fellow workers, machines, equipment, materials and environment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Take correct safety precautions against bad connections, damaged air and hydraulic hoses, damaged electrical cables, cracked discs and worn or damaged blades. 2. Use appropriate personal protective equipment when using power tools 3. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws) 	<p>visually</p> <ul style="list-style-type: none"> ○ Practical demonstration
<p>Week 4 to 9</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 6: Identify and select material to specification</p> <ul style="list-style-type: none"> ○ Specific Outcome 2 Identify materials to specification. 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources

<ul style="list-style-type: none"> ○ Assessment Criteria 1. Identification of materials in accordance with material specification sheet as included in work instructions. 2. Demonstrate all safety precautions in relation to work site practices and procedures 3. Identify materials marked with colour code or identification numbers. Materials to be identified, limited to mild steel, and carbon steels Identification methods visually with the aid of de-coding systems and mechanical processes <p>Exit Level Outcome 14: Use mathematics to investigate and monitor the financial aspects of personal community life.</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Use mathematics to plan and control projected budgets and income and expenditure. ○ Assessment Criteria 1. Explain projected income and expenditure realistically. 2. Carry out calculations using a calculator efficiently and correctly, and solutions obtained are verified in terms of the context. <p>Exit Level Outcome 12: Weld carbon steel work pieces using the gas metal arc welding process in the down-hand position</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Describe the gas metal arc welding process and related equipment. ○ Assessment Criteria 1. 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. 2. Explain and identify basic components of the gas metal arc welding equipment and the function and purpose is correct in terms of manufacturer's requirements and standards. 3. Identify and explain parts and equipment and the implications of the incorrect identification of parts. 4. Explain terms and use definitions consistent with generally accepted welding terminology as recorded in international welding standards; 5. Suitable power source, wire-feeder, shielding gas, regulator, flow-meter, materials as specified on drawings and weld filler material, according to welding procedure specification ○ Specific Outcome 2 Select, assemble and conduct pre-operational checks of gas metal arc welding equipment ○ Assessment Criteria 1. Select welding filler material as specified on welding procedure specification. 	<ul style="list-style-type: none"> ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration ○ Build Model
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| <ul style="list-style-type: none"> 2. Demonstrate work-piece welded in position. 3. Demonstrate safety precautions during welding process. 4. Explain and demonstrate that welding parameters are established to an approved welding procedure specification (WPS). 5. Demonstrate that work-piece are cleaned after welding as per worksite practices. <ul style="list-style-type: none"> ○ Specific Outcome 3
Prepare workpieces prior to welding <ul style="list-style-type: none"> ○ Assessment Criteria <ul style="list-style-type: none"> 1. Explain and prepare work-pieces prior to welding as specified on drawing and worksite practices. 2. Identify dimensions and check alignment as specified on drawing. 3. Demonstrate tacked work-piece welded in position as per drawing specifications. 4. Demonstrate all safety precautions are adhered to. 5. Inspect work-piece prior to welding. <ul style="list-style-type: none"> ○ Specific Outcome 4
Weld workpieces <ul style="list-style-type: none"> ○ Assessment Criteria <ul style="list-style-type: none"> 1. Select welding filler material as specified on welding procedure specification. 2. Demonstrate work-piece welded in position. 3. Demonstrate safety precautions during welding process 4. Explain and demonstrate that welding parameters are established to an approved welding procedure specification (WPS). 5. Demonstrate that work-piece are cleaned after welding as per worksite practices. <ul style="list-style-type: none"> ○ Specific Outcome 5
Inspect welded workpiece for defects. <ul style="list-style-type: none"> ○ Assessment Criteria <ul style="list-style-type: none"> 1. Remove all welding spatter as specified in cleaning procedure. 2. Check that welded work-piece conforms to job specifications. 3. Inspection methods and procedures selected are conducive to specifications. <ul style="list-style-type: none"> ○ Specific Outcome 6
Care for and store welding consumables and equipment. <ul style="list-style-type: none"> ○ Assessment Criteria <ul style="list-style-type: none"> 1. Demonstrate and explain care of tools and equipment as per vendor specifications 2. Demonstrate and explain storage of tools and equipment to conform to worksite practices. 3. Demonstrate and explain storage of welding consumables in accordance with worksite practices. | |
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Week 10	<ul style="list-style-type: none"> • Pen and paper test 25% of term mark for basic Welding (Test may be given in any week as per school assessment plan) • Reflect and review 	
<p>Assessment</p> <p>Formal Assessment Task 4:</p> <p>Activity 1 Demonstration: (25 marks) Assess using a memorandum and rubric</p> <p>Activity 2 Model: Learners make a simple model using welding techniques (50 Marks) Assess using a rubric</p> <p>Note: <i>The following skills could be assessed in all demonstrations or models :</i></p> <ul style="list-style-type: none"> ○ <i>Measuring, Cutting, Welding, Grinding, Drilling , Application of safety aspects</i> <p>Activity 3 Pen and Paper Test: (25 marks) Assess using a memorandum.</p> <ul style="list-style-type: none"> ○ Learners respond to questions 		

YEAR 4- ANNUAL TEACHING PLAN

TERM 1

WK	CONTENT	ACTIVITIES
<p>Week 1</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 1: Select, use and care for engineering hand tools</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering hand tools ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identify, explain and use all the engineering hand tools; e.g. hand files, spanners, socket sets, specialised sockets, impact sockets, torque wrench, Allen keys, screwdrivers, pliers, clamps, tin snips, hacksaws, chisels, metal shears, hammers, beating files, dollies, spoons, pullers, mallets, bench stakes, files, scrapers, hole punches, anvils and riveters spray guns, sanding blocks, body filler mixing and application tools, 2. Give clear explanations and appropriate examples 3. Refer to appropriate literature when giving explanation 4. Demonstrate the ability to apply the various engineering hand tools in their different applications ○ Specific Outcome 2 Care for and maintain engineering hand tools. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Carry out maintenance of engineering hand tools in accordance with the applicable requirements and workplace procedures 2. Respond correctly to task related questions to confirm understanding 3. Recognise and report problems, changes and/or malfunctions while working with engineering hand tools ○ Specific Outcome 3 Work safely with due care for self, fellow workers, equipment, materials and the environment. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and demonstrate safe working practises 2. Demonstrate an understanding of SHE procedures <p>Exit Level Outcome 2: Select, use and care for engineering measuring equipment</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering measuring equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and discuss basic units of measure, symbols and derived units of measure 2. Use measuring equipment as recommended by the manufacturer to meet job/task requirements 3. Take measurements and record 4. Identify unsafe/faulty measuring equipment and take corrective action taken 5. Clean, service, maintain and store measuring equipment 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration

	<ul style="list-style-type: none"> ○ Specific Outcome 2 Care for and maintain measuring equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and discuss basic units of measure, symbols and derived units of measure. 2. Select and use engineering measuring equipment <p>Exit Level Outcome 8: 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"> ○ Specific Outcome 1 Estimate, measure and calculate physical quantities to solve problems in practical situations. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identify and correctly read scales on the measuring instruments 2. Identify the appropriate instrument to measure a particular quantity. 3. Carry out calculations correctly 4. Explain and demonstrate appropriate units measurement and calculation. ○ Specific Outcome 2 Explore transformations of two-dimensional geometric figures ○ Assessment Criteria <ol style="list-style-type: none"> 1. Describe and identify properties of symmetrical shapes 2. Explain and identify concepts of lines of symmetry in 2-dimensional figures using paper folding and reflections in the lines of symmetry. 3. Explain and identify concepts of transformation in terms of reflections, translations and rotations using concrete materials. 	
<p>Week 2</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 4: Apply work site practices</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Establish the principles of personal and job safety on the worksite. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identify hazards in relation to worksite in accordance with the OHS Act; equipment, electrical machinery, chemicals, fire, gas, fumes, compressed air, noise and product 2. Identify personal hazards in relation to worksite; clothing, hair, footwear, jewellery, lifting, handling, and occupational overuse syndrome. 3. Identify procedures in relation to avoidance of accidents; equipment, machinery, electrical, chemical, fire, fumes, compressed air, gas, protective clothing, storage as laid down in policy or procedure. 4. Identify procedures and principles of relevant acts and regulations relating to safety, health and welfare on worksite. 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration

	<p>5. Explain procedures in the event of accident, fire emergency as in policy or procedure</p> <ul style="list-style-type: none"> ○ Specific Outcome 2 Demonstrate safe working practices on the worksite. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Demonstrate safe working practices in the use of machinery as specified in the manufacturer's operational manual and instructions; fences, guards, safety devices, operation and isolation techniques 2. Demonstrate safe working practices which ensure personal safety 3. Explain and demonstrate the storage of hazardous materials as specified by manufacturer; chemicals, gas, compressed air, flammable materials, lubricants, paints, sealants, cleaning fluids, and waste materials. 4. Identify warning signs in relation to hazards. 5. Work areas are kept clean and free of debris; walkways, floors, workbenches, platforms, and conveyers. 6. Use equipment as specified by manufacturer's or standard procedure; electrical, mechanical, fluid, and radiation 7. Explain and demonstrate procedures in the event of fire, accident, chemical spillage, and emergency as laid down by regulation and specified on worksite. 8. Explain how worksite practices comply with Acts, Regulations, and by-laws relating to health, safety and welfare. (OHS Act, Local authority by-laws.) 9. Explain and demonstrate emergency shutdown procedures ○ Specific Outcome 3 Adhere and conform to store procedures and material handling ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and demonstrate store procedures according to worksite practice. 2. Explain and demonstrate correct safety procedures to storing materials 	
<p>Week 3</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 3: Select, use and care for engineering power tools</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering power tools Assessment Criteria <ol style="list-style-type: none"> 1. Use appropriate power tools as recommended by the manufacturer to meet job/task requirements 2. Identify and take corrective action with regards to unsafe/faulty power tools 3. Clean, service, maintained and stored power tools 4. Maintain a clean and tidy work environment 5. Explain and discuss consequences of incorrectly using power tools, 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration

	<p>6. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws)</p> <ul style="list-style-type: none"> ○ Specific Outcome 2 Check on power supply connections to equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and discuss risks and hazards related to the various power supply sources 2. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws) ○ Specific Outcome 3 Recognise and report problems, changes and/or malfunctions while working ○ Assessment Criteria <ol style="list-style-type: none"> 1. Report problems timorously to appropriate personnel 2. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws) ○ Specific Outcome 4 Work safely with due care for self, fellow workers, machines, equipment, materials and environment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Take correct safety precautions against bad connections, damaged air and hydraulic hoses, damaged electrical cables, cracked discs and worn or damaged blades. 2. Use appropriate personal protective equipment when using power tools 3. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws) 	
<p>Week 4</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 7: Use welding definitions and symbols</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Know the basics of welded joints and their terminology. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Describe and explain definitions used in the welding industry in accordance with AWS standards and practices. Definitions limited to those as prescribed in the AW Standards and practices. 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations

	<p>2. Explain and describe different joints and their characteristics.</p> <p>3. Explain and describe the characteristics of welds, types of joint preparation, weld profile and surface finish</p> <ul style="list-style-type: none"> ○ Specific Outcome 2 Identify and apply welding symbols used by industry. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and describe weld symbols used in the industry in accordance with AWS instruction manual. Welding symbols is limited to those as prescribed in the AW Standards and practices ○ Specific Outcome 3 Sketch and describe welding symbols used in the industry. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Describe and sketch weld symbols in accordance with AWS and work instruction sheet. Sketches of weld symbols can be done on free hand sketching or formal drawing 2. Identify and interpret welding symbols. 	<ul style="list-style-type: none"> ○ Present information visually ○ Practical demonstration
<p>Week 5 to 9</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 6: Identify and select material to specification</p> <ul style="list-style-type: none"> ○ Specific Outcome 2 Identify materials to specification. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identification of materials in accordance with material specification sheet as included in work instructions. 2. Demonstrate all safety precautions in relation to work site practices and procedures 3. Identify materials marked with colour code or identification numbers. Materials to be identified, limited to mild steel, and carbon steels Identification methods visually with the aid of de-coding systems and mechanical processes <p>Exit Level Outcome 14: Use mathematics to investigate and monitor the financial aspects of personal community life.</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Use mathematics to plan and control projected budgets and income and expenditure. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain projected income and expenditure realistically. 2. Carry out calculations using a calculator efficiently and correctly, and solutions obtained are verified in terms of the context. 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration ○ Build Model

Exit Level Outcome 12:

Weld carbon steel work pieces using the gas metal arc welding process in the down-hand position

○ **Specific Outcome 1**

Describe the gas metal arc welding process and related equipment.

○ **Assessment Criteria**

1. 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.
2. Explain and identify basic components of the gas metal arc welding equipment and the function and purpose is correct in terms of manufacturer's requirements and standards.
3. Identify and explain parts and equipment and the implications of the incorrect identification of parts.
4. Explain terms and use definitions consistent with generally accepted welding terminology as recorded in international welding standards;
5. Suitable power source, wire-feeder, shielding gas, regulator, flow-meter, materials as specified on drawings and weld filler material, according to welding procedure specification

○ **Specific Outcome 2**

Select, assemble and conduct pre-operational checks of gas metal arc welding equipment

○ **Assessment Criteria**

1. Select welding filler material as specified on welding procedure specification.
2. Demonstrate work-piece welded in position.
3. Demonstrate safety precautions during welding process.
4. Explain and demonstrate that welding parameters are established to an approved welding procedure specification (WPS).
5. Demonstrate that work-piece are cleaned after welding as per worksite practices.

○ **Specific Outcome 3**

Prepare workpieces prior to welding

○ **Assessment Criteria**

1. Explain and prepare work-pieces prior to welding as specified on drawing and worksite practices.
2. Identify dimensions and check alignment as specified on drawing.
3. Demonstrate tacked work-piece welded in position as per drawing specifications.
4. Demonstrate all safety precautions are adhered to.
5. Inspect work-piece prior to welding.

○ **Specific Outcome 4**

Weld workpieces

	<ul style="list-style-type: none"> ○ Assessment Criteria <ol style="list-style-type: none"> 1. Select welding filler material as specified on welding procedure specification. 2. Demonstrate work-piece welded in position. 3. Demonstrate safety precautions during welding process 4. Explain and demonstrate that welding parameters are established to an approved welding procedure specification (WPS). 5. Demonstrate that work-piece are cleaned after welding as per worksite practices. ○ Specific Outcome 5 Inspect welded workpiece for defects. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Remove all welding spatter as specified in cleaning procedure. 2. Check that welded work-piece conforms to job specifications. 3. Inspection methods and procedures selected are conducive to specifications. ○ Specific Outcome 6 Care for and store welding consumables and equipment. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Demonstrate and explain care of tools and equipment as per vendor specifications 2. Demonstrate and explain storage of tools and equipment to conform to worksite practices. 3. Demonstrate and explain storage of welding consumables in accordance with worksite practices. 	
<p>Week 10</p>	<ul style="list-style-type: none"> • Pen and paper test 25% of term mark for basic Welding (Test may be given in any week as per school assessment plan) • Reflect and review 	

<p>Assessment</p> <p>Formal Assessment Task 1:</p> <p>Activity 1 Demonstration: (25 marks) Assess using a memorandum and rubric</p> <p>Activity 2 Model: Learners make a simple model using welding techniques (50 Marks) Assess using a rubric</p> <p>Note: <i>The following skills could be assessed in all demonstrations or models :</i></p> <ul style="list-style-type: none"> ○ Measuring, Cutting, Welding, Grinding, Drilling , Application of safety aspects <p>Activity 3 Pen and Paper Test: (25 marks) Assess using a memorandum.</p> <ul style="list-style-type: none"> ○ Learners respond to questions
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YEAR 4- ANNUAL TEACHING PLAN

TERM 2

WK	CONTENT	ACTIVITIES
<p>Week 1</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 5: Describe the welding industry's composition, its productivity requirements and communication techniques</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Identify and interpret organisational structures, and personal functions within the company or business ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and demonstrate correct structure and person's roles, and the consequences of incorrect identification, with reference to company policy and requirements. 2. Explain persons and their position in relation to the organogram (structure) of the company Organizational structure includes: Top management, middle management and junior management Personnel functions include: CEO, senior managers, managers, team leaders, supervisors etc. ○ Specific Outcome 2 Apply and adhere to communication procedures within the company or business. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and demonstrate communication procedures with in relation to company procedures. Communication methods: Verbal and non- verbal ○ Specific Outcome 3 Interpret and apply legislative requirements within the company or business. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain legislative requirements in accordance with company policy and procedures. Aviation, pressure vessels, and other industry's legislative requirements conform to SAQA and SD Act in relation to the NQF and Career Pathing. ○ Specific Outcome 4 Apply small business skills within my work environment. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and demonstrate small business skills in relation to material procurement cost analysis, bookkeeping and profit control. ○ Specific Outcomes 5 Adhere and apply security procedures 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration

	<ul style="list-style-type: none"> ○ Assessment Criteria 1. Explain and demonstrate requirements to building access and workplace access in relation to security entrance requirements. 	
Week 2	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 1: Select, use and care for engineering hand tools</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering hand tools ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identify, explain and use all the engineering hand tools; e.g. hand files, spanners, socket sets, specialised sockets, impact sockets, torque wrench, Allen keys, screwdrivers, pliers, clamps, tin snips, hacksaws, chisels, metal shears, hammers, beating files, dollies, spoons, pullers, mallets, bench stakes, files, scrapers, hole punches, anvils and riveters spray guns, sanding blocks, body filler mixing and application tools, 2. Give clear explanations and appropriate examples 3. Refer to appropriate literature when giving explanation 4. Demonstrate the ability to apply the various engineering hand tools in their different applications ○ Specific Outcome 2 Care for and maintain engineering hand tools. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Carry out maintenance of engineering hand tools in accordance with the applicable requirements and workplace procedures 2. Respond correctly to task related questions to confirm understanding 3. Recognise and report problems, changes and/or malfunctions while working with engineering hand tools ○ Specific Outcome 3 Work safely with due care for self, fellow workers, equipment, materials and the environment. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and demonstrate safe working practises 2. Demonstrate an understanding of SHE procedures <p>Exit Level Outcome 2: Select, use and care for engineering measuring equipment</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering measuring equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and discuss basic units of measure, symbols and derived units of measure 2. Use measuring equipment as recommended by the manufacturer to meet job/task requirements 3. Take measurements and record 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration

	<ol style="list-style-type: none"> 4. Identify unsafe/faulty measuring equipment and take corrective action taken 5. Clean, service, maintain and store measuring equipment <ul style="list-style-type: none"> ○ Specific Outcome 2 Care for and maintain measuring equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and discuss basic units of measure, symbols and derived units of measure. 2. Select and use engineering measuring equipment <p>Exit Level Outcome 8: 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"> ○ Specific Outcome 1 Estimate, measure and calculate physical quantities to solve problems in practical situations. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identify and correctly read scales on the measuring instruments 2. Identify the appropriate instrument to measure a particular quantity. 3. Carry out calculations correctly 4. Explain and demonstrate appropriate units measurement and calculation. ○ Specific Outcome 2 Explore transformations of two-dimensional geometric figures ○ Assessment Criteria <ol style="list-style-type: none"> 1. Describe and identify properties of symmetrical shapes 2. Explain and identify concepts of lines of symmetry in 2-dimensional figures using paper folding and reflections in the lines of symmetry. 3. Explain and identify concepts of transformation in terms of reflections, translations and rotations using concrete materials. 	
<p>Week 3</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 4: Apply work site practices</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Establish the principles of personal and job safety on the worksite. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identify hazards in relation to worksite in accordance with the OHS Act; equipment, electrical machinery, chemicals, fire, gas, fumes, compressed air, noise and product 2. Identify personal hazards in relation to worksite; clothing, hair, footwear, jewellery, lifting, handling, and occupational overuse syndrome. 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration

	<ol style="list-style-type: none"> 3. Identify procedures in relation to avoidance of accidents; equipment, machinery, electrical, chemical, fire, fumes, compressed air, gas, protective clothing, storage as laid down in policy or procedure. 4. Identify procedures and principles of relevant acts and regulations relating to safety, health and welfare on worksite. 5. Explain procedures in the event of accident, fire emergency as in policy or procedure <ul style="list-style-type: none"> ○ Specific Outcome 2 Demonstrate safe working practices on the worksite. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Demonstrate safe working practices in the use of machinery as specified in the manufacturer's operational manual and instructions; fences, guards, safety devises, operation and isolation techniques 2. Demonstrate safe working practices which ensure personal safety 3. Explain and demonstrate the storage of hazardous materials as specified by manufacturer; chemicals, gas, compressed air, flammable materials, lubricants, paints, sealants, cleaning fluids, and waste materials. 4. Identify warning signs in relation to hazards. 5. Work areas are kept clean and free of debris; walkways, floors, workbenches, platforms, and conveyers. 6. Use equipment as specified by manufacturer's or standard procedure; electrical, mechanical, fluid, and radiation 7. Explain and demonstrate procedures in the event of fire, accident, chemical spillage, and emergency as laid down by regulation and specified on worksite. 8. Explain how worksite practices comply with Acts, Regulations, and by-laws relating to health, safety and welfare. (OHS Act, Local authority by-laws.) 9. Explain and demonstrate emergency shutdown procedures ○ Specific Outcome 3 Adhere and conform to store procedures and material handling ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and demonstrate store procedures according to worksite practice. 2. Explain and demonstrate correct safety procedures to storing materials 	
<p>Week 4</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 3: Select, use and care for engineering power tools</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Select and use engineering power tools <p>Assessment Criteria</p> <ol style="list-style-type: none"> 1. Use appropriate power tools as recommended by the manufacturer to meet job/task requirements 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations

	<ol style="list-style-type: none"> 2. Identify and take corrective action with regards to unsafe/faulty power tools 3. Clean, service, maintained and stored power tools 4. Maintain a clean and tidy work environment 5. Explain and discuss consequences of incorrectly using power tools, 6. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws) <ul style="list-style-type: none"> ○ Specific Outcome 2 Check on power supply connections to equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and discuss risks and hazards related to the various power supply sources 2. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws) ○ Specific Outcome 3 Recognise and report problems, changes and/or malfunctions while working ○ Assessment Criteria <ol style="list-style-type: none"> 1. Report problems timorously to appropriate personnel 2. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws) ○ Specific Outcome 4 Work safely with due care for self, fellow workers, machines, equipment, materials and environment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Take correct safety precautions against bad connections, damaged air and hydraulic hoses, damaged electrical cables, cracked discs and worn or damaged blades. 2. Use appropriate personal protective equipment when using power tools 3. Engineering power tools include drills (including pedestal drilling machines), grinders (including pedestal grinders), sanders, brushes, buffs, wrenches (including impact type), jacks, nibblers, saws (including power and band saws) 	<ul style="list-style-type: none"> ○ Present information visually ○ Practical demonstration
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<p>Week 5</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 7: Use welding definitions and symbols</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Know the basics of welded joints and their terminology. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Describe and explain definitions used in the welding industry in accordance with AWS standards and practices. Definitions limited to those as prescribed in the AW Standards and practices. 2. Explain and describe different joints and their characteristics. 3. Explain and describe the characteristics of welds, types of joint preparation, weld profile and surface finish ○ Specific Outcome 2 Identify and apply welding symbols used by industry. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and describe weld symbols used in the industry in accordance with AWS instruction manual. Welding symbols is limited to those as prescribed in the AW Standards and practices ○ Specific Outcome 3 Sketch and describe welding symbols used in the industry. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Describe and sketch weld symbols in accordance with AWS and work instruction sheet. Sketches of weld symbols can be done on free hand sketching or formal drawing 2. Identify and interpret welding symbols. 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration
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<p>Weeks 5 to 9</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 6: Identify and select material to specification</p> <ul style="list-style-type: none"> ○ Specific Outcome 2 Identify materials to specification. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identification of materials in accordance with material specification sheet as included in work instructions. 2. Demonstrate all safety precautions in relation to work site practices and procedures 3. Identify materials marked with colour code or identification numbers. Materials to be identified, limited to mild steel, and carbon steels Identification methods visually with the aid of de-coding systems and mechanical processes <p>Exit Level Outcome 14: Use mathematics to investigate and monitor the financial aspects of personal community life.</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Use mathematics to plan and control projected budgets and income and expenditure. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain projected income and expenditure realistically. 2. Carry out calculations using a calculator efficiently and correctly, and solutions obtained are verified in terms of the context. <p>Exit Level Outcome 12: Weld carbon steel work pieces using the gas metal arc welding process in the down-hand position</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Describe the gas metal arc welding process and related equipment. ○ Assessment Criteria <ol style="list-style-type: none"> 1. 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. 2. Explain and identify basic components of the gas metal arc welding equipment and the function and purpose is correct in terms of manufacturer's requirements and standards. 3. Identify and explain parts and equipment and the implications of the incorrect identification of parts. 4. Explain terms and use definitions consistent with generally accepted welding terminology as recorded in international welding standards; 5. Suitable power source, wire-feeder, shielding gas, regulator, flow-meter, materials as specified on drawings and weld filler material, according to welding procedure specification 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration ○ Build Model
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	<ul style="list-style-type: none"> ○ Specific Outcome 2 Select, assemble and conduct pre-operational checks of gas metal arc welding equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Select welding filler material as specified on welding procedure specification. 2. Demonstrate work-piece welded in position. 3. Demonstrate safety precautions during welding process. 4. Explain and demonstrate that welding parameters are established to an approved welding procedure specification (WPS). 5. Demonstrate that work-piece are cleaned after welding as per worksite practices. ○ Specific Outcome 3 Prepare workpieces prior to welding ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and prepare work-pieces prior to welding as specified on drawing and worksite practices. 2. Identify dimensions and check alignment as specified on drawing. 3. Demonstrate tacked work-piece welded in position as per drawing specifications. 4. Demonstrate all safety precautions are adhered to. 5. Inspect work-piece prior to welding. ○ Specific Outcome 4 Weld workpieces ○ Assessment Criteria <ol style="list-style-type: none"> 1. Select welding filler material as specified on welding procedure specification. 2. Demonstrate work-piece welded in position. 3. Demonstrate safety precautions during welding process 4. Explain and demonstrate that welding parameters are established to an approved welding procedure specification (WPS). 5. Demonstrate that work-piece are cleaned after welding as per worksite practices. ○ Specific Outcome 5 Inspect welded workpiece for defects. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Remove all welding spatter as specified in cleaning procedure. 2. Check that welded work-piece conforms to job specifications. 3. Inspection methods and procedures selected are conducive to specifications. ○ Specific Outcome 6 Care for and store welding consumables and equipment. 	
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	<ul style="list-style-type: none"> ○ Assessment Criteria 1. Demonstrate and explain care of tools and equipment as per vendor specifications 2. Demonstrate and explain storage of tools and equipment to conform to worksite practices. 3. Demonstrate and explain storage of welding consumables in accordance with worksite practices. 	
Week 10	<ul style="list-style-type: none"> • Pen and paper test 25% of term mark for basic Welding (Test may be given in any week as per school assessment plan) • Reflect and review 	
<p>Assessment</p> <p>Formal Assessment Task 2:</p> <p>Activity 1 Demonstration: (25 marks) Assess using a memorandum and rubric</p> <p>Activity 2 Model: Learners make a simple model using welding techniques (50 Marks) Assess using a rubric</p> <p>Note: <i>The following skills could be assessed in all demonstrations or models :</i></p> <ul style="list-style-type: none"> ○ <i>Measuring, Cutting, Welding, Grinding, Drilling , Application of safety aspects</i> <p>Activity 3 Pen and Paper Test: (25 marks) Assess using a memorandum.</p> <ul style="list-style-type: none"> ○ Learners respond to questions 		

YEAR 4- ANNUAL TEACHING PLAN

TERM 3

WK	CONTENT	ACTIVITIES
<p>Week 1</p>	<p>⇒ Consolidate learning and skills</p> <p>Learners must be taught how to:</p> <p>Exit Level Outcome 1: Select, use and care for engineering hand tools</p> <p>Exit Level Outcome 2: Select, use and care for engineering measuring equipment</p> <p>Exit Level Outcome 3: Select, use and care for engineering power tools</p> <p>Exit Level Outcome 8: Measure, estimate and calculate physical quantities and explore, describe and represent geometrical relationships in 2-dimensions in different life or workplace context</p> <p>Exit Level Outcome 4: Apply work site practices</p> <p>Exit Level Outcome 5: Describe the welding industry's composition, its productivity requirements and communication techniques</p> <p>Exit Level Outcome 7: Use welding definitions and symbols</p>	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration
<p>Week 2</p>	<p>⇒ Practice the following welding skills</p> <p>Learners must be taught how to:</p> <p>Exit Level Outcome 9 Weld carbon steel work-pieces using the shielded metal arc welding process in the down-hand position.</p> <p>Exit Level Outcome 12: Weld carbon steel work pieces using the gas metal arc welding process in the down-hand position</p>	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration
<p>Weeks 3 to 9</p>	<p>Learners must be taught how to:</p> <p>Exit Level Outcome 6: Identify and select material to specification</p> <ul style="list-style-type: none"> ○ Specific Outcome 2 Identify materials to specification. ○ Assessment Criteria 1. Identification of materials in accordance with material specification sheet as included in work instructions. 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written

	<p>2. Demonstrate all safety precautions in relation to work site practices and procedures</p> <p>3. Identify materials marked with colour code or identification numbers. Materials to be identified, limited to mild steel, and carbon steels Identification methods visually with the aid of de-coding systems and mechanical processes</p> <p>Exit Level Outcome 14: Use mathematics to investigate and monitor the financial aspects of personal community life.</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Use mathematics to plan and control projected budgets and income and expenditure. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain projected income and expenditure realistically. 2. Carry out calculations using a calculator efficiently and correctly, and solutions obtained are verified in terms of the context. <p>Exit Level Outcome 10: Cut materials using the oxy-fuel gas cutting process (manual cutting) and or Plasma cutting process</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Describe the oxy-fuel cutting process ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and demonstrate the importance of correct setting of cutting pressures, and the consequences of incorrect settings 2. 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. 3. Explain consequences of incorrect start up and shut down procedures. 4. Describe and identify cutting characteristics of carbon steel and the implications for un-safe conditions. 5. Explain terms and definitions that are consistent with generally accepted cutting terminology as recorded in cutting standards. ○ Specific Outcome 2 Prepare for the oxy-fuel cutting operation ○ Assessment Criteria <ol style="list-style-type: none"> 1. Demonstrate assembly of Oxy-Fuel gas equipment and test in accordance with manufacturer's instructions and specific safety operating procedures. 2. Demonstrate and explain pre-operational checks in accordance with manufacturer's operations manual and specifications. 3. Cut materials to match work instruction sheet ○ Specific Outcome 3 Cut material 	<p>presentations</p> <ul style="list-style-type: none"> ○ Present information visually ○ Practical demonstration ○ Build Model
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	<ul style="list-style-type: none"> ○ Assessment Criteria 1. Cutting of material is carried out in accordance with work instruction sheet and drawing requirements. 2. Apply and explain safety precautions in accordance with OHS Act (applicable to the cutting process). 3. 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: <ul style="list-style-type: none"> ○ 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 - 10mm. Positions: All positions/directions. ○ Specific Outcome 4 Care and storage of cutting equipment, tools, and materials. ○ Assessment Criteria 1. Explain the caring and storage procedures for tools, equipment in accordance with work site practices and specifications. 2. Demonstrate and explain Oxy-fuel cutting equipment dismantled and stored in accordance with manufacturer's specification and requirements. Exit Level Outcome 11: Weld work pieces using the oxy-acetylene gas welding process in the down hand position ○ Specific Outcome 1 Describe and explain the oxy-acetylene gas welding process. ○ Assessment Criteria 1. Explain and demonstrate the importance of correct assembly of the oxy-acetylene gas welding equipment, and the consequences of incorrect assembly, with reference to the vendor requirements. 2. Identify and explain basic and major components of the oxy-acetylene gas welding equipment function and purpose is correct in terms of vendor requirements and standards. 3. Identify and explain parts and components and the implications for not testing for leaks. 4. Explain terms and use definitions that are consistent with generally accepted welding terminology as recorded in international welding standards. <p><u>Parts include:</u> gas cylinders, gas regulators, flashback arrestors, hoses, clamps, welding torch, welding nozzles, gas cylinder key and soapy water.</p> <p>Parts include: Welding hoses, jubilee clamps, gas cylinders (oxygen and fuel gas), regulators, welding torch, welding nozzles, non-return valves and flashback arrestors.</p>	
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○ **Specific Outcome 2**
Select, assemble and conduct pre operational checks of oxy-acetylene gas welding equipment.

○ **Assessment Criteria**

1. Explain verification of identification and selection of oxy-acetylene gas welding equipment as specified in the welding procedure specification.
2. Identify and rectify hazards relating to welding process in accordance with standard work site practices.
3. Demonstrate and explain pre-operational checks that are carried out in accordance with vendor specifications and to be leak free.

Parts include: Welding hoses, jubilee clamps, gas cylinders (oxygen and fuel gas), regulators, welding torch, welding nozzles, non-return valves and flashback arrestors.

○ **Specific Outcome 3**

Prepare work-pieces prior to welding.

○ **Assessment Criteria**

1. Prepare work-pieces prior to welding as specified on drawing and worksite practices.
2. Check dimensions and alignment as specified on drawing.
3. Explain and demonstrate how tack work-piece are welded in position as per drawing specifications
4. Adhere to safety precautions.
5. Inspect work-piece prior to welding.
Resources include: Worksite practices, tools, equipment, safety requirements and materials

Parts include: Welding hoses, jubilee clamps, gas cylinders (oxygen and fuel gas), regulators, welding torch, welding nozzles, non-return valves and flashback arrestors.

○ **Specific Outcome 4**

Weld metals with oxy-acetylene gas welding process.

○ **Assessment Criteria**

1. Select welding filler material as specified in the welding procedure specifications
2. Weld work-piece in position.
3. Adhere to safety precaution during welding process.
4. Clean work-piece after welding as per worksite practices.

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 -1,6mm.

Resources include: Welding equipment, tools, protective clothing and equipment, welding procedure specification, materials as specified on drawings and weld filler material. Weld positions to include:

Butt and fillet welds in (flat position: square groove butt joint vee groove joint, lap joint, tee and corner joints) (horizontal position: groove joint, lap joint, tee joint)

	<p>Parts include: Welding hoses, jubilee clamps, gas cylinders (oxygen and fuel gas), regulators, welding torch, welding nozzles, non-return valves and flashback arrestors.</p> <ul style="list-style-type: none"> ○ Specific Outcome 5 Inspect welded work piece for defects ○ Assessment Criteria <ol style="list-style-type: none"> 1. Remove all residues, flaking of material and slag as specified in cleaning procedure. 2. Check that welded work-piece conform to specifications as reflected on drawing. 3. Inspection methods and procedures selected as conducive to job requirement. <p>Parts include: Welding hoses, jubilee clamps, gas cylinders (oxygen and fuel gas), regulators, welding torch, welding nozzles, non-return valves and flashback arrestors.</p> <ul style="list-style-type: none"> ○ Specific Outcome 6 Care for and store welding consumables and equipment ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and demonstrate how tools and equipment are cared for as per manufacturer's specifications and stored as per worksite practices. 2. Explain and demonstrate how tools and equipment are stored to conform to worksite practices. 3. Explain and demonstrate how welding consumables are stored in accordance with worksite practices. <p>Parts include: Welding hoses, jubilee clamps, gas cylinders (oxygen and fuel gas), regulators, welding torch, welding nozzles, non-return valves and flashback arrestors</p>	
<p>Week 10</p>	<ul style="list-style-type: none"> • Pen and paper test 25% of term mark for basic Welding (Test may be given in any week as per school assessment plan) • Reflect and review 	

Assessment

Formal Assessment Task 3:

Activity 1

Demonstration:

(25 marks) Assess using a memorandum and rubric

Activity 2

Model:

Learners make a simple model using welding techniques

(50 Marks) Assess using a rubric

Note:

The following skills could be assessed in all demonstrations or models :

- *Measuring, Cutting, Welding, Grinding, Drilling , Application of safety aspects*

Activity 3

Pen and Paper Test: (25 marks) Assess using a memorandum.

- Learners respond to questions

YEAR 4- ANNUAL TEACHING PLAN

TERM 4

WK	CONTENTS	ACTIVITY
<p>Weeks 1 to 6</p>	<p>Learners must be taught how to:</p> <p>⇒ Complete final Model from term 3</p> <p>Exit Level Outcome 6: Identify and select material to specification</p> <ul style="list-style-type: none"> ○ Specific Outcome 2 Identify materials to specification. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Identification of materials in accordance with material specification sheet as included in work instructions. 2. Demonstrate all safety precautions in relation to work site practices and procedures 3. Identify materials marked with colour code or identification numbers. Materials to be identified, limited to mild steel, and carbon steels Identification methods visually with the aid of de-coding systems and mechanical processes <p>Exit Level Outcome 14: Use mathematics to investigate and monitor the financial aspects of personal community life.</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Use mathematics to plan and control projected budgets and income and expenditure. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain projected income and expenditure realistically. 2. Carry out calculations using a calculator efficiently and correctly, and solutions obtained are verified in terms of the context. <p>Exit Level Outcome 10: Cut materials using the oxy-fuel gas cutting process (manual cutting) and or Plasma cutting process</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Describe the oxy-fuel cutting process ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and demonstrate the importance of correct setting of cutting pressures, and the consequences of incorrect settings 2. 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. 3. Explain consequences of incorrect start up and shut down procedures. 4. Describe and identify cutting characteristics of carbon steel and the implications for un-safe conditions. 	<ul style="list-style-type: none"> ○ Oral discussions in pairs and in groups ○ Access information from reference books or suitable resources ○ Sort information ○ Written presentations ○ Present information visually ○ Practical demonstration ○ Build Model

	<p>5. Explain terms and definitions that are consistent with generally accepted cutting terminology as recorded in cutting standards.</p> <ul style="list-style-type: none"> ○ Specific Outcome 2 Prepare for the oxy-fuel cutting operation ○ Assessment Criteria <ol style="list-style-type: none"> 1. Demonstrate assembly of Oxy-Fuel gas equipment and test in accordance with manufacturer's instructions and specific safety operating procedures. 2. Demonstrate and explain pre-operational checks in accordance with manufacturer's operations manual and specifications. 3. Cut materials to match work instruction sheet ○ Specific Outcome 3 Cut material ○ Assessment Criteria <ol style="list-style-type: none"> 1. Cutting of material is carried out in accordance with work instruction sheet and drawing requirements. 2. Apply and explain safety precautions in accordance with OHS Act (applicable to the cutting process). 3. 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: <ul style="list-style-type: none"> ○ 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 - 10mm. Positions: All positions/directions. ○ Specific Outcome 4 Care and storage of cutting equipment, tools, and materials. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain the caring and storage procedures for tools, equipment in accordance with work site practices and specifications. 2. Demonstrate and explain Oxy-fuel cutting equipment dismantled and stored in accordance with manufacturer's specification and requirements. <p>Exit Level Outcome 11: Weld work pieces using the oxy-acetylene gas welding process in the down hand position</p> <ul style="list-style-type: none"> ○ Specific Outcome 1 Describe and explain the oxy-acetylene gas welding process. 	
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	<ul style="list-style-type: none"> ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain and demonstrate the importance of correct assembly of the oxy-acetylene gas welding equipment, and the consequences of incorrect assembly, with reference to the vendor requirements. 2. Identify and explain basic and major components of the oxy-acetylene gas welding equipment function and purpose is correct in terms of vendor requirements and standards. 3. Identify and explain parts and components and the implications for not testing for leaks. 4. Explain terms and use definitions that are consistent with generally accepted welding terminology as recorded in international welding standards. <u>Parts include:</u> gas cylinders, gas regulators, flashback arrestors, hoses, clamps, welding torch, welding nozzles, gas cylinder key and soapy water. <p>Parts include: Welding hoses, jubilee clamps, gas cylinders (oxygen and fuel gas), regulators, welding torch, welding nozzles, non-return valves and flashback arrestors.</p> ○ Specific Outcome 2 Select, assemble and conduct pre operational checks of oxy-acetylene gas welding equipment. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Explain verification of identification and selection of oxy-acetylene gas welding equipment as specified in the welding procedure specification. 2. Identify and rectify hazards relating to welding process in accordance with standard work site practices. 3. Demonstrate and explain pre-operational checks that are carried out in accordance with vendor specifications and to be leak free. <u>Parts include:</u> Welding hoses, jubilee clamps, gas cylinders (oxygen and fuel gas), regulators, welding torch, welding nozzles, non-return valves and flashback arrestors. ○ Specific Outcome 3 Prepare work-pieces prior to welding. ○ Assessment Criteria <ol style="list-style-type: none"> 1. Prepare work-pieces prior to welding as specified on drawing and worksite practices. 2. Check dimensions and alignment as specified on drawing. 3. Explain and demonstrate how tack work-piece are welded in position as per drawing specifications 4. Adhere to safety precautions. 5. Inspect work-piece prior to welding. <u>Resources include:</u> Worksite practices, tools, equipment, safety requirements and materials <p>Parts include: Welding hoses, jubilee clamps, gas cylinders (oxygen and fuel gas), regulators, welding torch, welding nozzles, non-return valves and flashback arrestors.</p> 	
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o **Specific Outcome 4**

Weld metals with oxy-acetylene gas welding process.

o **Assessment Criteria**

1. Select welding filler material as specified in the welding procedure specifications
2. Weld work-piece in position.
3. Adhere to safety precaution during welding process.
4. Clean work-piece after welding as per worksite practices. 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 -1,6mm.
Resources include: Welding equipment, tools, protective clothing and equipment, welding procedure specification, materials as specified on drawings and weld filler material. Weld positions to include:
Butt and fillet welds in (flat position: square groove butt joint vee groove joint, lap joint, tee and conner joints) (horizontal position: groove joint, lap joint, tee joint)

Parts include: Welding hoses, jubilee clamps, gas cylinders (oxygen and fuel gas), regulators, welding torch, welding nozzles, non-return valves and flashback arrestors.

o **Specific Outcome 5**

Inspect welded work piece for defects

o **Assessment Criteria**

1. Remove all residues, flaking of material and slag as specified in cleaning procedure.
2. Check that welded work-piece conform to specifications as reflected on drawing.
3. Inspection methods and procedures selected as conducive to job requirement.

Parts include: Welding hoses, jubilee clamps, gas cylinders (oxygen and fuel gas), regulators, welding torch, welding nozzles, non-return valves and flashback arrestors.

o **Specific Outcome 6**

Care for and store welding consumables and equipment

o **Assessment Criteria**

1. Explain and demonstrate how tools and equipment are cared for as per manufacturer's specifications and stored as per worksite practices.
2. Explain and demonstrate how tools and equipment are stored to conform to worksite practices.
3. Explain and demonstrate how welding consumables are stored in accordance with worksite practices.
Parts include: Welding hoses, jubilee clamps, gas cylinders (oxygen and fuel gas), regulators, welding torch, welding nozzles, non-return valves and flashback arrestors

Week 7	<ul style="list-style-type: none"> • Pen and paper test 25% of term mark for basic Welding (Test may be given in any week as per school assessment plan) • Reflect and review 	
<p>Assessment</p> <p>Formal Assessment Task 4:</p> <p>Activity 1 Demonstration: (25 marks) Assess using a memorandum and rubric</p> <p>Activity 2 Model: Learners make a simple model using welding techniques (50 Marks) Assess using a rubric</p> <p>Note: <i>The following skills could be assessed in all demonstrations or models :</i></p> <ul style="list-style-type: none"> ○ <i>Measuring, Cutting, Welding, Grinding, Drilling , Application of safety aspects</i> <p>Activity 3 Pen and Paper Test: (25 marks) Assess using a memorandum.</p> <ul style="list-style-type: none"> ○ Learners respond to questions 		