

2022 Annual Teaching Plan: Term 1 Mechanical Technology: Welding and Metalwork Grade 10

TERM 1 (47 days)	Week 1 – 2 (10 days)	Week 3 – 6 (19 days)	Week 7 – 8 (8 days)	Week 9 – 10 (10 days)	
CAPS Topics	Safety (Generic)	TERMINOLOGY (Welding) (Specific)		Tools (Generic)	
Topics /Concepts, Skills and Values	<p>Organise and manage activities responsibly and effectively, including self-management and HIV/Aids awareness; Safety precautions taken into account during performance-based activities in order to avoid injuries or incidents. Explain his/her rights, human rights, contributions and responsibilities. Understanding of the OHS Act Learners must be fully aware of all the safety precautions to be taken during performance-based activities, in order to avoid injuries or incidents. Refer specifically to the following tools/machines/equipment:</p> <ul style="list-style-type: none"> • Different hand tools • Pedestal drill • Bench grinder • Guillotine • Bending machine • Power saws <p>Identify safe and hazardous acts and conditions e.g. speed of emery wheels, etc. Apply personal hygiene measures. Refer specifically to the following tools/machines/equipment (refer to Topic 2: Tools):</p> <ul style="list-style-type: none"> • Different hand tools • Pedestal drill • Pedestal grinder • Guillotine • Compressors • Fire extinguishing apparatus <p>Practical: Identify safe and hazardous acts and conditions (e.g., speed of emery wheels, Maximum lift on hydraulic equipment etc.) Apply personal hygiene measures. Note: Clean workshop on a weekly basis. First Aid HIV/Aids Awareness Understand the OHS Act Learners must be fully aware of all the safety precautions when using the following tools:</p> <ul style="list-style-type: none"> • Hand tools • pedestal drill • Bench grinder 	<p>Explain the following terms with the aid of sketches:</p> <ul style="list-style-type: none"> • Arc • Arc length • Leg length • Included angle • Parent metal • Penetration • Reinforcement • Root • Root face • Root run • Run • Tack welding • Toe of weld • Weld bead • Welding voltage • Welding current • Welding heat <p>PRACTICAL: Explain the welding terms by means of sketches</p> <p>TEMPLATES</p> <ul style="list-style-type: none"> • Materials used for template: wood, cardboard • steel and hardboard • Principle of simple setting-out of the right angle • and the application of Pythagoras' theory <p>Practical: Do calculations on the theorem of Pythagoras and apply the principle by setting a right-angled project.</p>	<p>PRINCIPLES AND FUNCTIONS OF</p> <ul style="list-style-type: none"> • Arc welding machines such as AC and DC • Arc welding accessories <p>ELECTRICAL ASPECTS REGARDING ARC WELDING</p> <p>Explain the following:</p> <ul style="list-style-type: none"> • Volts • Current (Ampere) • Resistance • Polarity • Arc voltage • Direct current • Alternating current • Earthing • Single phase • Three phase • Voltage drop <p>Practical: Demonstrate an understanding of arc welding equipment by assembling the equipment in the correct sequence.</p>	<p>Basic tools and equipment:</p> <ul style="list-style-type: none"> • Spanners: ring-, flat- and combination- • Sockets and accessories • Pliers: • Hammers • Chisels, hacksaws, • Screwdrivers • Allen keys • Files • Stocks & dies. <p>Application of measuring and marking-off instruments:</p> <ul style="list-style-type: none"> • Steel Rule • Square • Scriber • Tape measure • Combination set • Punches <p>Practical: Use the marking-off plate from Topic "Tools" and drill and tap two (2) holes.</p>	Revision and Assessment of Assignment
Requisite pre-knowledge					
Resources (other than textbook) to enhance learning	OHS act, Safety signs in workshop, First aid manuals & Hand tools & Equipment	Tools and equipment as mentioned above.		Tools and equipment as mentioned above.	
Assessment	Informal Assessment: Remediation	Classwork/case studies/worksheets/homework/class tests (Theory and practical work)			
	SBA (Formal)	<p>PAT Phase 1 Assignment</p> <p>The legislation governing workplaces in relation to COVID – 19 is the Occupational Health and Safety Act, Act 85 of 1993, as amended, read with the Hazardous Biological Agents Regulations. Section 8 (1) of the Occupational Health and Safety (OHS) Act, Act 85 of 1993,</p> <p>Safe work practices are types of administrative controls that include procedures for safe and proper work used to reduce the duration, frequency, or intensity of exposure to a hazard. Examples of safe work practices for SARS-CoV-2 include. Requiring regular hand washing or using of alcohol-based hand rubs. Learners and teachers should always wash hands when they are visibly soiled and after removing any PPE. Keep safe distances and wear a mask at all times.</p> <p>See the document on the workshop safety measures</p>			

2022 Annual Teaching Plan: Term 2 Mechanical Technology: Welding and Metalwork Grade 10

TERM 2 (53 days)	Week 1 – 3 (12 days)	Week 4 – 7 (18 days)	Week 8 – 10 (15 days)	Week 11 – 12 (9 days)
CAPS Topics	Joining methods (Generic)	Forces (Generic)	Terminology (Welding symbols and joints)	Assessment /consolidation
Topics /Concepts, Skills and Values	<p>Calculations on the size of drills and key dimensions:</p> <ul style="list-style-type: none"> • Drill sizes for screw cutting • Width, thickness and length of keys <p>Semi-permanent joining methods:</p> <ul style="list-style-type: none"> • Bolts • Studs • Locking devices • Nuts • Split pins • Rivets <p>Keys – Identification, fitting and uses of the following types:</p> <ul style="list-style-type: none"> • Parallel • Taper • Gib head • Woodruff keys 	<p>Forces: Differentiate between the different types of forces found in engineering components:</p> <ul style="list-style-type: none"> • Pulling force (Tensile) • Compressive force • Shearing force <p>Components of forces:</p> <ul style="list-style-type: none"> • Parallelogram of forces – resultant of two forces graphically only; <p>Moments: Moments found in engineering components (basic calculations):</p> <p>Definition: Moment = force x perpendicular distance (Spanner used to tighten a nut or bolt)</p> <p>Stress (Basic calculations on):</p> <ul style="list-style-type: none"> • Square bar • Round bar <p>Practical: Calculations to determine</p> <ul style="list-style-type: none"> • forces, • moment and • stress 	<p>Identifying the different WELDING SYMBOLS:</p> <ul style="list-style-type: none"> • Elements of welding symbols <p>Theory and Application of PERMANENT JOINTS (Arc welding):</p> <ul style="list-style-type: none"> • Lap joint • Butt joint • T-joint • Edge • Corner <p>Practical: Apply the identified welding symbols by welding different types of joints using arc-welding.</p>	
Requisite pre-knowledge	Grade 9 forces			
Resources (other than textbook) to enhance learning	Bolt, nuts, etc. as mentioned above. Instructional videos, You-tube videos, etc.	Testing equipment to demonstrate different types of forces. Calculators	Arc-welding equipment. as mentioned above. Instructional videos, You-tube videos, etc.	
Assessment	Informal Assessment: Remediation	Classwork/case studies/worksheets/homework/class tests (Theory and practical work)		
	SBA (Formal)	<p style="text-align: center;">PAT Phase 2 Term Test</p> <p>The legislation governing workplaces in relation to COVID – 19 is the Occupational Health and Safety Act, Act 85 of 1993, as amended, read with the Hazardous Biological Agents Regulations. Section 8 (1) of the Occupational Health and Safety (OHS) Act, Act 85 of 1993,</p> <p>Safe work practices are types of administrative controls that include procedures for safe and proper work used to reduce the duration, frequency, or intensity of exposure to a hazard. Examples of safe work practices for SARS-CoV-2 include. Requiring regular hand washing or using of alcohol-based hand rubs. Learners and teachers should always wash hands when they are visibly soiled and after removing any PPE. Keep safe distances and wear a mask at all times. See the document on the workshop safety measures</p>		

2022 Annual Teaching Plan: Term 3 Mechanical Technology: Welding and Metalwork Grade 10

TERM 3 (52 days)		Week 1 (4 days)	Week 2 – 7 (28 days)	Week 8 – 11 (20 days)
CAPS Topics		MAINTENANCE (GENERIC)	TERMINOLOGY DEVELOPMENTS (Specific)	PAT, remediation & Test
Topics /Concepts, Skills and Values		Define the following types of maintenance: <ul style="list-style-type: none"> • Preventive • Predictive • Reliability centred maintenance Lack of maintenance on equipment <ul style="list-style-type: none"> • Excessive wear • Overheating/seizing; and distortion • Failure Disadvantages of an unbalanced work piece or machine part Practical: Analyse and predict the outcome of the lack of maintenance on equipment used in the workshop	Development of: <ul style="list-style-type: none"> • Elbows with one joint only • Right angled and oblique T pieces of equal diameters • Unequal diameter pipes, including shapes of holes. All branches to be on centre of the main pipe • Right cones with top and base parallel to the horizontal plane Practical: Demonstrate an understanding of developments by developing/ producing models from the drawings of right angled and oblique T-pieces of equal and unequal diameters, and the right cones with the top and base parallel to the horizontal	
Requisite pre-knowledge				
Resources (other than textbook) to enhance learning		Instructional videos, You-tube videos, etc. Past question papers	Instructional videos, You-tube videos, etc. Past question papers	
Assessment	Informal Assessment Remediation	Classwork/case studies/worksheets/homework/class tests (Theory and practical work)		
	SBA (Formal)	<p style="text-align: center;">PAT Phase 3 Term Test</p> <p>The legislation governing workplaces in relation to COVID – 19 is the Occupational Health and Safety Act, Act 85 of 1993, as amended, read with the Hazardous Biological Agents Regulations. Section 8 (1) of the Occupational Health and Safety (OHS) Act, Act 85 of 1993,</p> <p>Safe work practices are types of administrative controls that include procedures for safe and proper work used to reduce the duration, frequency, or intensity of exposure to a hazard. Examples of safe work practices for SARS-CoV-2 include. Requiring regular hand washing or using of alcohol-based hand rubs. Learners and teachers should always wash hands when they are visibly soiled and after removing any PPE. Keep safe distances and wear a mask at all times.</p> <p style="text-align: center;">See the document on the workshop safety measures</p>		

2022 Annual Teaching Plan: Term 4 Mechanical Technology: Welding and Metalwork Grade 10

TERM 4 (47 days)		Week 1 – 2 (9 days)	Week 3 – 5 (15 days)	Week 6 – 10 (23 days)
CAPS Topics		MATERIALS (GENERIC)	Finalisation and Consolidation of PAT Revision, remediation	Examination
Topics /Concepts, Skills and Values		<p>Characteristics, composition and use of:</p> <ul style="list-style-type: none"> • Ferrous metals and alloys: <ul style="list-style-type: none"> ➢ Low carbon steel ➢ Medium carbon steel ➢ High carbon steel ➢ Cast iron: <ul style="list-style-type: none"> • Grey cast iron • White cast iron ➢ Stainless steel (manganese, chrome, vanadium, titanium, tungsten, molybdenum and cobalt) • Non-ferrous elements: <ul style="list-style-type: none"> ➢ Copper, tin, lead, zinc, aluminium, nickel • Non-ferrous alloys: <ul style="list-style-type: none"> ➢ Brass, bronze, phosphor bronze, white metal, duralumin and solder <p>Practical:</p> <ul style="list-style-type: none"> • Collect a sample of 5 non-ferrous elements and 5 non-ferrous alloys • Give 2 uses for each sample collected. 		
Requisite pre-knowledge		Materials		
Resources (other than textbook) to enhance learning		Examples of the different types of materials as used in the Welding and Metalwork environment. Instructional videos, You-tube videos, etc.		
Assessment	Informal Assessment: Remediation	Classwork/case studies/worksheets/homework/class tests (Theory only)		
	SBA (Formal)	EXAMINATION		