

2021 Annual Teaching Plan Term 1: Mechanical Technology: Fitting & Machining Grade 10

TERM 1 (45 days)	Week 1 – (2) 27 January – 2 February (5 days)	Week 2 – (3) 3 - 9 February (5 days)	Week 3 – (4) 10 - 16 February (5 days)	Week 4 – (5) 17 - 23 February (5 days)	Week 5 - 9 24 February – 26 March (22 days)	Week 10 29 - 31 March (3 days)
CAPS Topics	Safety (Generic)	Safety (Generic)	Tools (Generic)	Tools (Generic)	TERMINOLOGY (Machining) (Specific)	Revision Assignment
Topics /Concepts, Skills and Values	<p>First Aid HIV/Aids Awareness</p> <p>Understand the OHS Act</p> <p>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:</p> <p>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: Clean workshop on a weekly basis.</p>	<p>First Aid HIV/Aids Awareness</p> <p>Understand the OHS Act</p> <p>Learners must be fully aware of all the safety precautions when using the following tools:</p> <ul style="list-style-type: none"> • Power saws • Compressors • Fire extinguisher <p>Practical:</p> <p>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: 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:</p> <p>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. <p>Machining of an outside taper using the compound slide only on the same work piece used for the facing and parallel turning</p>	
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 Assessment: Remediation	Classwork/case studies/worksheets/homework/class tests (Theory and practical work)		
	SBA & PAT (Formal)	<p style="text-align: center;">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 style="text-align: center;">See the document on the workshop safety measures</p>		

2021 Annual Teaching Plan – Term 2: Mechanical Technology: Fitting & Machining Grade 10

TERM 2 (51 days)	Week 1 13 – 16 April (4 days)	Week 2 19 – 23 April (5 days)	Week 3 28 – 30 April (3 days)	Week 4 3 – 7 May (5 days)	Week 5 10 – 14 May (5 days)	Week 6 17 – 21 May (5 days)	Week 7 24 -28 May (5 days)	Week 8 31May - 4 June (5 days)	Week 9 7 – 11 June (5 days)	Week 10 14 – 18 June (4 days)	Week 11 21 – 25 June (5 days)	
CAPS Topics	TERMINOLOGY (Machining) (Specific)	Joining methods (Generic)	Joining methods (Generic)	Forces (Generic)		Maintenance (Generic)	Maintenance (Generic)	Revision Consolidation of PAT Term Test)				
Topics /Concepts, Skills and Values	From term 1: Practical <ul style="list-style-type: none"> measuring, turning PAT 	Calculations on the size of drills and key dimensions: <ul style="list-style-type: none"> Drill sizes for screw cutting Width, thickness and length of keys Semi-permanent joining methods: <ul style="list-style-type: none"> Bolts Studs Locking devices Nuts Split pins Rivets Semi-permanent joining methods: <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 Practical: Use the marking-off plate from Topic “Tools” and drill and tap two (2) holes.	Forces: Differentiate between the different types of forces found in engineering components: <ul style="list-style-type: none"> Pulling force (Tensile) Compressive force Shearing force Components of forces: <ul style="list-style-type: none"> Graphical and mathematical solution of the horizontal and vertical component of a single force acting at an angle. Practical: Use basic calculations to determine forces.	Properties of lubricants: <ul style="list-style-type: none"> Viscosity Pour point Flash point Grading of oil according to viscosity: (SAE standards) <ul style="list-style-type: none"> Transmission oil Grease Friction: <ul style="list-style-type: none"> Characteristics Application Define the following types of maintenance: <ul style="list-style-type: none"> Preventive Predictive Reliability centred maintenance Identify the outcome of the lack of maintenance on equipment used in the workshop: <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 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								
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.							
Assess	Informal Assessment: Remediation	Classwork/case studies/worksheets/homework/class tests (Theory and practical work)										

	<p>SBA & PAT (Formal)</p>	<p align="center">PAT Phase 2 (Practicals of Joining methods, Forces & Maintenance) 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 align="center">See the document on the workshop safety measures</p>			
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2021 Annual Teaching Plan Term 3: Mechanical Technology: Fitting & Machining Grade 10

TERM 3 (52 days)	Week 1-2 13 – 23 July (9 days)	Week 3-8 26 July – 3 Sept (34 days)	Week 9 6 - 10 Sept (5 days)	Week 10 13 - 17 Sept (5 days)	Week 11 20 - 23 Sept (4 days)
CAPS Topics	MATERIALS (Generic)	SYSTEMS AND CONTROL (Drive systems)(Specific)	Consolidation of PAT	Revision	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 Assessment: Remediation	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 (Practicals of Materials and Systems & Control)</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>			

2021 Annual Teaching Plan – Term 4: Mechanical Technology: Fitting & Machining Grade 10

TERM 4 (47 days)	Week 1 - 3 5 - 22 Oct (14 days)	Week 4 - 5 25 Oct – 5 Nov (10 days)	Week 6 - 7 8 - 19 Nov (5 days)	Week 8 - 11 22 Nov – 8 Dec (15 days)
CAPS Topics	Machining (Specific)	TERMINOLOGY (Machining) (Specific)	Revision and Consolidation	November examination
Topics /Concepts, Skills and Values	Simple readings on: <ul style="list-style-type: none"> • Vernier callipers • Outside, inside and depth micrometers Lathe: <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 Practical: <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	Consolidate all PAT tasks and complete all practical work		
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 Assessment: Remediation	Classwork/case studies/worksheets/homework/class tests (Theory and practical work)
	SBA (Formal)	<p style="text-align: center;">PAT phase 4 = (100 marks) Finalisation of Phase 4: If it was not completed in term 3)</p> <p style="text-align: center;">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 style="text-align: center;">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> <p style="text-align: center;">Examination</p>