

2022 Annual Teaching Plan Term 1: Mechanical Technology: Fitting & Machining Grade 10

TERM 1 (47 days)	Week 1 - (2) (5 days)	Week 2 - (3) (5 days)	Week 3 - (4) (5 days)	Week 4 - (5) (5 days)	Week 5 - 9 (22 days)	Week 10 (5 days)
CAPS Topics	SAFETY (Generic)	SAFETY (Generic)	TOOLS (Generic)	TOOLS (Generic)	TERMINOLOGY (Machining) (Specific)	Revision, Assignment
Topics /Concepts, Skills and Values	<p>Organise and manage activities responsibly and effectively, including self-management and HIV/Aids awareness;</p> <p>Safety precautions taken into account during performance-based activities in order to avoid injuries or incidents.</p> <p>Explain his/her rights, human rights, contributions and responsibilities:</p> <p>Knowledge of basic first aid</p> <p>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 lathe Milling Machine <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.</p> <p>Note: Apply personal hygiene measures. Clean workshop on a weekly basis.</p>	<p>Identify safe and hazardous acts and conditions (e.g. speed of emery wheels etc.) Refer specifically to the following tools/machines/equipment (refer to Topic 2:</p> <ul style="list-style-type: none"> Power saws Compressors Fire extinguisher <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.</p> <p>Note: Apply personal hygiene measures. Clean workshop on a weekly basis</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 instruments to mark-off a plate (at least 5mm thick) with 5 holes.</p>	<p>Simple readings on:</p> <ul style="list-style-type: none"> Vernier callipers Outside, inside and depth micrometers <p>Lathe:</p> <ul style="list-style-type: none"> Classification Types of bed: V and flat and gap Functions of: <ul style="list-style-type: none"> Feed shaft Head stock Lead screw Tail stock Carriage Function and purpose of the 3- and 4-jaw chuck Coolants (Application and advantages and disadvantages) Cutting tool (high speed steel): <ul style="list-style-type: none"> Clearance angles Cutting angles Differentiate between high speed steel cutting tools and tungsten tip tools Tool holders and boring bars (Types and uses) Apply cutting procedures for diameter turning and facing Taper turning (Methods, Advantages and disadvantages): <ul style="list-style-type: none"> Compound slide Tail stock Taper turning attachment Cutting tool Screw cutting (Compound slide – Theory only): <ul style="list-style-type: none"> Characteristics and elements of metric V-thread Parallel Half of the included angle of the thread Use of the screw thread pitch gauge and screw cutting gauge <p>Practical:</p> <ul style="list-style-type: none"> Use the abovementioned measuring instruments and demonstrate the measurement of given sizes. Facing and parallel turning of a work piece on the centre lathe. Machining of an outside taper using the compound slide only on the same work piece used for the facing and parallel turning 	
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.		Verniers, micrometers, lathes, HSS cutting tools,	
Assessment	Informal	Classwork/case studies/worksheets/homework/class tests (Theory and practical work)				
	SBA & PAT Formal	<p>PAT Phase 1 = 50 marks: (Practical of: Safety, Tools and Terminology) Start Phase 4</p> <p>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: Fitting & Machining Grade 10

TERM 2 (53 days)	Week 1 - 2 (8 days)	Week 2 - 4 (12 days)	Week 5 - 6 (10 days)	Week 7 - 8 (10 days)	Week 9 - 12 (18 days)
CAPS Topics	JOINING METHODS (Generic)	FORCES (Generic)	MAINTENANCE (Generic)	Revision, Consolidation and PAT	Term Test / Exam
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>Semi-permanent joining methods:</p> <ul style="list-style-type: none"> • Keys – Identification, fitting and uses of the following types: <ul style="list-style-type: none"> ➢ Parallel key ➢ Taper key, ➢ Gib-head key ➢ Woodruff key <p>Practical: Use the marking-off plate from Topic “Tools” and drill and tap two (2) holes.</p>	<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"> • Graphical and mathematical solution of the horizontal and vertical component of a single force acting at an angle. <p>Practical: Use basic calculations to determine forces.</p>	<p>Properties of lubricants:</p> <ul style="list-style-type: none"> • Viscosity • Pour point • Flash point <p>Grading of oil according to viscosity: (SAE standards)</p> <ul style="list-style-type: none"> • Transmission oil • Grease <p>Friction:</p> <ul style="list-style-type: none"> • Characteristics • Application <p>Define the following types of maintenance:</p> <ul style="list-style-type: none"> • Preventive • Predictive • Reliability centred maintenance <p>Identify the outcome of the lack of maintenance on equipment used in the workshop:</p> <ul style="list-style-type: none"> • Excessive wear • Overheating/seizing; and distortion (lack of cooling and lubrication) • Failure e.g. hydraulics/pneumatics, controls and cables <p>Disadvantages of an unbalanced work piece or machine part</p> <p>Practical: Analyse and predict the outcome of the lack of maintenance on equipment used in the workshop</p>		
Requisite pre-knowledge	Hand Tools and 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	Different types of oils Instructional videos, You-tube videos, etc	Past question papers etc.	
Assessment	Informal	Classwork/case studies/worksheets/homework/class tests (Theory and practical work)			
	SBA & PAT Formal	<p>PAT Phase 2 = 50 marks: (Practical of: Joining methods, Forces & Maintenance)</p> <p>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>See the document on the workshop safety measures</p>			

2022 Annual Teaching Plan Term 3: Mechanical Technology: Fitting & Machining Grade 10

TERM 3 (52 days)	Week 1 - 2 (9 days)	Week 3 - 8 (28 days)	Week 9 (5 days)	Week 10 - 11 (10 days)
CAPS Topics	MATERIALS (Generic)	SYSTEMS AND CONTROL (Drive systems) (Specific)	Revision / Consolidation of PAT	Control Test
Topics /Concepts, Skills and Values	Characteristics, composition and use of: <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 Practical: <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 	MECHANICAL: Identify different drive systems referring to application., <ul style="list-style-type: none"> Spur gears Pulleys and belt drives Chain drives Identification and application on the following screw threads (properties, uses, profiles and angles): <ul style="list-style-type: none"> ISO Metric V-thread (fine and coarse) Square thread Acme thread Practical: Identify the most suitable mechanical drive system for various applications		
Requisite pre-knowledge	Materials			
Resources (other than textbook) to enhance learning	Different materials as listed above, magnets etc. Instructional videos, You-tube videos, etc.	Gear, belt and chain drive instructional kits. Instructional videos, You-tube videos, etc		
Assessment	Informal	Classwork/case studies/worksheets/homework/class tests (Theory and practical work)		
	SBA & PAT Formal	<p style="text-align: center;">Term Test</p> <p style="text-align: center;">PAT phase 3 = 50 marks: (Practical of: Materials and Systems & Control) Finalise Phase 4</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: Fitting & Machining Grade 10

TERM 4 (47 days)	Week 1 - 3 (14 days)	Week 4 - 5 (10 days)	Week 6 - 10 (23 days)
CAPS Topics	TERMINOLOGY (Machining) (Specific)	Revision and Consolidation	November examination
Topics /Concepts, Skills and Values	<p>Simple readings on:</p> <ul style="list-style-type: none"> Vernier callipers Outside, inside and depth micrometers <p>Lathe:</p> <ul style="list-style-type: none"> Classification Types of bed: V and flat and gap Functions of: <ul style="list-style-type: none"> ➤ Feed shaft ➤ Head stock ➤ Lead screw ➤ Tail stock ➤ Carriage Function and purpose of the 3- and 4-jaw chuck Coolants (Application and advantages and disadvantages) Cutting tool (high speed steel): <ul style="list-style-type: none"> ➤ Clearance angles ➤ Cutting angles ➤ Differentiate between high speed steel cutting tools and tungsten tip tools ➤ Tool holders and boring bars (Types and uses) Apply cutting procedures for diameter turning and facing Taper turning (Methods, Advantages and disadvantages): <ul style="list-style-type: none"> ➤ Compound slide ➤ Tail stock ➤ Taper turning attachment ➤ Cutting tool Screw cutting (Compound slide – Theory only): <ul style="list-style-type: none"> ➤ Characteristics and elements of metric V-thread ➤ Parallel ➤ Half of the included angle of the thread ➤ Use of the screw thread pitch gauge and screw cutting gauge <p>Practical:</p> <ul style="list-style-type: none"> Use the abovementioned measuring instruments and demonstrate the measurement of given sizes. Facing and parallel turning of a work piece on the centre lathe. Machining of an outside taper using the compound slide only on the same work piece used for the facing and parallel turning 		
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. Verniers, micrometers, lathes, HSS cutting tools,		
Assessment	Informal	Classwork/case studies/worksheets/homework/class tests (Theory and practical work)	
SBA & PAT Formal	<p>PAT phase 4 = 100 marks: Finalisation of Phase 4: If it was not completed in term 3</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> <p>Examination</p>		