

2023/24 ANNUAL TEACHING PLANS: MECHANICAL TECHNOLOGY (AUTOMOTIVE): GRADE 11 (TERM 1)

TERM 1	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10	WEEK 11
CAPS TOPICS	SAFETY (GENERIC)	SAFETY (GENERIC)	TOOLS (GENERIC)	TOOLS (SPECIFIC)	ENGINES (SPECIFIC)	ENGINES (SPECIFIC) VALVE ASSEMBLIES:			PAT CONSOLIDATION	REVISION AND ASSESSMENT (ASSIGNMENT)	
TOPICS, CONCEPTS, SKILLS, AND VALUES	First aid HIV/AIDS awareness OHS Act General workshop safety. <ul style="list-style-type: none"> Machine-specific safety measures when dealing with: Grinding machines (angle grinder and bench grinder) Cutting machines 	Machine-specific safety measures when dealing with: <ul style="list-style-type: none"> Press machines (drill press, hydraulic press) 	The principles and functions and applications of the following: <ul style="list-style-type: none"> Stocks and dies (characteristics and drill sizes) Grinding machines Cutting machines (drilling machines) Press machines 	The functions and applications of the following: <ul style="list-style-type: none"> Dial indicators Telescopic gauges Torque wrenches Outside, inside micrometres and vernier calliper 	C.I. Engines: Combustion chamber designs for direct and indirect injection Injector: Function, construction, operation and types of nozzles	<ul style="list-style-type: none"> Identify various overhead valve arrangements Identify various camshafts arrangements: SOHC and DOHC 	<ul style="list-style-type: none"> Cam followers – mechanical and hydraulic valve timing diagram Continuously variable valve timing (CVVT) system 	<ul style="list-style-type: none"> Purpose and importance of valve clearance Timing gears, chains, belt drives and tensioners 	Completion of PAT that was done throughout term 1		
REQUISITE PRE-KNOWLEDGE	HIV/AIDS Awareness		Hand tools and cutting tools	Hand tools and measuring tools	Operating principles of 2- & 4-stroke internal combustion engines	Operating principles of 2- & 4-stroke internal combustion engines					
RESOURCES (OTHER THAN TEXTBOOK) TO ENHANCE LEARNING	OHS Act, safety signs in workshop, first aid manuals & tools & equipment	OHS Act, safety signs in workshop, first aid manuals & tools & equipment	Tools and equipment as mentioned above.	Engine components. Tools and equipment as mentioned above.	Direct and Indirect injection C.I. engines, different types of injectors.	Engines with various OHV assemblies, YouTube videos	Engines with various OHV assemblies, YouTube videos				
ASSESSMENT	INFORMAL ASSESSMENT: REMEDIATION	Demonstrate the competent use of the specific tools above with the measuring of various engine components to determine wear etc. (e.g., bore, piston and crankshaft). Tighten bolts to the correct torque in the correct sequence (cylinder head).			Research the CVVT systems used by any 4 various manufacturers of motor vehicles. Use a practical method and determine the valve timing of a four-cylinder four-stroke engine (with or without marks). Record findings.						
	SBA & PAT (FORMAL)	PAT Phase 1 Assignment									

2023/24 ANNUAL TEACHING PLANS: MECHANICAL TECHNOLOGY (AUTOMOTIVE): GRADE 11 (TERM 2)

TERM 2		WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10	WEEK 11
CAPS TOPICS		SYSTEMS AND CONTROL (SPECIFIC)					SYSTEM AND CONTROL (SPECIFIC)			PAT CONSOLIDATION	REVISION AND ASSESSMENT (CONTROLLED TEST)	
TOPICS, CONCEPTS, SKILLS, AND VALUES		Basic function, construction, and operation of final drives: <ul style="list-style-type: none"> Spiral bevel type Hypoid type Conventional differential Limited slip differential 	Identify the layout and purpose of different drive systems: <ul style="list-style-type: none"> Four-wheel drive All-wheel drive Hydraulic brakes: <ul style="list-style-type: none"> Master Cylinder (Construction, Function & Operation) 	Hydraulic brakes: <ul style="list-style-type: none"> Vacuum servo unit (purpose and operation) ABS braking system (Basic layout and operation) 	Define the difference in construction between: <ul style="list-style-type: none"> Front axles Rear axles: <ul style="list-style-type: none"> Semi-floating Full-floating 	Steering systems, layout & operation: <ul style="list-style-type: none"> Types of steering boxes (rack and pinion gearing and worm gearing) Power steering Electric p/steering 	Identify the function & purpose of the following steering control components: <ul style="list-style-type: none"> Drag links Tie rod ends Ball joints 	Suspension layout and operation: <ul style="list-style-type: none"> Define sprung and un-sprung mass Semi-elliptic leaf Coil springs Torsion bars 	<ul style="list-style-type: none"> Control <ul style="list-style-type: none"> Telescopic shock absorbers (gas and hydraulic) Anti-roll bars Stabilisers 	Completion of PAT that was done throughout term 2		
REQUISITE PRE-KNOWLEDGE			Engine layout from Grade 10 syllabus Hydraulic brake systems	Hydraulic brake systems	Hydraulic brake systems							
RESOURCES (OTHER THAN TEXTBOOK) TO ENHANCE LEARNING		Different types of final drives, hand tools, YouTube, educational videos, etc.	Different types of final drives and layouts, hand tools, etc.	Hydraulic brakes components and operational system, hand tools, etc.	Vacuum servo units, hand tools	Steering control components (as above): Educational videos on axles, etc.	Steering control components (as above): Educational videos, etc.					
ASSESSMENT	INFORMAL ASSESSMENT: REMEDIATION	Use an actual differential in the workshop and explain the power flow under different simulated conditions and record findings		Inspect master cylinder components and compile condition report								
	SBA & PAT (FORMAL)		PAT Phase 2 Controlled Test									

2023/24 ANNUAL TEACHING PLANS: MECHANICAL TECHNOLOGY (AUTOMOTIVE): GRADE 11 (TERM 3)

TERM 3	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10	WEEK 11	
CAPS TOPICS	SYSTEMS AND CONTROL			MAINTENANCE (SPECIFIC)			FORCES (SPECIFIC)		CONSOLIDATION OF PAT	REVISION AND CONTROLLED TEST		
TOPICS, CONCEPTS, SKILLS, AND VALUES	ELECTRICITY Identify the functions and describe the operation of the conventional ignition system with reference to: <ul style="list-style-type: none"> Ignition coil Firing order Ignition timing Spark plugs 	Purpose, construction, and operation of ignition timing regulators <ul style="list-style-type: none"> Mechanical and Vacuum regulators 	Starting circuit: Show an understanding of the basic starting circuit supplemental systems (purpose and operation): <ul style="list-style-type: none"> Traction control Airbag control 	Engine lubrication oil pumps (purpose and operation): <ul style="list-style-type: none"> Gear Vane Rotor 	Demonstrate an understanding of oil control methods referring to: <ul style="list-style-type: none"> Oil filtration systems Pressure relief valve 	Demonstrate an understanding of oil control <ul style="list-style-type: none"> Seals Servicing of vehicles: Importance of regular servicing 	Automotive calculations and application: <ul style="list-style-type: none"> Work Power Torque 	Compression ratio: Define the following: Compression ratio	Completion of PAT that was done throughout Term 3			
REQUISITE PRE-KNOWLEDGE	Identification and function of engine components		Identification and function of engine components	Properties of lubricants friction, lack of maintenance	Lubrication systems		Types of forces basic calculations					
RESOURCES (OTHER THAN TEXTBOOK) TO ENHANCE LEARNING	Conventional ignition system components (as above) with relative specifications		Batteries, starters, hand tools, YouTube, CDX educational videos, etc.	Different types of oil pumps	Oil filtration systems, vehicle or running engines for servicing		Engines, measuring instruments and specifications Calculators					
ASSESSMENT	INFORMAL ASSESSMENT: REMEDIATION	Classwork, case studies, worksheets, homework, class tests (theory and practical work)										
	SBA & PAT (FORMAL)			PAT Phase 3 controlled test								

2023/24 ANNUAL TEACHING PLANS: MECHANICAL TECHNOLOGY (AUTOMOTIVE): GRADE 11 (TERM 4)

TERM 4	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9-11
CAPS TOPICS	TERMINOLOGY (SPECIFIC)		PRACTICAL: MAINTENANCE			REVISION, CONSOLIDATION AND MODERATION OF PAT			EXAMINATION
TOPICS, CONCEPTS, SKILLS, AND VALUES	Workshop administration • Read and interpret job instructions	Read, interpret and adhere to manufacturers' specifications	Changing disc pads and bleeding of breaks or oil change or engine timing or setting of engine valves						
REQUISITE PRE-KNOWLEDGE	Workshop administration and maintenance								
RESOURCES (OTHER THAN TEXTBOOK)	Sample job cards	Workshop manuals YouTube videos							
FORMAL ASSESSMENT	PAT Phase 4 and final examination								