

QCTO curriculum outline and link to the NOCC – Fitter and Turner

Knowledge Modules

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
652302000-KM-01: Basic engineering, NQF Level 3 (32)	KM-01-KT01: Introduction to the Fitting and Turning Trade (5%)	KT0101 Career opportunities for a qualified fitter and turner		A1
		KT0102 Occupational profile of a fitter and turner		
		KT0103 Legislation related to apprentices in the fitting and turning trade		
	KM-01-KT02: Workplace health, safety and environmental protection (20%)	KT0201 General overview of occupational health and safety legislation		C1
		KT0202 General workshop safety rules		
		No KT0203		
		KT0204 Safety symbols and coding		
		KT0205 Types of personal protective equipment		
		KT0206 Hazard identification and risk assessment principles		
		KT0207 Fundamentals of securing worksites		
		KT0208 Environmental protection and pollution concepts		
	KM-01-KT03: Engineering drawings (10%)	KT0301 Freehand drawing		B1
		KT0302 Code of practice for engineering drawing (symbols and abbreviations)		
		KT0303 Drawing instruments and equipment		
		KT0304 Dimensioning Methods		
KT0305 Isometric Drawings				
KT0306 Assembly and detailed drawings				

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
	KM-01-KT04: Engineering materials (10%)	KT0401 Basic metallurgy and heat concepts		B2, B4
		KT0402 Properties of base metals, alloys and synthetic materials		
		KT0403 Non-ferrous metals and ferrous materials		
	KM-01-KT05: Engineering tools and equipment (15%)	KT0501 Hand tools to hold, assemble or disassemble components		D1
		KT0502 Hand-held cutting tools (saws, blades, files, scrapers, chisels, taps and dies, hand reamers, hand broaching tools, hammers centre punch)		D1
		KT0503 Hand-held power tools (angle grinder, drills, drill bits and reamers)		D2
		KT0504 Measurement tools and equipment (basic measurement tools, precision measuring tools, angular measuring tools, inspection gauges)		D3
		KT0505 Marking-off tools and equipment (punches, scribes, combination sets, protractors, callipers (inside and outside), jenny calliper, engineering square, angle plates, marking-off table, dividers)		D3
	KM-01-KT06: Basic lifting concepts (8%)	KT0601 Rigging (slings, block and tackle, chain block, steel ropes)		C3
		KT0602 Rigging concepts		
		KT0603 Loads selection and limitations		
		KT0604 Safety precautions		
			KT0701 Terminology related to screw threads (pitch, root diameter, nominal diameter, lead,	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
	KM-01-KT07: Types and applications of screw threads (8%)	flank, internal and external threads, helix angle, included angle)		
		KT0702 Screw threads (v-thread, acme, and square threads)		
		KT0703 Application of screw threads		
		KT0704 Thread calculations		
	KM-01-KT08: Types and function of locking devices and fasteners (8%)	KT0801 Fasteners and locking devices (machine screws, set screws, cap screws, grub screw, studs, locking nuts and bolts, washers, circlips, pins, keys)		B4
		KT0802 Application of fasteners and locking devices		
		KT0803 Drawings of fasteners and locking devices		
	KM-01-KT09: Principles, equipment and methods of arc welding, gas cutting, brazing and silver soldering	KT0901 Arc welding and gas cutting equipment and consumables		G1, G2, G3
		KT0902 Arc welding and gas cutting techniques and principles		
		KT0903 Material selection		
		KT0904 Cutting and welding defects		
		KT0905 Safe handling of gas cylinders		
		KT0906 Health and safety risks and protective equipment and measures		
	652302000-KM-02: Fitting theory, NQF Level 4 (38)	KM-02-KT01: Static and dynamic seals and gaskets (8%)	KT010601 Seals and gaskets	
KT010602 The stuffing box and gland (packings)				
KT010603 Lagging pipelines				
KT010603 O-rings				

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
	KM-02-KT02: Types, and application of bearings (8%)	KS0201 Bearings (anti-friction and friction bearings)		K1
		KS0202 Application of bearing		
		KS0203 Maintenance of bearing		
		KS0204 Causes of failures in bearings		
		KS0205 Removal and installation of bearings		
	KM-02-KT03: Types and application of valves (8%)	KT0301 Classification and types of valves (Classification includes linear motion, rotary motion and quarter turn valves and types include gate, non-return, relief, ball shut-off valves. Also included are pipe systems.)		I2, I3
		KT0302 Terminology of valves		
		KT0303 Function and working principle of valves		
		KT0304 Removal and installation of valves		
	KM-02-KT04: Types and application of drives (8%)	KT0401 Drives (direct and indirect)		H2, H4, H5
		KT0402 Terminology of drives		
		KT0403 Functions and working principle of drives		
	KM-02-KT05: Types and application of pumps (8%)	KT0501 Classification of pumps		I1, I3
		KT0502 Terminology of pumps		
		KT0503 Functions and working principles of pumps		
	KM-02-KT06: Mechanical working principles, types and applications of reduction gearboxes (8%)	KT0601 Gearboxes (single reduction, double reduction, variable speed)		H1, H4, H5
		KT0601 Terminology of gearboxes		

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
	KM-02-KT07: Mechanical working principles, types and applications of clutches (8%)	KT0701 Types of clutches		J1, J2
		KT0702 Terminology of clutches		
		KT0703 Functions and working principles of clutches		
		KT0704 Removal and installation procedure for clutches		
	KM-02-KT08: Mechanical working principles, types and applications of brakes (8%)	KT0801 Types of brakes		J1, J2
		KT0802 Terminology of brakes		
		KT0803 Functions and working principles of brakes		
		KT0804 Removal and installation procedures for brakes		
	KM-02-KT09: Mechanical working principles, types and applications of lubrication systems (8%)	KT0901 Lubrication systems and devices		K2, K3
		KT0902 Properties of lubricants		
		KT0903 Terminology of lubrication systems and devices		
		KT0904 Working principles of lubrication systems and devices		
	KM-02-KT10: Mechanical working principles, types and applications of hydraulic systems (8%)	KT1001 Hydraulic systems		L1-L4
		KT1002 Units of measurement in hydraulic systems (pressure, flow rate, area)		
		KT1003 Hydraulic symbols and circuits		
KM-02-KT11: Mechanical working principles, types and applications of pneumatic systems (8%)	KT1101 Pneumatic systems		M1-M4	
	KT1102 Units of measurement in pneumatic systems (pressure, flow rate, area)			
	KT1103 Pneumatic symbols and circuits			

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
	KM-02-KT12: Types and functions of conveyors (6%)	KT1201 Conveyors KT1202 Functions of conveyors		N1-N3
	KM-02-KT13: Diagnostic techniques (6%)	KT1301 Diagnostic equipment KT1302 Diagnostic techniques KT1303 Diagnostic testing		H1-H2, I1-I2, J1-J2, K1-K2, L2, M2
652302000-KM-03: Machining theory, NQF Level 4 (36)	KM-03-KT01: Principles, methods and techniques of fabrication (10%)	KT0101 Machine lubrication and cutting fluids		P1, P4
		KT0102 Speeds, feeds and cutting tools		O2, P1, P4
		KT0103 Taper systems and their applications		P1
		KT0104 Limit and fits		P1
	KM-03-KT02: Principles, methods and techniques of machining work pieces with a centre lathe (30%)	KT0201 Working principles of a centre lathe		O2, O3, P1-6
		KT0202 Terminology and components of a centre lathe		O2, O3, P1-6
		KT0203 Internal and external turning procedures		O2, O3, P1-3, P5-6
		KT0204 Thread cutting		O2, O3, P1-3, P5-6
		KT0205 Taper cutting		O3, P1-3, P5-6
		KT0206 Speeds and feeds		O2, O3, P1-6
KT0207 Tools and tool selection			O1-3, P1-6	
KM-03-KT03: Principles, methods and techniques of	KT0301 Working principles of a milling machine		Q1-4, R1-5	
	KT0302 Terminology and components of a milling machine		Q1-4, R1-5	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
	machining work pieces with a milling machine (25%)	KT0303 Milling machine cutting procedures including drilling and boring, straddle, gang and form milling, T-slots and dovetails, cutting slots, keyways, key seats		Q1, R1-5
		KT0304 Speeds and feeds		Q1, Q4, R1
		KT0305 Tool selection		Q1, Q3, Q4, R1-5
		KT0306 Indexing (dividing head and differential)		Q4, R1-5
	KM-03-KT04: Types and working principles of pedestal grinding machine (10%)	KT0401 Working principles of a pedestal-grinding machine		E4
		KT0402 Grinding machine types, parts and attachments		
		KT0403 Terminology and components		
		KT0404 Wheel selection		
		KT0405 Balancing, mounting and dressing		
	KM-03-KT05: Principles, methods and techniques of machining work pieces with surface and cylindrical grinding machines (25%)	KT0501 Working principles of surface and cylindrical grinding machines		R6
		KT0501 Terminology and components of surface and cylindrical grinding machines		
		KT0501 Off-hand and precision grinding cutting procedures for cylindrical and surface grinding machines		
		KT0501 Speeds and feeds		
		KT0501 Grinding wheel selection, classification, bonding types and wheel markings, profiles		
		KT0501 Grinding faults		

Practical Modules

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
652302000-PM-01: Fabricate simple components or work pieces using basic hand skills and hand tools	PM-01-PS01 Plan and prepare for fabrication of component	No PA0101	AK0101 Procedures to plan and prepare for fabrication of components	E1
		PA0102 List the quality criteria required		
		PA0103 List component specifications including tolerances and sizes from the assignment		
		PA0104 List material, tool and equipment requirements	AK0104 Material Identification, types and profiles	
		PA0105 Describe the sequence of work to fabricate the different components		
		PA0106 Identify and list potential hazards and risks related to the assignments	AK0106 Practices related to quality, health, safety, and protection of the environment	
	PM-01-PS02 Select and care for engineering hand tools	PA0201 Identify and select the different tools required	AK0201 Identification, function, use and care of hand tools	D1
		PA0202 Demonstrate the use the different tools		
		PA0203 Demonstrate cleaning and storing practices of different tools		
		PA0204 Identify potential hazards and risks related to the use of the tools and list appropriate response	AK0106 Practices related to quality, health, safety, and protection of the environment when using hand tools	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
	PM-01-PS03 Select and care for engineering measuring instruments	PA0301 Identify and select the different measuring instruments	AK010301 Identification, reading, calibration, use of and care for measuring instruments	D3
		PA0302 Demonstrate the use the different measuring instruments	AK010302 Safety and procedures	
		PA0303 Clean and store the measuring instruments	AK010303 Procedures for cleaning and storing different measuring instruments	
		PA0304 Check and calibrate measuring instruments	AK010301 Identification, reading, calibration, use of and care for measuring instruments	
	PM-01-PS04 Read, interpret and produce basic engineering drawings	PA0401 Identify and interpret symbols, abbreviations and tolerances on engineering drawings	AK0401 Terms and definitions pertaining to engineering drawings	B1
		PA0402 Identify types of fits	AK0402 Symbols and abbreviations used in drawings	
		PA0403 Identify surface textures	AK0403 Allowance, tolerances and fits	
		PA0404 Draw a free hand sketch	AK0404 Engineering drawings	
		PA0405 Draw an isometric and orthographic drawing		
	PM-01-PS05 Identify engineering materials,	PA010501 Identify the types of engineering materials	AK010501 Types and applications of engineering materials	B2

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
	their characteristics and applications	PA010502 List the characteristics of engineering materials		
		PA010503 List the applications of engineering materials		
	PM-01-PS06 Mark-off various simple components	PA0601 Mark-off a work piece	AK0601 Identification, function, use and care of hand tools	E1
		PA0602 Check measurements and marking-off for accuracy	AK0602 Identification, reading, calibration, use of and care for measuring equipment or instruments	
		No PA0603	AK0603 Terms and definitions of engineering drawings	
		PA0604 Demonstrate adherence to safe and environmentally responsible practices during all the stages of the assignment	AK0604 Symbols and abbreviations used in drawings	
			AK0605 Allowance, tolerances and fits	
			AK0606 Material Identification, types and profiles	
			AK0607 Types and applications of engineering materials	
			AK0608 Procedures and techniques/methods for marking-off	
			AK0609 Practices related to quality, health, safety,	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
			and protection of the environment when marking off components	
	PM-01-PS07 Fabricate and fit a gasket	PA0701 List the quality criteria and specifications required	AK0701 Procedures to plan and prepare for fabrication of gaskets	F1
		PA0702 Select the material, tools and equipment required for the assignment	AK0702 Identification, function, use and care of hand tools for gasket fabrication	
		PA0703 Describe the sequence of work to fabricate the gasket	AK0703 Identification, reading, calibration, use of and care for measuring equipment/instruments	
		PA0704 Identify and list potential hazards and risks related to the assignments	AK0704 Allowance, tolerances and fits	
		PA0706 Mark-off, fabricate and fit the gaskets	AK0705 Types and applications of engineering materials	
		PA0707 Demonstrate adherence to safe and environmentally responsible practices during all the stages of the assignment	AK0706 Types, applications of gaskets, torques prescribed for tightening gaskets	
		PA0701 List the quality criteria and specifications required	AK0707 Practices related to quality, health, safety, and protection of the environment when fabricating and fitting gaskets	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
PM-01-PS08	File work a piece	PA0801 List the quality criteria and specifications required	AK0801 Procedures to plan and prepare for filing of components	E1
		PA0802 Select the material, tools and equipment required for the assignment	AK0802 Identification, function, use of and care for hand tools used in cutting and filing	
		PA0803 Describe the sequence of work to file the work piece	AK0803 Identification, reading, calibration, use and care of measuring equipment/instruments	
		PA0804 Identify and list potential hazards and risks related to the assignments	AK0804 Allowance, tolerances and fits	
		PA0805 Mark-off the work piece	AK0805 Types and applications of engineering materials	
		PA0806 Cut material to size with a hacksaw	AK0806 Procedures to file work pieces	
		PA0807 File the work piece	AK0807 Practices related to quality, health, safety, and protection of the environment when filing work pieces	
		PA0808 Debur and finish off the work piece		
		PA0809 Demonstrate adherence to safe and environmentally responsible practices during all the stages of the assignment		
PM-01-PS09	Saw work piece	PA0901 List the quality criteria and specifications required	AK0901 Procedures to plan and prepare for sawing of components	E1

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0902 Select the material, tools and equipment required for the assignment	AK0902 Identification, function, use of and care for hand tools	
		PA0903 Describe the sequence of work to saw the work piece	AK0903 Identification, reading, calibration, use and care of measuring equipment/instruments	
		PA0904 Identify and list potential hazards and risks related to the assignments	AK0904 Allowance, tolerances and fits	
		PA0905 Mark-off work piece	AK0905 Types and applications of engineering materials	
		PA0906 Saw the work piece with a hacksaw	AK0906 Procedures to saw work pieces	
		PA0907 Debur and finish off the work piece	AK0907 Practices related to quality, health, safety, and protection of the environment when sawing work pieces	
		No PA0908	AK0901 Procedures to plan and prepare for sawing of components	
		PA090 Demonstrate adherence to safe and environmentally responsible practices during all the stages of the assignment		
PM-01-PS10 Fabricate and fit a key	PA1001 List the quality criteria and specifications required	AK1001 Procedures to plan and prepare for fabricating and fitting keys	F2	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA1002 Select the material, tools and equipment required for the assignment	AK1002 Identification, function, use of and care for hand tools	
		PA1003 Describe the sequence of work to fabricate and fit the key	AK1003 Identification, reading, calibration, use and care for measuring equipment/instruments	
		PA1004 Identify and list potential hazards and risks related to the assignments	AK1004 Allowance, tolerances and fits	
		PA1005 Mark-off, fabricate and fit the key	AK1005 Types and applications of different keys	
		PA1006 Conduct post fabrication and fitting activities	AK1006 Procedures to fabricate and fit keys	
		PA1007 Demonstrate adherence to safe and environmentally responsible practices during all the stages of the assignment	AK1007 Practices related to quality, health, safety, and protection of the environment when fabricating and fitting keys	
		PM-01-PS11 Cut threads with stocks, dies and taps	PA1101 Interpret work piece specifications	
		PA1102 Interpret tap and drill charts	AK1102 Identification, function, use of and care for hand tools	
		PA1103 Select hand tools, equipment and lubrication	AK1103 Identification, reading, calibration, use and care for measuring equipment/instruments	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA1104 Cut threads using stocks and dies	AK1104 Allowance, tolerances and fits	
		PA1106 Tap holes	AK1105 Types and applications of different reamers, stocks and dies, and lubricants	
		PA1107 Conduct post fabrication activities	AK1106 Procedures to cut threads using stocks and dies	
		PA1108 Demonstrate adherence to safe and environmentally responsible practices during all the stages of the assignment	AK1107 Procedures to ream holes	
			AK1108 Procedures to tap holes	
			AK1109 Practices related to quality, health, safety, and protection of the environment when cutting threads, tapping and reaming holes	
	PM-01-PS12 Ream parallel and tapered holes	PA1201 Interpret work piece specifications	AK1201 Procedures to plan and prepare for reaming holes	E5
		PA1202 Interpret reaming charts	AK1202 Identification, function, use of and care for hand tools	
		PA1203 Select hand tools, equipment and lubrication	AK1203 Identification, reading, calibration, use and care for measuring equipment/instruments	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA1204 Ream holes	AK1204 Allowance, tolerances and fits	
		PA1205 Conduct post fabrication activities	AK1205 Types and applications of different reamers, stocks and dies, and lubricants	
		PA1206 Demonstrate adherence to safe and environmentally responsible practices during all the stages of the assignment	AK1206 Procedures to ream holes using reamers	
			AK1207 Practices related to quality, health, safety, and protection of the environment when cutting treads, tapping and reaming holes	
652302000-PM-02: Fabricate components or work pieces using power tools or equipment	PM-02-PS01 Select and care for engineering power tools	PA0101 Identify and select the different power tools	AK0101 Identification, function, use and care of power tools	D2
		PA0102 Demonstrate the start-up and shut down procedures of the different tools	AK0106 Practices related to quality, health, safety, and protection of the environment when using power tools	
		PA0103 Demonstrate cleaning procedures and storage of the different tools		
		PA0104 Identify potential hazards and risks related to the use of the tools and list appropriate response		

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
	PM02-PS02 Select and care for engineering machines	PA0201 Identify and select the different machines	AK0201 Identification, function, use and care of engineering machines	D2, O2
		PA0202 Demonstrate start-up and shut down procedures of the different machines	AK0202 Practices related to quality, health, safety, and protection of the environment when using engineering machines	
		PA0203 Demonstrate cleaning procedures the different machines		
		PA0204 Identify potential hazards and risks related to the use of the machines and list appropriate response		
	PM-02-PS03 Grind material to specifications using a pedestal grinder	PA020301 Plan and prepare to grind work pieces	AK020301 Identification, function, use of and care for grinding power tools and machines	E4, O1
		PA020302 Select grinding wheel to match grinding assignment	AK020302 Procedures to grind work pieces using a grinding power tools and machines	E4, O1
		PA020303 Remove and replace grinding wheels	AK020303 Methods to dress grinding wheels	
		PA020304 Dress grinding wheels	AK020304 Grinding safety precautions	
		PA020305 Set-up pedestal grinder and set tool rest		
		PA020306 Grind drill bits, high speed steel tool bits and chisels		

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA020307 Use a pedestal grinder in a safe and responsible manner		
	PM-02-PS04 Drill material to specifications using a portable drilling machine	PA0401 Plan and prepare to drill holes using a portable drilling machine	AK0401 Identification, function, use of and care for portable drilling machine	E2
		PA0402 Interpret work piece specifications	AK0402 Procedures to drill holes using a portable drilling machine	
		PA0403 Select, prepare and handle material	AK0403 Methods to sharpen drill bits	
		PA0404 Select and use lubricants/coolants	AK0404 Drill speeds, lubricants/coolants	
		PA0405 Mark-off work piece		
		PA0406 Select, inspect and sharpen drill bits		
		PA0407 Set-up portable drilling machine and work piece		
		PA0408 Drill and debur holes		
		PA0409 Clean and store		
		PA0410 Use a portable drilling machine in a safe and responsible manner		
	PM-02-PS05 Drill material to specifications using a fixed drilling machine	PA0501 Plan and prepare to drill holes using a fixed drilling machine	AK0501 Identification, function, use and care of fixed drilling machine	E2
		PA0502 Identify hazards and risks and use fixed drilling machines in a safe and responsible manner	AK0502 Procedures to drill holes using a fixed drilling machine	
		PA0503 Interpret work piece specifications	AK0503 Methods to sharpen drill and tool bits	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0504 Select, prepare and handle material	AK0504 Drill speeds, lubricants/coolants	
		PA0505 Select and use lubricants/coolants		
		PA0506 Mark-off work piece		
		PA0507 Select, inspect and sharpen drill bits		
		PA0508 Set-up fixed drilling machine and work piece		
		PA0509 Calculate and set speeds and feeds		
		PA0510 Drill and debur holes		
		PA0511 Lock out, clean the drill and remove and store all attachments		
		PA0512 Use a fixed drilling machine in a safe and responsible manner		
	PM-02-PS06 Arc weld metal to specification	PA0601 Select welding rods required	AK0601 Identification, function, use of and care of arc welding equipment	G2
		PA0602 Set-up arc welding machine and work piece	AK0602 Procedures to arc weld work pieces using an arc-welding machine	
		PA0603 Perform a fillet weld in the flat position (1F), including fitting and tacking	AK0603 Methods and different arc welding positions	
		PA0604 Perform a fillet weld in the horizontal position (2F), including fitting and tacking	AK0604 Arc welding safety colour markings and symbols	
		PA0605 Perform a fillet weld in the vertical up position (3F), including fitting and tacking	AK0605 Arc welding safety precautions	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0606 Use a arc-welding machine in a safe and responsible manner	AK0606 Fitting and tack welding techniques and practices	
		PA0607 Conduct post welding activities		
	PM-02-PS07 Gas weld, silver solder and braze metal to specification	PA0601 Set-up gas welding equipment and work piece	AK0601 Identification, function, use of and care for gas welding equipment	G3
		PA0602 Use gas welding equipment in a safe and responsible manner	AK0602 Procedures to gas weld work pieces using gas-welding equipment	
		PA0603 Adjust the flame and pressure settings	AK0603 Gas welding safety colour markings and symbols	
		PA0604 Perform gas welds, silver soldering and brazing	AK0604 Methods to gas weld	
		PA0605 Conduct post gas welding activities	AK0605 Gas welding safety precautions	
	PM-02-PS08 Gas cut metal to specification	PA0801 Mark-off work piece	AK0801 Identification, function, use of and care for gas cutting equipment	G1
		PA0802 Set-up gas cutting equipment and work piece	AK0802 Procedures to gas cut work pieces using gas cutting equipment	
		PA0803 Conduct post gas cutting activities	AK0803 Gas cutting methods	
			AK0804 Gas cutting safety precautions	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
	PM-02-PS09 Saw material to specification mechanical saw	PA0901 Interpret work piece specifications, material and blade types	AK0901 Identification, function, use of and care for power saw	E1
		PA0902 Mark-off and secure the work piece	AK0902 Procedures to saw work pieces using power saw	
		PA0903 Set-up power saw, speeds and feeds,	AK0903 Methods to saw work piece	
		PA0904 Use a power saw in a safe and responsible manner	AK0904 Sawing safety precautions	
		PA0905 Lock-out, clean, remove and store materials		
652302000-PM-03: Disassemble, clean and inspect mechanical sub-assemblies, NQF Level 3 (6)	PM-03-PS01 Plan and prepare disassembly of sub-assembly	PA0101 Read and explain the assignment specifications and quality requirements	AK0101 Procedures to plan and prepare for disassembling sub-assemblies	H1
		PA0102 Identify sub-assembly components and specifications	AK0102 Identification, function, use of and care for tools, power tools, and machinery	
		PA0103 Identify tools, power tools and equipment requirements	AK0103 Identification, reading, calibration, use of and care for measuring equipment or instruments	
		PA0104 Plan the sequence of work to disassemble sub-assemblies	AK0104 Practices related to quality, health, safety and environmental protection	
		PA0105 Identify potential hazards and risks related to the job and list the appropriate		

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		responses for each of the practical assignments		
	PM-03-PS02 Disassemble, clean and inspect gearbox	PA0201 Plan and prepare workplace for disassembling gearbox	AK0201 Procedures to disassemble clean and inspect a gearbox	H1
		PA0202 Identify potential hazards and risks related to the job and list the appropriate responses	AK0202 Original Equipment Manufacturer gearbox specifications	
		PA0203 Select tools and cleaning materials	AK0203 Lubricants, gasket material	
		PA0204 Drain and visually inspect condition of oil	AK0204 Components and components' numbers of a gearbox	
		PA0205 Disassemble and record gearbox component or part numbers and specifications (including floats)	AK0205 Signs and causes of wear or damage or failure or defect in components	
		PA0206 Clean gearbox components	AK0206 Safe handling and storage of components	
		PA0207 Visually inspect component condition (wear, damage, defect, failure) according to Original Equipment Manufacturer (OEM) specifications		
		PA0208 Conduct post-disassembling activities		
	PM-03-PS03 Disassemble, clean and inspect pump	PA0301 Plan and prepare workplace for disassembling a pump	AK0301 Procedures to disassemble, clean and inspect a pump	I1

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0302 Identify potential hazards and risks related to the job and list the appropriate responses	AK0302 Original Equipment Manufacturer pump specifications	
		PA0303 Select tools and cleaning materials	AK0303 Components of a pump and components' numbers	
		PA0304 Disassemble and record pump component or part numbers and specifications	AK0304 Signs and causes of wear or damage or failure or defect in components	
		PA0305 Clean pump components	AK0305 Safe handling and storage of components	
		PA0306 Visually inspect component condition (wear, damage, defect, failure) according to Original Equipment Manufacturer specifications		
		PA0307 Conduct post-disassembling activities		
	PM-03-PS04 Disassemble, clean and inspect a brake	PA0401 Plan and prepare workplace for disassembling a brake	AK0401 Procedures to disassemble, clean and inspect a brake	J1
		PA0402 Identify potential hazards and risks related to the job and list the appropriate responses	AK0402 Original Equipment Manufacturer brake specifications	
		PA0403 Select tools and cleaning materials	AK0403 Components and components' numbers of a brake	
		PA0404 Disassemble and record brake component or part numbers and specifications	AK0404 Signs and causes of wear or damage or failure or defect in components	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0405 Clean brake components	AK0405 Safe handling and storage of components	
		PA0406 Visually inspect component condition (wear, damage, defect, failure) according to Original Equipment Manufacturer specifications		
		PA0407 Conduct post-disassembling activities		
	PM-03-PS05 Disassemble, clean and inspect a clutch	PA0501 Plan and prepare workplace for disassembling a clutch	AK0501 Procedures to disassemble, clean and inspect a clutch	J1
		PA0502 Identify potential hazards and risks related to the job and list the appropriate responses	AK0502 Original Equipment Manufacturer clutch specifications	
		PA0503 Select tools and cleaning materials	AK0503 Components of a clutch and components' numbers	
		PA0504 Disassemble and record clutch component or part numbers and specifications	AK0504 Signs and causes of wear or damage or failure or defect in components	
		PA0505 Clean clutch components	AK0505 Safe handling and storage of components	
		PA0506 Visually inspect component condition (wear, damage, defect, failure) according to Original Equipment Manufacturer specifications		
		PA0507 Conduct post-disassembling activities		
	PA0601 Plan and prepare workplace for disassembling direct and indirect drives	AK0601 Procedures to disassemble, clean and	H2	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
	PM-03-PS06 Disassemble, clean and inspect a drive		inspect direct and indirect drives	
		PA0602 Identify potential hazards and risks related to the job and list the appropriate responses	AK0602 Original Equipment Manufacturer direct and indirect drive specifications	
		PA0603 Select tools and cleaning materials	AK0603 Components of direct and indirect drives	
		PA0604 Disassemble and record direct and indirect drive components or parts' numbers and specifications	AK0604 Signs and causes of wear or damage or failure or defect in components	
		PA0605 Clean components of direct and indirect drives	AK0605 Safe handling and storage of components	
		PA0606 Visually inspect component condition (wear, damage, defect, failure) according to Original Equipment Manufacturer specifications		
		PA0607 Conduct post-disassembling activities		
	PM-03-PS07 Remove and inspect a bearing	PA0701 Plan and prepare workplace for removing a bearing	AK0701 Procedures to remove and inspect a bearing	K1
		PA0702 Identify potential hazards and risks related to the job and list the appropriate responses	AK0702 Original Equipment Manufacturer bearing specifications	
		PA0703 Select tools and cleaning materials	AK0703 Signs and causes of wear or damage or failure or defect in components	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0704 Disassemble bearing unit or housing	AK0704 Safe handling and storage of bearings	
		PA0705 Remove bearing and record bearing part numbers and specifications		
		PA0706 Clean bearing components		
		PA0707 Visually inspect bearing condition (wear, damage, defect, failure) according to Original Equipment Manufacturer specifications		
		PA0708 Conduct post-removal and inspection activities		
	PM-03-PS08 Clean and inspect a lubrication system	PA0801 Plan and prepare for cleaning and inspecting a lubrication system	AK0801 Procedures to clean and inspect a lubrication system	K2
		PA0802 Identify potential hazards and risks related to the job and list the appropriate responses	AK0802 Original Equipment Manufacturer specifications for a lubrication system	
		PA0803 Select tools and cleaning materials	AK0803 Components of a lubrication system	
		PA0804 Clean a lubrication system	AK0804 Signs and causes of leaks or wear or damage or failure or defects	
		PA0805 Visually inspect a lubrication system for leaks, wear, damage, defects, and failures according to Original Equipment Manufacturer specifications	AK0805 Types and applications of lubrication systems	
		PA0806 Conduct post-cleaning and inspecting activities		

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
	PM-03-PS09 Clean and inspect a hydraulic system	PA0901 Plan and prepare for cleaning and inspecting a hydraulic system	AK0901 Procedures to clean and inspect a hydraulic system	L2
		PA0902 Identify potential hazards and risks related to the job and list the appropriate responses	AK0902 Original Equipment Manufacturer specifications for a hydraulic system	
		PA0903 Select tools and cleaning materials	AK0903 Components of a hydraulic system	
		PA0904 Clean a hydraulic system	AK0904 Signs and causes of leaks or wear or damage or failure or defects	
		PA0905 Visually inspect a hydraulic system for leaks, wear, damage, defects, and failures according to Original Equipment Manufacturer specifications	AK0905 Types and applications of hydraulic systems	
		PA0906 Conduct post-cleaning and inspecting activities		
	PM-03-PS10 Clean and inspect a pneumatic system	PA1001 Plan and prepare for cleaning and inspecting a pneumatic system	AK1001 Procedures to clean and inspect a pneumatic system	M2
		PA1002 Identify potential hazards and risks related to the job and list the appropriate responses	AK1002 Original Equipment Manufacturer specifications for a pneumatic system	
		PA1003 Select tools and cleaning materials	AK1003 Components of a pneumatic system	
		PA1004 Clean a pneumatic system	AK1004 Signs and causes of leaks or wear	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
			or damage or failure or defects	
		PA1005 Visually inspect a pneumatic system for leaks, wear, damage, defects, and failures according to Original Equipment Manufacturer specifications	AK1005 Types and applications of pneumatic systems	
	PM-03-PS11 Disassemble, clean and inspect a valve	PA1101 Plan and prepare workplace for disassembling a valve	AK1101 Procedures to disassemble, clean and inspect a valve	I2
		PA1102 Identify potential hazards and risks related to the job and list the appropriate responses	AK1102 Original Equipment Manufacturer valve specifications	
		PA1103 Select tools and cleaning materials	AK1103 Types and applications of valves	
		PA1104 Disassemble and record valve component or part numbers and specifications	AK1104 Components and components' numbers of a valve	
		PA1105 Clean a valve	AK1105 Signs and causes of wear or damage or failure or defect in components	
652302000-PM-04: Replace components and assemble mechanical sub-assemblies and machines, NQF Level 3 (6)	PM-04-PS01 Replace gearbox components and assemble a gearbox	PA0101 Plan and prepare for replacement of gearbox components and assembly of a gearbox	AK0101 Procedures to replace and assemble a gearbox	H1
		PA0102 Identify potential hazards and risks related to the job and list the appropriate responses	AK0102 Original Equipment Manufacturer gearbox specifications	
		PA0103 Select tools, materials, equipment and lubricants	AK0103 Types and applications of gearboxes	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0104 Replace worn, damaged, defective components or parts	AK0104 Types and applications of lubricants	
		PA0105 Assemble, set and record gearbox components or parts' numbers and specifications (including floats)	AK0105 Gearbox lubrication procedures	
		PA0106 Lubricate components		
		PA0107 Conduct post-assembly activities		
	PM-04-PS02 Replace pump components and assemble a pump	PA0201 Plan and prepare for replacement of pump components and assembly of a pump	AK0201 Procedures to replace and assemble a pump	I1
		PA0202 Identify potential hazards and risks related to the job and list the appropriate responses	AK0202 Original Equipment Manufacturer pump specifications	
		PA0203 Select tools, materials, equipment and lubricants	AK0203 Types and applications of pumps	
		PA0204 Replace worn, damaged, defective components or parts	AK0204 Types and applications of lubricants	
		PA0205 Assemble, set and record pump components or parts' numbers and specifications	AK0205 Pump lubrication procedures	
		PA0206 Check and lubricate a pump	AK0206 Pump components and applications	
		PA0207 Conduct post-assembly activities		
	PM-04-PS03 Replace brake components and assemble a brake	PA0301 Plan and prepare for replacement of brake components and assembly of a brake	AK0301 Procedures to replace, assemble and set a brake	J1
		PA0302 Identify potential hazards and risks related to the job and list the appropriate responses	AK0302 Original Equipment Manufacturer brake specifications	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0303 Select tools, materials and equipment	AK0303 Types and applications of brakes	
		PA0304 Replace worn, damaged, defective components or parts	AK0304 Brake components and applications	
		PA0305 Assemble, set and record brake components or parts' numbers and specifications	AK0301 Procedures to replace, assemble and set a brake	
		PA0306 Conduct post-assembly activities		
	PM-04-PS04 Replace clutch components and assemble a clutch	PA0401 Plan and prepare for replacement of clutch components and assembly of a clutch	AK0401 Procedures to replace, assemble and set a clutch	J1
		PA0402 Identify potential hazards and risks related to the job and list the appropriate responses	AK0402 Original Equipment Manufacturer clutch specifications	
		PA0403 Select tools, materials and equipment	AK0403 Types and applications of clutch	
		PA0404 Replace worn, damaged, defective components or parts	AK0404 Clutch components and applications	
		PA0405 Assemble, set and record clutch component or part numbers and specifications		
		PA0406 Conduct post-assembly activities		
	PM-04-PS05 Replace drive components and assemble a drive	PA0501 Plan and prepare for replacement of direct and indirect drive components and assembly of direct and indirect drives	AK0501 Procedures to replace components of direct and indirect drives and assembly of direct and indirect drives	H2

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0502 Identify potential hazards and risks related to the job and list the appropriate responses	AK0502 Direct and indirect drive Original Equipment Manufacturer specifications	
		PA0503 Select tools, materials and equipment	AK0503 Types and applications of direct and indirect drives	
		PA0504 Replace worn, damaged, defective components or parts	AK0504 Direct and indirect drives components and applications	
		PA0505 Assemble and record direct and indirect drive component or part numbers and specifications	AK0505 Direct and indirect drive lubrication procedures	
		PA0506 Check and lubricate drives		
		PA0507 Conduct post-assembly activities		
	PM-04-PS06 Replace a bearing	PA0601 Plan and prepare for replacing a bearing	AK0601 Procedures to replace a bearing	K1
		PA0602 Identify potential hazards and risks related to the job and list the appropriate responses	AK0602 Original Equipment Manufacturer bearing specifications	
		PA0603 Select tools, materials and equipment	AK0603 Types and applications of bearings	
		PA0604 Replace or mount and set a bearing according to specifications	AK0604 Bearing lubrication procedures	
		PA0605 Lubricate a bearing		
		PA0606 Conduct post-assembly activities		
	PM-04-PS07 Replace lubrication components	PA0701 Plan and prepare for replacing components of a lubrication system and for assembling a lubrication system	AK0701 Procedures to replace lubrication system components	K2

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
	and assemble a lubrication system	PA0702 Identify potential hazards and risks related to the job and list the appropriate responses	AK0702 Procedures to assemble a lubrication system	
		PA0703 Select tools, materials, equipment and lubricants	AK0703 Types and applications of lubrication systems and specifications	
		PA0704 Replace worn, damaged, defective components or parts	AK0704 Lubrication system components and applications	
		PA0705 Assemble, set and record lubrication component or parts' numbers and specifications	AK0705 Types and applications of lubricants	
		PA0706 Check and fill lubricant	AK0706 Environmental risks associated with lubricants	
		PA0707 Conduct post-assembly activities		
	PM-04-PS08 Replace hydraulic components and assemble a hydraulic system	PA0801 Plan and prepare for replacing hydraulic system components and assembling a hydraulic system	AK0801 Procedures to replace hydraulic system components	L2
		PA0802 Identify potential hazards and risks related to the job and list the appropriate responses	AK0802 Procedures to assemble a hydraulic system	
		PA0803 Select tools, materials, equipment and hydraulic fluids	AK0803 Applications of hydraulic systems and specifications	
		PA0804 Replace worn, damaged, defective components or parts	AK0804 Hydraulic system components and applications	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0805 Assemble, set and record hydraulic components or parts' numbers and specifications	AK0805 Types and applications of hydraulic fluids	
		PA0806 Check and fill hydraulic fluids		
		PA0807 Conduct post-assembly activities		
	PM-04-PS09 Replace pneumatic components and assemble a pneumatic system	PA0901 Plan and prepare for replacing components of a pneumatic system and for assembling a pneumatic system	AK0901 Procedures to replace pneumatic system components	M2
		PA0902 Identify potential hazards and risks related to the job and list the appropriate responses	AK0902 Procedures to assemble a pneumatic system	
		PA0903 Select tools, materials and equipment	AK0903 Types and applications of pneumatic systems and specifications	
		PA0904 Replace worn, damaged, defective components or parts	AK0904 Pneumatic system components and application	
		PA0905 Assemble, set and record pneumatic component or part numbers and specifications		
		PA0906 Conduct post assembly activities		
	PM-04-PS10 Replace valve components and assemble a valve	PA1001 Plan and prepare for replacement of valve components and assembly of a valve	AK1001 Procedures to replace and assemble a valve	I2
		PA1002 Identify potential hazards and risks related to the job and list the appropriate responses	AK1002 Original Equipment Manufacturer valve specifications	
		PA1003 Select tools, materials and equipment	AK1003 Types and applications of valves	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA1004 Replace worn, damaged, defective components or parts	AK1004 Valve components and applications	
		PA1005 Assemble, set and record valve component or part numbers and specifications		
		PA1006 Conduct post-assembly activities		
		PA1001 Plan and prepare for replacement of valve components and assembly of a valve		
		PA1002 Identify potential hazards and risks related to the job and list the appropriate responses		
652302000-PS-05: Do fault finding on mechanical sub-assemblies and machines, NQF Level 4 (12)	PM-05-PS01: Do fault-finding on a gearbox	PA0101 Identify potential hazards and risks related to the job and list the appropriate responses	AK0101 Procedures to do fault-finding on a gearbox	H1
		PA0102 Inspect or assess gearbox condition using senses	AK0102 Gearbox Original Equipment Manufacturer (OEM) specifications	
		PA0103 Inspect or assess gearbox condition using diagnostic equipment	AK0103 Signs, symptoms and causes of gearbox faults	
		PA0104 Identify possible faults	AK0104 Types of gearbox faults	
		PA0105 Determine corrective actions and options for dealing with identified faults	AK0105 Possible corrective actions and options to repair gearbox faults	
	PA0106 Report gearbox faults or defects			
	PM-05-PS02 Do fault-finding on pumps	PA0201 Identify potential hazards and risks related to the job and list the appropriate responses	AK0201 Procedures to diagnose pump problems	I1

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0202 Visually inspect or assess pump condition	AK0202 Procedures to do fault-finding on pump	
		PA0203 Identify possible faults	AK0203 Original Equipment Manufacturer (OEM) specifications for pumps	
		PA0204 Determine corrective actions and options for dealing with identified faults	AK0204 Signs, symptoms and causes of faults	
		PA0205 Report pump faults or defects	AK0205 Types of pump faults	
		PA0206 Conduct post-diagnosis and fault-finding activities	AK0206 Possible corrective actions and options to repair faults	
	PM-05-PS03 Do fault-finding on a brake	PA0301 Identify potential hazards and risks related to the job and list the appropriate responses	AK0301 Procedures to diagnose brake problems	J1
		PA0302 Visually inspect or assess brake condition	AK0302 Procedures to do fault-finding on a brake	
		PA0303 Identify possible faults	AK0303 Original Equipment Manufacturer (OEM) specifications for a brake	
		PA0304 Determine corrective actions and options for dealing with identified faults	AK0304 Signs, symptoms and causes of faults	
		PA0305 Report faults or defects on brake	AK0305 Types of break faults	
		PA0306 Conduct post-diagnosis and fault-finding activities	AK0306 Possible corrective actions and options to repair faults	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
	PM-05-PS04 Do fault-finding on a clutch	PA0401 Identify potential hazards and risks related to the job and list the appropriate responses	AK0401 Procedures to diagnose clutch problems	J1
		PA0402 Visually inspect or assess clutch condition	AK0402 Procedures to do fault-finding on brakes and clutches	
		PA0403 Identify possible faults	AK0403 Original Equipment Manufacturer specifications for a clutch	
		PA0404 Determine corrective actions and options for dealing with identified faults	AK0404 Signs, symptoms and causes of faults	
		PA0405 Report faults or defects on a clutch	AK0405 Types of clutch faults	
		PA0406 Conduct post-diagnosis and fault-finding activities	AK0406 Possible corrective actions and options to repair faults	
	PM-05-PS05 Do fault-finding on a drive	PA0501 Identify potential hazards and risks related to the job and list the appropriate responses	AK0501 Procedures to diagnose problems with direct and indirect drive	H2
		PA0502 Visually inspect or assess condition of direct and indirect drives	AK0502 Procedures to do fault-finding on direct and indirect drives	
		PA0503 Identify possible faults	AK0503 Original Equipment Manufacturer specifications for direct and indirect drive	
		PA0504 Determine corrective actions and options for dealing with identified faults	AK0504 Signs, symptoms and causes of faults on drives	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0505 Report faults or defects on direct and indirect drives	AK0505 Types of drive faults	
		PA0506 Conduct post-diagnosis and fault-finding activities	AK0506 Possible corrective actions and options to repair faults	
	PM-05-PS06 Do fault-finding on a bearing	PA0601 Identify potential hazards and risks related to the job and list the appropriate responses	AK0601 Procedures to diagnose bearing problems	K1
		PA0602 Visually inspect or assess bearing condition	AK0602 Procedures to do fault-finding on bearings	
		PA0603 Identify possible faults	AK0603 Original Equipment Manufacturer specifications for bearing	
		PA0604 Determine corrective actions and options for dealing with identified faults	AK0604 Signs, symptoms and causes of faults on bearings	
		PA0605 Report faults or defects on bearing	AK0605 Types of bearing faults	
		PA0606 Conduct post-diagnosis and fault-finding activities	AK0606 Possible corrective actions and options to repair faults	
	PM-05-PS07 Do fault-finding on a lubrication system	PA0701 Identify potential hazards and risks related to the job and list the appropriate responses	AK0701 Procedures to diagnose lubrication system problems	K2
		PA0702 Visually inspect or assess lubrication system condition	AK0702 Procedures to do fault-finding on a lubrication system	
		PA0703 Identify possible faults	AK0703 Original Equipment Manufacturer	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation	
			specifications for a lubrication system		
		PA0704 Determine corrective actions and options for dealing with identified faults	AK0704 Signs, symptoms and causes of faults on lubrication systems		
		PA0705 Report faults or defects on a lubrication system	AK0705 Types of lubrication system faults		
		PA0706 Conduct post-diagnosis and fault-finding activities	AK0706 Possible corrective actions and options to repair faults		
	PM-05-PS08 Do fault-finding on a hydraulic system	PA0801 Identify potential hazards and risks related to the job and list the appropriate responses	AK0801 Procedures to diagnose hydraulic system problems	L2	
		PA0802 Visually inspect or assess hydraulic system condition	AK0802 Procedures to do fault-finding on a hydraulic system		
		PA0803 Identify possible faults	AK0803 Original Equipment Manufacturer specifications for a hydraulic system		
		PA0804 Determine corrective actions and options for dealing with identified faults	AK0804 Signs, symptoms and causes of faults on hydraulic systems		
		PA0805 Report faults or defects on a hydraulic system	AK0805 Types of hydraulic system faults		
		PA0806 Conduct post-diagnosis and fault-finding activities	AK0806 Possible corrective actions and options to repair faults		

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
	PM-05-PS09 Do fault-finding on a pneumatic system	PA0901 Identify potential hazards and risks related to the job and list the appropriate responses	AK0901 Procedures to diagnose pneumatic system problems	M2
		PA0902 Visually inspect or assess pneumatic system condition	AK0902 Procedures to do fault-finding on a pneumatic system	
		PA0903 Identify possible faults	AK0903 Original Equipment Manufacturer specifications for a pneumatic system	
		PA0904 Determine corrective actions and options for dealing with identified faults	AK0904 Signs, symptoms and causes of faults on pneumatic systems	
		PA0905 Report faults or defects on pneumatic system	AK0905 Types of pneumatic system faults	
		PA0906 Conduct post-diagnosis and fault-finding activities	AK0906 Possible corrective actions and options to repair faults	
652302000-PM-06: Repair mechanical sub-assemblies and machines, NQF Level 4 (12)	PM-06-PS01 Repair a gearbox	PA0101 Read and interpret the practical assignments on specific repairs required	AK0101 Procedures for repairing a gearbox	H1
		PA0102 Read and interpret the standard repair specifications and quality requirements from the manufacturer	AK0102 Safety practices and procedures	
		PA0103 Identify gearbox components, parts, seals, lubricants and specifications of these that must be available for repair	AK0103 Gearbox disassembly and assembly procedures	
		PA0104 Plan the sequence of work to repair the gearbox	AK0104 Gearbox component replacement procedures	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0105 Identify potential hazards and risks related to the job and list the appropriate responses	AK0105 Lubricants, seals and part specifications and parts' numbers	
		PA0106 Identify, select and use the required hand tools, power tools and equipment	AK0106 Use of and care for tools and equipment	
		PA0107 Disassemble the gearbox following the specified procedure	AK0107 Post repair activities	
		PA0108 Inspect components and parts and confirm required repairs		
		PA0109 Replace components or parts following the specified procedure		
		PA0110 Reassemble the gearbox following the specified procedure		
		PA0111 Check and confirm that repairs have resolved the problem or fault		
		PA0112 Conduct post repair activities		
	PM-06-PS 02 Repair a pump	PA0201 Read and interpret the practical assignments on specific repairs required	AK0201 Procedures for repairing a pump	I1
		PA0202 Read and interpret the standard repair specifications and quality requirements from the manufacturer	AK0202 Safety practices and procedures	
		PA0203 Identify components, parts, seals, lubricants and specifications of these that must be available for repair	AK0203 Pump disassembly and assembly procedures	
		PA0204 Plan the sequence of work to repair the pump	AK0204 Pump component replacement procedures	
		PA0205 Identify potential hazards and risks related to the job and list the appropriate responses	AK0205 Lubricants, seals and part specifications and parts' numbers	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0206 Identify, select and use the required hand tools, power tools and equipment	AK0206 Use of and care for tools and equipment	
		PA0207 Disassemble the pump following the specified procedure	AK0207 Post repair activities	
		PA0208 Inspect components and parts and confirm required repairs		
		PA0209 Replace components or parts following the specified procedure		
		PA0210 Reassemble the pump following the specified procedure		
		PA0211 Check and confirm that repairs have resolved the problem or fault		
		PA0212 Conduct post-repair activities		
	PM-06-PS 03 Repair a brake	PA0301 Read and interpret the practical assignments on specific repairs required	AK0301 Procedures for repairing a brake	J1
		PA0302 Read and interpret the standard repair specifications and quality requirements from the manufacturer	AK0302 Safety practices and procedures	
		PA0303 Identify components, parts, seals, lubricants and specifications of these that must be available for repair	AK0303 brake disassembly and assembly procedures	
		PA0304 Plan the sequence of work to repair the brake	AK0304 brake component replacement procedures	
		PA0305 Identify potential hazards and risks related to the job and list the appropriate responses	AK0305 Lubricants, seals and part specifications	
		PA0106 Identify, select and use the required hand tools, power tools and equipment	AK0306 Use of and care for tools and equipment	
		PA0307 Disassemble the brake following the specified procedure	AK0307 Post repair activities	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0308 Inspect components and parts and confirm required repairs		
		PA0309 Replace components or parts following the specified procedure		
		PA0310 Reassemble the brake following the specified procedure		
		PA0311 Check and confirm that repairs have resolved the problem or fault		
		PA0312 Conduct post-repair activities		
	PM-06-PS 04 Repair a clutch	PA0401 Read and interpret the practical assignments on specific repairs required	AK0401 Procedures for repairing a clutch	J1
		PA0402 Read and interpret the standard repair specifications and quality requirements from the manufacturer	AK0402 Safety practices and procedures	
		PA0403 Identify components, parts, seals, lubricants and specifications of these that must be available for repair	AK0403 Clutch disassembly and assembly procedures	
		PA0404 Plan the sequence of work to repair the clutch	AK0404 Clutch component replacement procedures	
		PA0405 Identify potential hazards and risks related to the job and list the appropriate responses	AK0405 Lubricants, seals and part specifications and parts' numbers	
		PA0406 Identify, select and use the required hand tools, power tools and equipment	AK0406 Use of and care for tools and equipment	
		PA0407 Disassemble the clutch following the specified procedure	AK0407 Post repair activities	
		PA0408 Inspect components and parts and confirm required repairs		

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0409 Replace components or parts following the specified procedure		
		PA0410 Reassemble the clutch following the specified procedure		
		PA0411 Check and confirm that repairs have resolved the problem or fault		
		PA0412 Conduct post-repair activities		
	PM-06-PS 05 Repair a drive	PA0501 Read and interpret the practical assignments on specific repairs required	AK0501 Procedures for repairing a drive	H2
		PA0502 Read and interpret the standard repair specifications and quality requirements from the manufacturer	AK0502 Safety practices and procedures	
		PA0503 Identify components, parts, seals, lubricants and specifications of these that must be available for repair	AK0503 Drive disassembly and assembly procedures	
		PA0504 Plan the sequence of work to repair the drive	AK0504 Drive component replacement procedures	
		PA0505 Identify potential hazards and risks related to the job and list the appropriate responses	AK0505 Lubricants, seals and part specifications and parts' numbers	
		PA0506 Identify, select and use the required hand tools, power tools and equipment	AK0506 Use of and care for tools and equipment	
		PA0507 Disassemble the drive following the specified procedure	AK0507 Post repair activities	
		PA0508 Inspect components and parts and confirm required repairs		
		PA0509 Replace components or parts following the specified procedure		
		PA0510 Reassemble the drive following the specified procedure		

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0511 Check and confirm that repairs have resolved the problem or fault		
		PA0512 Conduct post-repair activities		
	PM-06-PS 06: Repair a lubrication system	PA0601 Read and interpret the practical assignments on specific repairs required	AK0601 Procedures for repairing a lubrication system	K2
		PA0602 Read and interpret the standard repair specifications and quality requirements from the manufacturer	AK0602 Safety practices and procedures	
		PA0603 Identify components, parts, seals, lubricants and specifications of these that must be available for repair	AK0603 Lubrication system disassembly and assembly procedures check	
		PA0604 Plan the sequence of work to repair the lubrication system	AK0604 Lubrication system component replacement procedures	
		PA0605 Identify potential hazards and risks related to the job and list the appropriate responses	AK0605 Lubricants, seals and part specifications and parts' numbers	
		PA0606 Identify, select and use the required hand tools, power tools and equipment	AK0606 Use and care for tools and equipment	
		PA0607 Disassemble the lubrication system following the specified procedure	AK0607 Post repair activities	
		PA0608 Inspect components and parts and confirm required repairs		
		PA0609 Replace components or parts following the specified procedure		
		PA0610 Reassemble the lubrication system following the specified procedure		
		PA0611 Check and fill lubricant if required		

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0612 Check and confirm that repairs have resolved the problem or fault		
		PA0613 Conduct post-repair activities		
	PM-06-PS 07: Repair a hydraulic system	PA0701 Read and interpret the practical assignments on specific repairs required	AK0701 Procedures for repairing a hydraulic system	L2
		PA0702 Read and interpret the standard repair specifications and quality requirements from the manufacturer	AK0702 Safety practices and procedures	
		PA0703 Identify components, parts, seals, lubricants and specifications of these that must be available for repair	AK0703 Hydraulic system disassembly and assembly procedures	
		PA0704 Plan the sequence of work to repair the hydraulic system	AK0704 Hydraulic system component replacement procedures	
		PA0705 Identify potential hazards and risks related to the job and list the appropriate responses	AK0705 Lubricants, seals and part specifications and parts' numbers	
		PA0706 Identify, select and use the required hand tools, power tools and equipment	AK0706 Use and care for tools and equipment	
		PA0707 Disassemble the hydraulic system following the specified procedure	AK0707 Post repair activities	
		PA0708 Inspect components and parts and confirm required repairs		
		PA0709 Replace components or parts following the specified procedure		
		PA0711 Check and fill hydraulic fluids if required		
		PA0712 Check and confirm that repairs have resolved the problem or fault		

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0713 Conduct post-repair activities		
	PM-06-PS 08: Repair a pneumatic system	PA0801 Read and interpret the practical assignments on specific repairs required	AK0801 Procedures for repairing a pneumatic system	M2
		PA0802 Read and interpret the standard repair specifications and quality requirements from the manufacturer	AK0802 Safety practices and procedures	
		PA0803 Identify components, parts, seals, lubricants and specifications of these that must be available for repair	AK0803 Pneumatic system disassembly and assembly procedures	
		PA0804 Plan the sequence of work to repair the pneumatic system	AK0804 Pneumatic system component replacement procedures	
		PA0805 Identify potential hazards and risks related to the job and list the appropriate responses	AK0805 Lubricants, seals and part specifications and parts' numbers	
		PA0806 Identify, select and use the required hand tools, power tools and equipment	AK0806 Use and care for tools and equipment	
		PA0807 Disassemble the pneumatic system following the specified procedure	AK0807 Post repair activities	
		PA0808 Inspect components and parts and confirm required repairs		
		PA0809 Replace components or parts following the specified procedure		
		PA0810 Reassemble the pneumatic system following the specified procedure??		
		PA0811 Check and confirm that repairs have resolved the problem or fault		
		PA0812 Conduct post-repair activities		

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
652302000-PS-07: Install and commission mechanical sub-assemblies and machines, NQF Level 4 (12)	PM-07-PS01 Install and commission gearboxes	PA0101 Read and interpret the installation and commissioning specifications and quality requirements	AK0101 Gearbox installation and commissioning procedures and specifications	H3
		PA0102 Identify and select specific tools, equipment and materials required for the installation and commissioning process	AK0102 Use of and care for tools and equipment	
		PA0103 Plan the sequences for installation and commissioning		
		PA0104 Identify potential hazards and risks related to the job and list the appropriate responses		
		PA0105 Prepare the work area for installation of the gearbox		
		PA0106 Install gearbox to specifications		
		PA0107 Use tools and equipment correctly		
		PA0108 Follow the correct installation procedures and sequence		
		PA0109 Check gearbox installation by performing a systematic inspection of all the critical control points		
		PA0110 Commission the gearbox by performing a final inspection and performance test		
		PA0111 Perform post installation and commissioning activities		
	PM-07-PS02 Install and commission pumps	PA0201 Read and interpret the installation and commissioning specifications and quality requirements	AK0201 Pump installation and commissioning	I3

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
			procedures and specifications	
		PA0202 Identify and select specific tools, equipment and materials required for the installation and commissioning process	AK0202 Use and care of tools and equipment	
		PA0203 Plan the sequences for installation and commissioning		
		PA0204 Identify potential hazards and risks related to the job and list the appropriate responses		
		PA0205 Prepare the work area for installation of the pump		
		PA0206 Install the pump to specifications		
		PA0207 Use tools and equipment correctly		
		PA0208 Follow the correct installation procedures and sequence		
		PA0209 Check the pump installation by performing a systematic inspection of all the critical control points		
		PA0210 Commission the pump by performing a final inspection and performance test		
		PA0211 Perform post installation and commissioning activities		
	PM-07-PS03 Install and commission brakes	PA0301 Read and interpret the installation and commissioning specifications and quality requirements	AK0301 Brake installation and commissioning procedures and specifications	J2
		PA0302 Identify and select specific tools, equipment and materials required for the installation and commissioning process	AK0302 Use of and care for tools and equipment	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0303 Plan the sequences for installation and commissioning		
		PA0304 Identify potential hazards and risks related to the job and list the appropriate responses		
		PA0305 Prepare the work area for installation of the brake		
		PA0306 Install brake to specifications		
		PA0307 Use tools and equipment correctly		
		PA0308 Follow the correct installation procedures and sequence		
		PA0309 Check the brake installation by executing a systematic inspection of all the critical control points		
	PM-07-PS04 Install and commission clutches	PA0401 Read and interpret the installation and commissioning specifications and quality requirements	AK0401 Clutch installation and commissioning procedures and specifications	J2
		PA0402 Identify and select specific tools, equipment and materials required for the installation and commissioning process	AK0402 Use of and care for tools and equipment	
		PA0403 Plan the sequences for installation and commissioning		
		PA0404 Identify potential hazards and risks related to the job and list the appropriate responses		
		PA0405 Prepare the work area for installation of the clutch		
		PA0406 Install the clutch to specifications		

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0407 Use tools and equipment correctly		
		PA0408 Follow the correct installation procedures and sequence		
		PA0409 Check clutch installation by performing a systematic inspection of all the critical control points		
		PA0410 Commission the clutch by performing a final inspection and performance test		
		PA0411 Perform post installation and commissioning activities		
	PM-07-PS05 Install and commission drives	PA0501 Read and interpret the installation and commissioning specifications and quality requirements	AK0501 Drive installation and commissioning procedures and specifications	H4
		PA0502 Identify and select specific tools, equipment and materials required for the installation and commissioning process	AK0502 Use of and care for tools and equipment	
		PA0503 Plan the sequences for installation and commissioning		
		PA0504 Identify potential hazards and risks related to the job and list the appropriate responses		
		PA0505 Prepare the work area for installation of the drive		
		PA0506 Install the drive to specifications		
		PA0507 Use tools and equipment correctly		
		PA0508 Follow the correct installation procedures and sequence		

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0509 Check drive installation by performing a systematic inspection of all the critical control points		
		PA0510 Commission the drive by performing a final inspection and performance test		
	PM-07-PS06 Install lubrication components and commission lubrication systems	PA0601 Read and interpret the installation and commissioning specifications and quality requirements	AK0601 Lubrication system installation procedures and specifications	K3
		PA0602 Identify and select specific tools, equipment and materials required for the installation and commissioning process	AK0602 Operation of lubrication system	
		PA0603 Plan the sequences for installation and commissioning	AK0603 Commissioning of lubrication system	
		PA0604 Identify potential hazards and risks related to the job and list the appropriate responses	AK0604 Use of and care for tools and equipment	
		PA0605 Prepare the work area for installation of the lubrication system		
		PA0606 Install the lubrication system to specifications		
		PA0607 Use tools and equipment correctly		
		PA0608 Follow the correct installation procedures and sequence		
		PA0609 Check the lubrication system installation by performing a systematic inspection of all the critical control points		
		PA0610 Commission the lubrication system by performing a final inspection and performance test		

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA070611 Perform post installation and commissioning activities		
	PM-07-PS07 Install hydraulic components and commission hydraulic systems	PA0701 Read and interpret the installation and commissioning specifications and quality requirements	AK0701 Installation of hydraulic system components	L3
		PA0702 Identify and select specific tools, equipment and materials required for the installation and commissioning process	AK0702 Operation of hydraulic system	
		PA0703 Plan the sequences for installation and commissioning	AK0703 Commissioning of hydraulic system	
		PA0704 Identify potential hazards and risks related to the job and list the appropriate responses	AK0704 Use of and care for tools and equipment	
		PA0705 Prepare the work area for installation of the hydraulic system		
		PA0706 Install the lubrication system to specifications		
		PA0707 Use tools and equipment correctly		
		PA0708 Follow the correct installation procedures and sequence		
		PA0709 Check the hydraulic system installation by performing a systematic inspection of all the critical control points		
		PA0710 Commission the hydraulic system by performing a final inspection and performance test		
		PA0711 Perform post installation and commissioning activities		

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
	PM-07-PS08 Install pneumatic components and commission pneumatic systems	PA0801 Read and interpret the installation and commissioning specifications and quality requirements	AK0802 Operation of pneumatic system	M3
		PA0802 Identify and select specific tools, equipment and materials required for the installation and commissioning process	AK0803 Commissioning of pneumatic system	
		PA0803 Plan the sequences for installation and commissioning	AK0804 Use of and care for tools and equipment	
		PA0804 Identify potential hazards and risks related to the job and list the appropriate responses	AK0802 Operation of pneumatic system	
		PA0805 Prepare the work area for installation of the pneumatic system		
		PA0806 Install the pneumatic system to specifications		
		PA0807 Use tools and equipment correctly		
		PA0808 Follow the correct installation procedures and sequence		
		PA0809 Check the pneumatic system installation by performing a systematic inspection of all the critical control points		
		PA0810 Commission the pneumatic system by performing a final inspection and performance test		
		PA0811 Perform post installation and commissioning activities		
652302000-PS-08: Overhaul mechanical sub-	PM-08-PS01 Overhaul a gearbox	PA080101 Identify and select specific tools, equipment and materials required for the overhaul process	AK080101 Manufacture specifications	H1

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
assemblies and machines, NQF Level 4 (20)		PA080102 Identify potential hazards and risks related to the job and list the appropriate responses	AK080102 Overhauling procedures	
		PA080103 Disassemble the gearbox and prepare the components for inspection		
		PA080104 Inspect the components and draw up a material and replacement parts list		
		PA080105 Replace all worn parts to specification		
		PA080106 Assemble and restore the gearbox to conform to with the service tolerances specified in the manufacturer specifications		
		PA080107 Perform post overhauling activities		
	PM-08-PS02 Overhaul a pump	PA080201 Identify and select specific tools, equipment and materials required for the overhaul process	AK080201 Manufacture specifications	I1
		PA080202 Identify potential hazards and risks related to the job and list the appropriate responses	AK080202 Overhauling procedures	
		PA080203 Disassemble the pump and prepare the components for inspection		
		PA080204 Inspect the components and draw up a material and replacement parts list		
		PA080205 Replace all worn parts to specification		
		PA080206 Assemble and restore the pump to conform to the service tolerances specified in the manufacturer specifications		
		PA080207 Perform post overhauling activities		

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
	PM-08-PS03 Overhaul a mechanical machine that incorporates a hydraulic and pneumatic system	PA080301 Identify and select specific tools, equipment and materials required for the overhaul process	AK080301 Manufacture specifications	L2, M2
		PA080302 Identify potential hazards and risks related to the job and list the appropriate responses	AK080302 Overhauling procedures	
		PA080303 Disassemble the machine and prepare the components for inspection		
		PA080304 Inspect the components and draw up a material and replacement parts list		
		PA080305 Replace all worn parts to specification		
		PA080306 Assemble and restore the machine to conform to the service tolerances specified in the manufacturer specifications		
		PA080307 Perform post overhauling activities		
652302000-PS-9: Produce simple components by setting up and attending to the operation an engineering machine, NQF Level 2 (6)	PM-09-PS01 Set up and operate a centre lathe to debur, centre drill, champher and counter bore a work piece	PA0101 Read and interpret the engineering drawing and determine step-by-step machining operation and quality specifications	AK0102 Procedures, operating principles and specifications	P1
		PA0102 Identify and select material, cutting tools	AK0103 Types and applications of cutting tools and accessories	O1, O2, P1
		PA0103 Perform pre-operation inspections on the machining equipment for safety and functionality and respond accordingly		
		PA0105 Identify potential hazards and risks related to the job and list the appropriate responses	AK0101 Safety practices and procedures	O1, O2, P1
		PA0104 Grind cutting tools (high speed steel or tungsten carbide)	AK0104 Procedures to sharpen cutting tools	O1, O2, P1

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0105 Set-up the work piece and the machine		O2, P1
		PA0106 Fit and secure cutting tools		O2, P1
		PA0107 Calculate, select and set speeds and feeds	AK0105 Calculating speeds and feeds	O2, P1
		PA0108 Start up and lock out the lathe		O2, P1
		PA0109 Perform turning operations (debur, centre drill, champhering, counter boring)		P1
		PA0110 Monitor the lathe while in operation, making adjustments to speeds and feeds where required		P1
		PA0111 Remove the work piece and clean the lathe		O2, P1
		PA0112 Inspect the machined work piece for quality		P1
	PM-09-PS02 Set up and operate a conventional milling machine to debur, centre drill, champher and counter bore a work piece	PA0201 Read and interpret the engineering drawing and determine step-by-step machining operation and quality specifications	AK0302 Procedures, operating principles and specifications	Q1, Q3, Q4, R1
		PA0202 Identify and select material, cutting tools		Q1, Q3, Q4, R1
		PA0203 Perform pre-operation inspections on the machining equipment for safety and functionality and respond accordingly		Q1, Q3, Q4, R1
		PA0205 Identify potential hazards and risks related to the job and list the appropriate responses	AK0301 Safety practices and procedures	Q1, Q3, Q4, R1
		PA0204 Grind cutting tools (high speed steel or tungsten carbide)		Q1, R1
		PA0205 Set-up the work piece and the machine		Q3, Q4, R1

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0206 Fit and secure cutting tools		Q1, Q3, Q4, R1
		PA0207 Calculate, select and set speeds and feeds	AK0303 Calculating speeds and feeds	Q1, Q4, R1
		PA0208 Start up and lock out a conventional milling machine		R1
		PA0209 Perform milling machine operations (debur, centre drill, champhering, counter boring)		R1
		PA0210 Monitor the conventional milling machine while in operation, making adjustments to speeds and feeds where required		R1
		PA0211 Remove the work piece and clean the milling machine		R1
		PA0212 Inspect the machined work piece for quality		R1
	PM-09-PS03 Perform drilling on a centre lathe	PA0301 Read and interpret the engineering drawing and determine step-by-step drilling operation and quality specifications	AK0302 Procedures, operating principles and specifications	P1
		PA0302 Identify and select material, accessories, tools and in accordance with drawing or assignment specification		O2, P1
		PA0303 Perform pre-operation inspections on machining equipment for safety and functionality and respond accordingly		P1
		PA0304 Identify potential hazards and risks related to the job and list the appropriate responses	AK0301 Safety practices and procedures	P1

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0305 Set-up the work piece and the machine		P1
		PA0306 Calculate, select and set speeds and feeds	AK0303 Calculating speeds and feeds	O2, P1
		PA0307 Perform drilling operations		P1
		PA0308 Remove the work piece and clean the centre lathe		P1
		PA0309 Apply quality checks on machined component		P1
	PM-09-PS04 Perform tapping and reaming on a centre lathe	PA0401 Read and interpret the engineering drawing and determine step-by-step drilling operation and quality specifications	AK0402 Procedures, operating principles and specifications	P1
		PA0402 Identify and select material, accessories, tools and in accordance with drawing or assignment specification		O2, P1
		PA0403 Perform pre-operation inspections on machining equipment for safety and functionality and respond accordingly		P1
		PA0404 Identify potential hazards and risks related to the job and list the appropriate responses	AK0401 Safety practices and procedures	P1
		PA0405 Set-up the work piece and the machine		P1
		PA0406 Calculate, select and set speeds and feeds	AK0403 Calculating speeds and feeds	O2, P1
		PA0407 Perform tapping and reaming operations		P1
		PA0408 Remove the work piece and clean the centre lathe		P1

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0409 Apply quality checks on machined component		P1
	PM-09-PS05 Perform parting on a centre lathe	PA0501 Read and interpret the engineering drawing and determine step-by-step drilling operation and quality specifications	AK0502 Procedures, operating principles and specifications	P2
		PA0502 Identify and select material, accessories, tools and in accordance with drawing or assignment specification		O2, P2
		PA0503 Perform pre-operation inspections on machining equipment for safety and functionality and respond accordingly		P2
		PA0504 Identify potential hazards and risks related to the job and list the appropriate responses	AK0501 Safety practices and procedures	P2
		PA0505 Set-up the work piece and the machine		P2
		PA0506 Calculate, select and set speeds and feeds	AK0503 Calculating speeds and feeds	O2, P2
		PA0507 Perform parting operations		P2
		PA0508 Remove the work piece and clean the centre lathe		P2
		PA0509 Apply quality checks on machined component		P2
		PM-09-PS06 Perform grooving and knurling on a centre lathe	PA0601 Read and interpret the engineering drawing and determine step-by-step drilling operation and quality specifications	AK0602 Procedures, operating principles and specifications
	PA0602 Identify and select material, accessories, tools and in accordance with drawing or assignment specification			O2, P2

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0603 Perform pre-operation inspections on machining equipment for safety and functionality and respond accordingly		P2
		PA0604 Identify potential hazards and risks related to the job and list the appropriate responses	AK0601 Safety practices and procedures	P2
		PA0605 Set-up the work piece and the machine		P2
		PA0606 Calculate, select and set speeds and feeds	AK0603 Calculating speeds and feeds	O2, P2
		PA0607 Perform grooving and knurling operations		P2
		PA0608 Remove the work piece and clean the centre lathe		P2
		PA0609 Apply quality checks on machined component		P2
	PM-09-PS07 Produce parallel and tapered work pieces on a centre lathe	PA0701 Read and interpret the engineering drawing and determine step-by-step drilling operation and quality specifications	AK0702 Procedures, operating principles and specifications	P2, P3
		PA0702 Identify and select material, accessories, tools and in accordance with drawing or assignment specification		
		PA0703 Perform pre-operation inspections on machining equipment for safety and functionality and respond accordingly		
		PA0704 Identify potential hazards and risks related to the job and list the appropriate responses	AK0701 Safety practices and procedures	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0705 Set-up the work piece and the machine		
		PA0706 Calculate, select and set speeds and feeds	AK0703 Calculating speeds and feeds	
		PA0707 Produce parallel and tapered work pieces		
		PA0708 Remove the work piece and clean the centre lathe		
		PA0709 Apply quality checks on machined component		
	PM-09-PS08 Turn an internal radius on a centre lathe	PA0801 Read and interpret the engineering drawing and determine step-by-step drilling operation and quality specifications	AK0803 Procedures, operating principles and specifications	P5
		PA0802 Identify and select material, accessories, tools and in accordance with drawing or assignment specification		O2, P5
		PA0803 Perform pre-operation inspections on machining equipment for safety and functionality and respond accordingly		P5
		PA0804 Identify potential hazards and risks related to the job and list the appropriate responses	AK0801 Safety practices and procedures	P5
		PA0805 Set-up the work piece and the machine		P5
		PA0806 Calculate, select and set speeds and feeds	AK0803 Calculating speeds and feeds	O2, P5
		PA0807 Turn the internal radius		P5
		PA0808 Remove the work piece and clean the centre lathe		P5

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0809 Apply quality checks on machined component		P5
	PM-09-PS09 Produce external keyways on a conventional milling machine	PA0901 Read and interpret the engineering drawing and determine step-by-step drilling operation and quality specifications	AK0903 Procedures, operating principles and specifications	R2
		PA0902 Identify and select material, accessories, tools and in accordance with drawing or assignment specification		
		PA0903 Perform pre-operation inspections on machining equipment for safety and functionality and respond accordingly		
		PA0904 Identify potential hazards and risks related to the job and list the appropriate responses	AK0901 Safety practices and procedures	
		PA0905 Set-up the work piece and the machine		
		PA0906 Calculate, select and set speeds and feeds	AK0903 Calculating speeds and feeds	
		PA0907 Mill external keyways		
		PA0908 Remove the work piece and clean the milling machine		
		PA0909 Apply quality checks on machined component		
652302000-PS-10: Produce components of intermediate complexity by performing		PM-10-PS01 Machine external and internal tapers on a centre lathe	PA0101 Read and interpret the engineering drawings, and plan and prepare for the turning task	
	PA0102 Determine step-by-step operation and the turning sequence of external and internal tapers		AK0103 Procedures, operating principles and specifications of	P3

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
engineering machining operations, NQF Level 3 (12)			machining equipment and accessories	
		PA0103 Identify and select material, cutting tools and measuring equipment requirements	AK0102 Identification, reading, calibration, use and care of measuring equipment/instruments	
		PA0104 Calculate and set speeds and feeds for the task	AK0105 Speeds and feeds	
		PA0105 Perform pre-operation inspections on machining equipment and report		
		PA0106 Identify potential hazards and risks related to the job and list the appropriate responses	AK0104 Safety practices and procedures	
		PA0107 Set-up, align and secure the work piece	AK0106 Methods of setting-up work piece	
		PA0108 Set-up cutting tools, coolant and accessories	AK0111 Identification, function, use and care of cutting tools and equipment	
		PA0109 Sequence the specific turning operation for external and internal tapers	AK0107 The sequence of machining external and internal tapers	
		PA0110 Machine external and internal tapers on a centre lathe	AK0108 Calculations of tapers	
		PA0111 Monitor the lathe while in operation, making adjustments to speeds and feeds where required	AK0109 Gear selection and settings for a specific cutting operation	
		PA0112 Apply quality checks on the machined work piece	AK0110 Tolerances and fits	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0113 Remove, clean and return tools, measuring instruments and accessories		
		PA0114 Perform post machining equipment checks and maintenance		
	PM-10-PS02 Machine external threads on a centre lathe	PA0201 Read and interpret the engineering drawings, and plan and prepare for the turning task	AK0201 Engineering drawings	P5
		PA0202 Determine step-by-step operation and the turning sequence of external threads	AK0202 Identification, reading, calibration, use and care of measuring equipment/instruments	P5
		PA0203 Identify and select material, cutting tools and measuring equipment requirements	AK0203 Procedures, operating principles and specifications of machining equipment and accessories	O2, P5
		PA0204 Calculate and set speeds and feeds for the task	AK0204 Safety practices and procedures	O2, P5
		PA0205 Perform pre-operation inspections on machining equipment and report	AK0205 Speeds and feeds	P5
		PA0206 Identify potential hazards and risks related to the job and list the appropriate responses	AK0206 Methods of setting-up work piece	P5
		PA0207 Set-up, align and secure the work piece	AK0207 The sequence of machining external and internal tapers	P5
		PA0208 Set-up cutting tools, coolant and accessories	AK0208 Calculations of tapers	P5

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0209 Sequence the specific turning operation for external threads	AK0209 Gear selection and settings for a specific cutting operation	P5
		PA0210 Machine external threads on a centre lathe	AK0210 Tolerances and fits	P5
		PA0211 Monitor the lathe while in operation, making adjustments to speeds and feeds where required	AK0211 Identification, function, use and care of cutting tools and equipment	P5
		PA0212 Apply quality checks on the machined work piece	AK0212 Lock out procedures for a centre lathe	P5
		PA0213 Remove, clean and return tools, measuring instruments and accessories		P5
		PA0214 Perform post machining equipment checks and maintenance		P5
	PM-10-PS03 Machine bushes on a centre lathe	PA0301 Read and interpret the engineering drawings, and plan and prepare for the turning task	AK0301 Engineering drawings	P3
		PA0302 Determine step-by-step operation and the turning sequence	AK0302 Identification, reading, calibration, use and care of measuring equipment/instruments	
		PA0303 Identify and select material, cutting tools and measuring equipment requirements	AK0303 Procedures, operating principles and specifications of machining equipment and accessories	
		PA0304 Calculate and set speeds and feeds for the task	AK0304 Safety practices and procedures	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0305 Perform pre-operation inspections on machining equipment for safety and functionality and respond accordingly	AK0305 Speeds and feeds	
		PA0306 Identify potential hazards and risks related to the job and list the appropriate responses	AK0306 Methods of setting-up work piece	
		PA0307 Set-up, align and secure the work piece	AK0307 The sequence of cutting bushes	
		PA0308 Set-up cutting tools, coolant and accessories	AK0308 Gear selection and settings for a specific cutting operation	
		PA0309 Sequence the specific turning operation for bushes	AK0309 Tolerances and fits	
		PA0310 Machine bushes on a centre lathe	AK0310 Identification, function, use and care of cutting tools and equipment	
		PA0311 Monitor the lathe while in operation, making adjustments to speeds and feeds where required	AK0311 Lock out procedures for a centre lathe machine	
		PA0312 Apply quality checks on the machined component to ensure that the finished component meets specified requirements		
		PA0313 Remove, clean and return tools, measuring instruments and accessories		
		PA0314 Perform post machining equipment checks and maintenance		
	PM-10-PS04 Perform turning between	PA0401 Read and interpret the engineering drawings, and plan and prepare for the turning task	AK0401 Engineering drawings	P4

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
	centres on a centre lathe	PA0402 Determine step-by-step operation and the turning sequence	AK0402 Identification, reading, calibration, use and care of measuring equipment/instruments	
		PA0403 Identify and select material, cutting tools and measuring equipment requirements	AK0403 Procedures, operating principles and specifications of machining equipment and accessories	
		PA0404 Calculate and set speeds and feeds for the task	AK0404 Safety practices and procedures	
		PA0405 Perform pre-operation inspections on machining equipment for safety and functionality and respond accordingly	AK0405 Speeds and feeds	
		PA0406 Identify potential hazards and risks related to the job and list the appropriate responses	AK0406 Methods of setting-up work piece	
		PA0407 Set-up, align and secure the work piece	AK0407 The sequence of turning between centres	
		PA0408 Set-up cutting tools, coolant and accessories	AK0408 Gear selection and settings for a specific cutting operation	
		PA0409 Sequence the specific turning operation	AK0409 Tolerances and fits	
		PA0410 Machine a work piece between centres on a centre lathe	AK0410 Identification, function, use and care of cutting tools and equipment	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0411 Monitor the lathe while in operation, making adjustments to speeds and feeds where required	AK0411 Lock out procedures for a centre lathe machine	
		PA0412 Apply quality checks on the machined component to ensure that the finished component meets specified requirements		
		PA0413 Remove, clean and return tools, measuring instruments and accessories		
		PA0414 Perform post machining equipment checks and maintenance		
	PM-10-PS05 Perform turning using fixed and running steadies	PA0501 Read and interpret the engineering drawings, and plan and prepare for the turning task	AK0501 Engineering drawings	O3
		PA0502 Determine step-by-step operation and the turning sequence	AK0502 Identification, reading, calibration, use and care of measuring equipment/instruments	
		PA0503 Identify and select material, cutting tools and measuring equipment requirements	AK0503 Procedures, operating principles and specifications of machining equipment and accessories	
		PA0504 Calculate and set speeds and feeds for the task	AK0504 Safety practices and procedures	
		PA0505 Perform pre-operation inspections on machining equipment for safety and functionality and respond accordingly	AK0505 Speeds and feeds	
		PA0506 Identify potential hazards and risks related to the job and list the appropriate responses	AK0506 Methods of setting-up work piece	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0507 Set-up, align and secure the work piece	AK0507 The sequence of turning using fixed and running steadies	
		PA0508 Set-up cutting tools, coolant and accessories	AK0508 Gear selection and settings for a specific cutting operation	
		PA0509 Sequence the specific turning operation	AK0509 Tolerances and fits	
		PA0510 Use fixed and running steadies to machine a work piece	AK0510 Identification, function, use and care of cutting tools and equipment	
		PA0511 Monitor the lathe while in operation, making adjustments to speeds and feeds where required	AK0511 Lock out procedures for a centre lathe machine	
		PA0512 Apply quality checks on the machined component to ensure that the finished component meets specified requirements		
		PA0513 Remove, clean and return tools, measuring instruments and accessories		
		PA0514 Perform post machining equipment checks and maintenance		
	PM-10-PS06 Machine a square on a conventional milling machine	PA0601 Read and interpret the engineering drawings, and plan and prepare for the milling task	AK0601 Engineering drawings	R3
		PA0602 Determine step-by-step operation and the milling sequence	AK0603 Identification, reading, calibration, use and care of measuring equipment/instruments	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0603 Identify and select material, cutting tools and measuring equipment requirements	AK0604 Procedures, operating principles and specifications of machining equipment and accessories	
		PA0604 Calculate and set speeds and feeds for the task	AK0605 Safety practices and procedures	
		PA0605 Perform pre-operation inspections on machining equipment for safety and functionality and respond accordingly	AK0606 Speeds and feeds	
		PA0606 Identify potential hazards and risks related to the job and list the appropriate responses	AK0607 Methods of setting-up work piece	
		PA0607 Set-up, align and secure the work piece	AK0608 The sequence of milling a square	
		PA0608 Set-up cutting tools, coolant and accessories	AK0609 Gear selection and settings for a specific cutting operation	
		PA0609 Sequence the specific milling operation	AK0610 Tolerances and fits	
		PA0610 Machine the work piece to a square	AK0611 Identification, function, use and care of cutting tools and equipment	
		PA0611 Monitor the milling machine while in operation, making adjustments to speeds and feeds where required	AK0612 Lock out procedures for a conventional milling machine	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0612 Apply quality checks on the machined component to ensure that the finished component meets specified requirements		
		PA0613 Remove, clean and return tools, measuring instruments and accessories		
		PA0614 Perform post machining equipment checks and maintenance		
652302000-PS-11: Perform complex machining operations, NQF Level 4 (24)	PM-11-PS01 Machine internal threads on a centre lathe	PA0101 Read and interpret assembly drawings to plan and sequence the turning operation materials, accessories and equipment required for the turning operation	AK0101 Engineering drawings	P5
		PA0102 Perform pre-operation inspections on machining equipment	AK0102 Identification, function, use and care of cutting tools and equipment	P5
		PA0103 Calculate and set speeds and feeds for the machining operation.	AK0103 Identification, reading, calibration, use and care of measuring equipment/instruments	O2, P5
		PA0104 Identify potential hazards and risks related to the job and list the appropriate responses	AK0104 Safety practices and procedures	P5
		PA0105 Set-up cutting tools, coolant and accessories	AK0105 Speeds and feeds	O2, P5
		PA0106 Select the method for machining of the thread in accordance with the specified drawing.	AK0106 Procedures, operating principles and specifications of machining equipment and accessories	P5

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0107 Sequence machining according to the requirements of the specific turning operation	AK0107 Types and applications of cutting tools	P5
		PA0108 Machine thread to match the pitch gage or test nut	AK0108 Tolerances and fits	P5
		PA0109 Monitor lathe while in operation, and make adjustments to speeds and feeds where required	AK0109 Methods of setting up work piece	P5
		PA0110 Use measuring equipment to ensure that threads are correct in accordance with specified tolerances	AK0110 Methods of machining threads	P5
		PA0111 Recognised and addressed problems in accordance with standard turning procedures		P5
	PM-11-PS02 Perform off centre machining on a centre lathe	PA0201 Read and interpret assembly drawings to plan and sequence the turning operation materials, accessories and equipment required for the turning operation	AK0201 Engineering drawings	P6
		PA0202 Perform pre-operation inspections on machining equipment	AK0202 Identification, function, use and care of cutting tools and equipment	
		PA0203 Calculate and set speeds and feeds for the machining operation.	AK0203 Identification, reading, calibration, use and care of measuring equipment/instruments	
		PA0204 Identify potential hazards and risks related to the job and list the appropriate responses	AK0204 Safety practices and procedures	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0205 Set-up and secured the work piece without damage to work piece or machine	AK0205 Speeds and feeds	
		PA0206 Select and set-up cutting tools, coolant and accessories	AK0206 Procedures, methods and specifications of off centre machining	
		PA0207 Sequence machining according to the requirement of the specific turning operation	AK0207 Types and applications of cutting tools	
		PA0208 Machine the work piece to drawing specifications	AK0208 Tolerances and fits	
		PA0209 Monitor lathe while in operation, and make adjustments to speeds and feeds where required	AK0209 Methods of setting up work piece	
		PA0210 Use measuring equipment to ensure that work piece is correct in accordance with specified tolerances		
		PA0211 Recognised and addressed problems in accordance with standard turning procedures		
	PM-11-PS03 Machine internal keyways on a conventional milling machine	PA0301 Interpret tables to determine the different types and class of fits.	AK0301 Engineering drawings	R5
		PA0302 Interpret tables and apply formulae to calculate reaming, tapping and screw cutting settings	AK0302 Identification, function, use and care of cutting tools and equipment	
		PA0303 Read and interpret assembly drawings to plan and sequence the turning operation	AK0303 Identification, reading, calibration, use and care of measuring equipment/instruments	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0304 Read and interpret assembly drawings to plan the materials, accessories and equipment required for the turning operation	AK0304 Safety practices and procedures	
		PA0305 Perform pre-operation inspection on machining equipment	AK0305 Calculation of speeds and feeds	
		PA0306 Analyse the impact of speeds and feeds to achieve the required standard and quality of finish.	AK0306 Procedures, operating principles and specifications of machining equipment and accessories	
		PA0307 Perform pre-operation inspections on machining equipment for safety and functionality and respond accordingly	AK0307 Types and applications of cutting tools	
		PA0308 Set-up and secured the work piece without damage to work piece or machine	AK0308 Tolerances and fits	
		PA0309 Select and install required accessories PA0311 Determine internal and external diameters by using tables or calculations	AK0309 Methods of setting up work piece	
		PA0310 Set-up and align work piece	AK0310 Methods of machine tapping and reaming	
		PA0311 Determine internal and external diameters by using tables or calculations		
		PA0312 Select speeds and feeds according to charts and calculations		
		P10313 Select gear train settings and set to machine multiple start threads according to the calculations		

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0314 Prepare cutting tools to machine multiple start threads according to the pitch and type of thread		
		PA0315 Machine and match multiple start threads according to the calculated diameters		
		PA0316 Use measuring equipment to test whether multiple start threads meet specified tolerance		
		PA0317 Sequence cutting according to the requirement of the specific turning operation		
		PA0318 Monitor lathe while in operation, making adjustments to speeds and feeds where required		
		PA0319 Finish the component in accordance with quality and drawing specifications		
		PA0320 Recognised and addressed problems in accordance with standard operating procedures		
	PM-11-PS04 Machine a hexagon on a conventional milling machine	PA0401 Read and interpret the engineering drawings, and plan and prepare for the milling task	AK0401 Engineering drawings	R4
		PA0402 Determine step-by-step operation and the milling sequence	AK0403 Identification, reading, calibration, use and care of measuring equipment/instruments	
		PA0403 Identify and select material, cutting tools and measuring equipment requirements	AK0404 Procedures, operating principles and specifications of machining equipment and accessories	

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
		PA0404 Calculate and set speeds and feeds for the task	AK0405 Safety practices and procedures	
		PA0405 Perform pre-operation inspections on machining equipment for safety and functionality and respond accordingly	AK0406 Speeds and feeds	
		PA0406 Identify potential hazards and risks related to the job and list the appropriate responses	AK0407 Methods of setting-up work piece	
		PA0407 Set-up, align and secure the work piece	AK0408 The sequence of milling a hexagon	
		PA0408 Set-up cutting tools, coolant and accessories	AK0409 Gear selection and settings for a specific cutting operation	
		PA0409 Sequence the specific milling operation	AK0410 Tolerances and fits	
		PA0410 Machine the work piece to a hexagon	AK0411 Identification, function, use and care of cutting tools and equipment	
		PA0411 Monitor the milling machine while in operation, making adjustments to speeds and feeds where required	AK0412 Lock out procedures for a conventional milling machine	
		PA0412 Apply quality checks on the machined component to ensure that the finished component meets specified requirements		
		PA0413 Remove, clean and return tools, measuring instruments and accessories		
		PA0414 Perform post machining equipment checks and maintenance		

Module	Topic	Guideline for topic	Applied Knowledge	NOCC A21 Learning Area and Work Situation
	PM-11-PS05 Setup, calculate and test a dividing head on a conventional milling machine	PA0501 Calculate index crank movement	AK0501 Identification, function, use and care of the dividing head and accessories	
		PA0502 Calculate indexing for different plates	AK0502 Calculations	
		PA0503 Select and fit the index plate	AK0503 Procedures, operating principles and specifications of dividing heads and accessories	
		PA0504 Set the crank arm and selector plate to the correct index pin position	AK0504 Methods of setting-up a dividing head and accessories	
		PA0505 Centre the dividing head		
		PA0506 Test the dividing head for accuracy		
	PM-11-PS06 Setup calculate and test a turntable on a conventional milling machine	PA0601 Calculate index crank movement	AK0601 Identification, function, use and care of the rotary table and accessories	Q4
		PA0602 Calculate indexing for different plates	AK0602 Calculations	
		PA0603 Set the crank arm and selector plate to the correct index pin position	AK0603 Procedures, operating principles and specifications of rotary tables and accessories	
		PA0604 Centre the rotary table	AK0604 Methods of setting-up a rotary table	
		PA0605 Test the rotary table for accuracy		

Work Modules

Module	Topic	Guideline for topic	Contextualised Workplace Knowledge	NOCC A21 Learning Area and Work Situation
652302000-WM-01: Fabrication processes in an engineering workshop, NQF Level 2 (20)	WM-01-WE01 Fabricate a variety of simple components using basic hand skills and tools	WA0101 Mark-off and fabricate a minimum of two flanges to given specifications	1 Workplace Hazard Inspection and Risk Assessment procedures	E1
		WA0102 Mark-off, cut and fit a minimum of two gaskets to specifications using different materials	2 Material request and storage procedures	
		WA0103 Mark-off, cut and fit a minimum of two spacers/shims to specifications	3 Equipment handling and storage procedures	
		WA0104 Saw and file a minimum of two work pieces to specifications	4 Conditions of employment	
		WA0105 Mark-off and fabricate a minimum of two keys to specification		
		WA0106 Tap and ream a minimum of two different sized holes to specifications		
	WM-01-WE02 Fabricate a range of mechanical components in an engineering workshop using power tools and equipment	WA0201 Drill holes in a minimum of two work pieces as per specifications using portable and fixed drilling machines	1 Workplace Hazard Inspection and Risk Assessment procedures	E2
		WA0202 Sharpen a minimum of two drill bits using fixed grinding machines	2 Material request and storage procedures	E2
		WA0203 Sharpen a minimum of two chisels using fixed grinding machines	3 Equipment handling and storage procedures	E2
		WA0204 Sharpen a range of cutting tools using fixed grinding machines	4 Conditions of employment	E2
		WA0205 Replace and dress a grinding wheel		E2
		WA0206 Saw a minimum of two work pieces to specification		E3, E4

Module	Topic	Guideline for topic	Contextualised Workplace Knowledge	NOCC A21 Learning Area and Work Situation
		WA0207 Cut and grind a minimum of two work pieces to specification		E3, E4
		WA0208 Gas cut and weld a minimum of two work pieces to specification using gas cutting and welding equipment		G1
		WA0209 Arc weld a minimum of two work pieces to specification using an arc welding machine		G2
	WM-01-WE03 Work as a member of a team	WA0301 Provide support to co-employees when required or requested	1 Workplace Hazard Inspection and Risk Assessment procedures	A2, B5
		WA0302 Comply with work place rules and, or codes of conduct	2 Material request and storage procedures	
		WA0303 Complete work within accepted turnaround times	3 Equipment handling and storage procedures	
		WA0304 Complete work to accepted standards of quality	4 Conditions of employment	
652302000-WM-02: Routine mechanical component and machine maintenance processes, NQF Level 3 (40)	WM-02-WE01 For a period of two weeks, assist an experienced artisan performing routine maintenance on mechanical sub-assemblies and machines	WA0101 Observe inspection processes, safety procedures, lock out, tagging and site preparation procedures during routine maintenance	1 Workplace Hazard Inspection and Risk Assessment procedures	H1-H2, I1-I2, J1, K1-K2, L2, M2
		WA0102 Observe interaction with production personnel and reporting	2 Material request and storage procedures	
		WA0103 Observe and assist with a range of routine maintenance tasks of varying complexity	3 Equipment handling and storage procedures	
		WA0104 The experience must include routine maintenance on at least any 5 of the following: gearboxes, pumps, brakes, clutches, drives,	4 Standard operating procedures	

Module	Topic	Guideline for topic	Contextualised Workplace Knowledge	NOCC A21 Learning Area and Work Situation
		valves, bearings, lubrication system, hydraulic systems, pneumatic systems		
			5 Original Equipment Manufacturer manuals and specifications	
	WM-02-WE02 Perform routine maintenance of a range mechanical machines and sub-assemblies under supervision	WA0201 Conduct inspection processes safety procedures, lock out, tagging and site preparation procedures during routine maintenance under supervision	1 Workplace Hazard Inspection and Risk Assessment procedures	H1-H2, I1-I2, J1, K1-K2, L2, M2
		WA0202 Interact with production personnel and report routine maintenance under supervision	2 Material request and storage procedures	
		WA0203 Conduct a range of routine maintenance tasks of varying complexity under supervision	3 Equipment handling and storage procedures	
		WA0204 The experience must include routine maintenance on at least any 5 of the following: gearboxes, pumps, brakes, clutches, drives, valves, bearings, lubrication system, hydraulic systems, pneumatic systems	4 Standard operating procedures	
			5 Original Equipment Manufacturer manuals and specifications	
	WM-02-WE03 Perform routine maintenance of mechanical machines and sub- assemblies autonomously	WA0301 Conduct inspection processes safety procedures, lock out, tagging and site preparation procedures during routine maintenance	1 Workplace Hazard Inspection and Risk Assessment procedures	H1-H2, I1-I2, J1, K1-K2, L2, M2
		WA0302 Interact with production personnel and report routine maintenance	2 Material request and storage procedures	
		WA0303 Conduct a range of routine maintenance tasks of varying complexity	3 Equipment handling and storage procedures	

Module	Topic	Guideline for topic	Contextualised Workplace Knowledge	NOCC A21 Learning Area and Work Situation	
		WA0304 The experience must include routine maintenance on at least any 5 of the following: gearboxes, pumps, brakes, clutches, drives, valves, bearings, lubrication system, hydraulic systems, pneumatic systems	4 Standard operating procedures		
			5 Original Equipment Manufacturer manuals and specifications		
	WM-02-WE04 Perform routine maintenance of mechanical machines and sub- assemblies autonomously under work pressure conditions such as shifts	WA0401 Perform tasks within accepted standards of performance under work pressure	1 Workplace Hazard Inspection and Risk Assessment procedures	H1-H2, I1-I2, J1, K1-K2, L2, M2	
		WA0402 Perform a range of routine maintenance tasks under work pressure	2 Material request and storage procedures		
		WA0403 The experience must include a variety of pressure situations caused by factors such as limited availability of technical support during shifts, high work volumes, and peak production periods.	3 Equipment handling and storage procedures		
		WA0401 Perform tasks within accepted standards of performance under work pressure	4 Standard operating procedures		
			5 Original Equipment Manufacturer manuals and specifications		
	652302000-WM-03: Maintenance planning and communication processes, NQF Level 3 (10)	WM-03-WE01 Plan and execute maintenance work within accepted turnaround times and quality standards	WA0101 Diarise or schedule work activities in accordance with priorities and work targets	1 Material request and storage procedures	A4, B5
			WA0102 Complete work within accepted turnaround times and quality standards	2 Equipment handling and storage procedures	B5
			WA0103 Plan the execution of maintenance requests with production staff to minimise down time or production losses	3 Reporting channels and delegated responsibilities	A4, B5

Module	Topic	Guideline for topic	Contextualised Workplace Knowledge	NOCC A21 Learning Area and Work Situation
			4 Work records	
	WM-03-WE02: Communicate on and solve problems related to the execution of maintenance requests	WA0201 Take responsibility and initiative to solve work related problems within the scope of standard procedures	1 Material request and storage procedures	A2, A4
		WA0202 Recognise and report trends of re-occurring problems	2 Equipment handling and storage procedures	
		WA0203 Identify and initiate appropriate corrective actions when deviations and non-conformances are observed to minimise downtime or production losses	3 Reporting channels and delegated responsibilities	
			4 Work records	
	WM-03-WE03: Keep complete and accurate job cards or records	WA0301 Record job records in prescribed formats	1 Material request and storage procedures	A4
		WA0302 Keep material and stores records in prescribed formats	2 Equipment handling and storage procedures	B2
			3 Reporting channels and delegated responsibilities	
			4 Work records	
652302000-WM-04: Repair mechanical faults on mechanical sub-assemblies and machines, NQF level 4 (60)	WM-04-WE01 For a period of two weeks, assist an experienced artisan repairing faults on mechanical sub-assemblies and machines	WA0101 Observe inspection processes, safety procedures, lock out, tagging and site preparation procedures	1 Material request and storage procedures	H1-H2, I1-I2, J1, K1-K2, L2, M2
		WA0102 Observe interaction with production personnel and reporting	2 Equipment handling and storage procedures	
		WA0103 Observe and assist with a range of mechanical fault-finding, repairs, installation and commissioning tasks	3 Reporting channels and delegated responsibilities	
		WA0104 The experience must include a variety of breakdowns on at least any 5 of the following: gearboxes, pumps, brakes, clutches,	4 Work records	

Module	Topic	Guideline for topic	Contextualised Workplace Knowledge	NOCC A21 Learning Area and Work Situation
		drives, valves, bearings, lubrication system, hydraulic systems, pneumatic systems		
			5 Standard operating procedures	
			6 Original Equipment Manufacturer manuals and specifications	
	WM-04-WE02 Perform repairs on a range mechanical machines and sub-assemblies under supervision	WA0201 Perform inspection processes, safety procedures, lock out, tagging and site preparation procedures under supervision	1 Material request and storage procedures	H1-H2, I1-I2, J1, K1-K2, L2, M2
		WA0202 Interact with production personnel and report under supervision	2 Equipment handling and storage procedures	
		WA0203 Perform a range of mechanical fault-finding, repairs, installation and commissioning tasks under supervision	3 Reporting channels and delegated responsibilities	
		WA0204 The experience must include a variety of breakdowns on at least any 5 of the following: gearboxes, pumps, brakes, clutches, drives, valves, bearings, lubrication system, hydraulic systems, pneumatic systems	4 Work records	
			5 Standard operating procedures	
			6 Original Equipment Manufacturer manuals and specifications	
	WM-04-WE03 Perform repairs on mechanical machines and sub-assemblies autonomously	WA0301 Perform inspection processes safety procedures, lock out, tagging and site preparation procedures	1 Material request and storage procedures	H1-H2, I1-I2, J1, K1-K2, L2, M2
		WA0302 Interact with production personnel and report	2 Equipment handling and storage procedures	

Module	Topic	Guideline for topic	Contextualised Workplace Knowledge	NOCC A21 Learning Area and Work Situation
		WA0303 Perform a range of mechanical fault-finding, repairs, installation and commissioning tasks	3 Reporting channels and delegated responsibilities	
		WA0304 The experience must include a variety of breakdowns on at least any 5 of the following: gearboxes, pumps, brakes, clutches, drives, valves, bearings, lubrication system, hydraulic systems, pneumatic systems	4 Work records	
			5 Standard operating procedures	
			6 Original Equipment Manufacturer manuals and specifications	
	WM-04-WE04 Perform repairs on mechanical machines and sub-assemblies autonomously under work pressure conditions such as shifts	WA0401 Perform tasks within accepted standards of performance under work pressure	1 Material request and storage procedures	H1-H2, I1-I2, J1, K1-K2, L2, M2
		WA0402 Perform a range of mechanical fault-finding, repairs, installation and commissioning tasks under work pressure	2 Equipment handling and storage procedures	
		WA0403 The experience must include a variety of pressure situations caused by factors such as limited availability of technical support during shifts, high work volumes, peak production periods	3 Reporting channels and delegated responsibilities	
			4 Work records	
			5 Standard operating procedures	
			6 Original Equipment Manufacturer manuals and specifications	

Module	Topic	Guideline for topic	Contextualised Workplace Knowledge	NOCC A21 Learning Area and Work Situation	
65230200: WM05-05: Overhauling processes in an engineering workshop, NQF Level 4 (60)	WM-05-WE01 For a period of two weeks, assist an experienced artisan in overhauling mechanical sub-assemblies and machines	WA0101 Observe overhaul planning processes and pre-overhauling inspection procedures	1 Material request and storage procedures	H1, I1, L2, M2	
		WA0102 Observe and assist with a range of overhauling tasks	2 Equipment handling and storage procedures		
		WA0103 The experience must include a variety of overhauling projects on at least any 2 of the following: gearboxes, pumps, brakes, clutches, drives, valves, lubrication system, hydraulic systems, pneumatic systems	3 Reporting channels and delegated responsibilities		
			4 Work records		
		5 Standard operating procedures			
		6 Original Equipment Manufacturer manuals and specifications			
	WM-05-WE02 Overhaul of a range mechanical machines and sub-assemblies under supervision	WA0201 Perform overhaul planning processes and pre-overhauling inspection procedures under supervision	1 Material request and storage procedures		H1, I1, L2, M2
		WA0202 Perform a range of overhauling tasks under supervision	2 Equipment handling and storage procedures		
		WA0203 The experience must include a variety of overhauling projects on at least any 2 of the following: gearboxes, pumps, brakes, clutches, drives, valves, lubrication system, hydraulic systems, pneumatic systems	3 Reporting channels and delegated responsibilities		
			4 Work records		
		5 Standard operating procedures			

Module	Topic	Guideline for topic	Contextualised Workplace Knowledge	NOCC A21 Learning Area and Work Situation
			6 Original Equipment Manufacturer manuals and specifications	
	WM-05-WE03 Overhaul mechanical machines and sub-assemblies autonomously	WA0301 Perform overhaul planning processes and pre-overhauling inspection procedures	1 Material request and storage procedures	H1, I1, L2, M2
		WA0302 Perform a range of overhauling tasks	2 Equipment handling and storage procedures	
		WA0303 The experience must include a variety of overhauling projects on at least any 2 of the following: gearboxes, pumps, brakes, clutches, drives, valves, lubrication system, hydraulic systems, pneumatic systems	3 Reporting channels and delegated responsibilities	
			4 Work records	
			5 Standard operating procedures	
			6 Original Equipment Manufacturer manuals and specifications	
652302000-WM-06: Structured planning and communication processes in the workplace, NQF Level 4 (60)	WM-06-WE01 Work as a team member in different roles, including directing work teams or personal assistants	WA0101 Act as a team leader for at least two specific projects in the workplace	1 Reporting channels and delegated responsibilities	A2
		WA0102 Report on work progress and achievement within target dates for specific problems	2 Work records	
		WA0103 Demonstrate the ability to respond constructively to problems experienced in the workplace and to provide guidance when required	3 Standard operating procedures	
	WM-06-WE02 Participate in and	WA0201 Attend at least 4 planning meetings and contribute to planning of and reporting on work activities	1 Reporting channels and delegated responsibilities	A2, A4

Module	Topic	Guideline for topic	Contextualised Workplace Knowledge	NOCC A21 Learning Area and Work Situation
	contribute to workplace meetings	WA0202 Attend and contribute to at least one meeting where workplace costs are addressed	2 Work records	
			3 Standard operating procedures	
	WM-06-WE03 Contribute to maintaining a safe and productive workshop environment	WA0301 Perform a hazard inspection and risk assessment of an engineering workshop, report findings and make recommendations	1 Reporting channels and delegated responsibilities	C1
		WA0302 Inspect the statutory registers for an engineering workshop, report findings and recommendations	2 Work records	
			3 Standard operating procedures	
	WM-06-WE04 Contribute to minimising waste and controlling costs	WA0401 Inspect the waste handling practices of an engineering workshop, report findings and make recommendations	1 Reporting channels and delegated responsibilities	C5
		WA0402 Assume responsibility for the consumable store area for a minimum of two weeks, report on stock control practices and formulate recommendations	2 Work records	
			3 Standard operating procedures	
652302000-WM-07: Machining processes to design specifications of a range of work pieces from different materials, NQF Level (60)	WE0701 For a period of two weeks, assist an experienced artisan machining a range of work pieces from different materials on different engineering machines	WA0101 Observe and assist with planning and preparing for the machining tasks, determining of machining specifications from technical drawings or job requests, planning the machining sequence,	1 Standard operating procedures	O1-O3, P1-6, Q1-4, R1-6
		WA0102 Observe and assist with inspection processes, safety procedures, machine set-up and calibration, speed and feed set-up, cutting	2 Equipment operating procedures	

Module	Topic	Guideline for topic	Contextualised Workplace Knowledge	NOCC A21 Learning Area and Work Situation
		tool preparation, securing of accessories and work pieces, lubrication		
		WA0103 Observe and assist with a range of machining tasks on different machining equipment and using different materials		
		WA0104 The experience must include a variety of machining tasks performed on a lathe and a milling machine.		
		WA0105 The experience must include machining of at least 5 different types of materials that cover at least 3 of the following: low alloy steels, high alloy steels, or ferrous metals, non-metallic materials		
		WA0106 The experience must include observing and assisting with machining of at least 10 different work pieces that covers including drilling, tapping and reaming, parting, grooving and knurling, parallel work pieces, the use of a compound slide, external tapers, internal tapers, external threads, internal threads, external radius, external keyways, bushes, the use of a dividing head, the use of a turntable, machining square, cube, hexagon, turning of internal radius.		
	WE0702 Machine a range of work pieces from different materials under supervision	WA0201 Plan and prepare for the machining tasks, determining of machining specifications from technical drawings or job requests, planning the machining sequence under supervision	1 Standard operating procedures	O1-O3, P1-6, Q1-4, R1-6

Module	Topic	Guideline for topic	Contextualised Workplace Knowledge	NOCC A21 Learning Area and Work Situation
	using a range of engineering machines	WA0202 Conduct inspection processes, safety procedures, machine set-up and calibration, speed and feed set-up, cutting tool preparation, securing of accessories and work pieces, lubrication and supervision	2 Equipment operating procedures	
WA0203 Conduct a range of machining tasks on different machining equipment and using different materials under supervision				
WA0204 The experience must include a variety of machining tasks performed on a lathe and a milling machine.				
WA0205 The experience must include machining of at least 5 different materials that covers at least 3 of the following: low alloy steels, high alloy steels, ferrous metals, non-metallic materials				
WA0206 The experience must include observing and assisting with machining of at least 10 different work pieces including drilling, tapping and reaming, parting, grooving and knurling, parallel work pieces, the use of a compound slide, external tapers, internal tapers, external threads, internal threads, external radius, external keyways, bushes, the use of a dividing head, the use of a turntable, machining square, cube, hexagon, turning of internal radius.				
	WE0703 Machine a range of work pieces	WA0301 Plan and prepare for the machining tasks, determining of machining specifications	1 Standard operating procedures	

Module	Topic	Guideline for topic	Contextualised Workplace Knowledge	NOCC A21 Learning Area and Work Situation
	from different materials using a range of engineering machines autonomously	<p>from technical drawings or job requests, planning the machining sequence,</p> <p>WA0302 Conduct inspection processes, safety procedures, machine set-up and calibration, speed and feed set-up, cutting tool preparation, securing of accessories and work pieces, lubrication</p> <p>WA0303 Conduct a range of machining tasks on different machining equipment and using different materials</p> <p>WA0304 The experience must include a variety of machining tasks performed on a lathe and a milling machine.</p> <p>WA0305 The experience must include machining of at least 5 different materials that covers at least 3 of the following: low alloy steels, high alloy steels, ferrous metals, non-metallic materials</p> <p>WA0306 The experience must include observing and assisting with machining of at least 20 different work pieces including drilling, tapping and reaming, parting, grooving and knurling, parallel work pieces, the use of a compound slide, external tapers, internal tapers, external threads, internal threads, external radius, external keyways, bushes, the use of a dividing head, the use of a turntable, machining square, cube, hexagon, turning of internal radius</p>	<p>2 Equipment operating procedures</p>	O1-O3, P1-6, Q1-4, R1-6

Module	Topic	Guideline for topic	Contextualised Workplace Knowledge	NOCC A21 Learning Area and Work Situation
652302000-WE-08: Engineering workshop control processes, NQF Level 4 (10)	WM-08-WE01 Workshop administration and reporting	WA0101 Job card administration and daily workshop reports	1 Administrative procedures	A4, B2
		WA0102 Consumable material orders and receipt of goods		B2
		WA0103 Participate in stocktaking of the consumable materials store on one occasion		B2
	WM-08-WE02 Control workshop store	WA0201 Control the movement of tools	1 Administrative procedures	B2, D1-3
		WA0202 Monitor condition of tools		B2, D1-3
		WA0202 Consumable stock movement and levels		B2