

BQA NCQF QUALIFICATION TEMPLATE

SECTION A: QUALIFICATION DETAILS																						
QUALIFICATION DEVELOPER (S)			Orapa Technical College																			
TITLE		Certificate V in Maintenance Fitting								NCQF LEVEL		5										
STRANDS (where applicable)																						
FIELD		Manufacturing, Engineering and Technology								CREDIT VALUE		367										
SUB FIELD		Engineering and engineering Trades																				
New Qualification		☒		Legacy Qualification				☐		Renewal Qualification				☐								
										Registration Code												
SUB-FRAMEWORK		General Education				☐		TVET		☒		Higher Education		☐								
QUALIFICATION TYPE		Certificate		I		II		III		IV		V		☒		Diploma		Bachelor		☐		
		Bachelor Honours				☐		Post Graduate Certificate				☐		Post Graduate Diploma				☐				
		Masters				☐		Doctorate/ PhD				☐										
RATIONALE AND PURPOSE OF THE QUALIFICATION																						
RATIONALE: The Certificate V in Maintenance Fitting has been developed in response to a clearly identified national need for technically competent Fitters and Turners artisans capable of maintaining and optimising mechanical systems and equipment in various industrial sectors as indicated in (Priority Skills 2023/2024, 2023). The (Priority Skills 2023/2024, 2023) highlights maintenance fitting as one of the critical occupations in high demand across Botswana, particularly within the mining, manufacturing, utilities, and engineering industries. A robust maintenance workforce is pivotal to reducing equipment downtime, enhancing production efficiency, and improving occupational health and safety in the workplace. The demand for Maintenance Fitters is driven by the increasing complexity of mechanical systems, the shift towards																						

preventative maintenance strategies, and the growing importance of sustainability and compliance with environmental and safety standards.

This qualification fills a gap in the current provision of technical education by offering a structured pathway to equip learners with specialised knowledge, practical skills, and workplace competencies. It also addresses national development goals by contributing to the upskilling of the local workforce, improving employment prospects for technical graduates, and supporting industrial growth.

The qualification aligns with national and regional skills development frameworks and contributes to Botswana's ambition of creating a skilled and self-reliant population. It includes unique components such as entrepreneurship training through the CEFE methodology, which encourages self-employment and SME development, further enhancing the qualification's relevance to Botswana's economic diversification agenda.

Informed by international benchmarking against South African and Australian engineering qualifications, this qualification ensures global comparability and provides learners with articulation options both vertically and horizontally within the Technical and Vocational Education and Training (TVET) sub-framework.

PURPOSE: (itemise exit level outcomes)

The purpose of this qualification is to produce graduates with broad technical knowledge, skills and competence to:

- Apply occupational health, safety, and environmental practices to ensure safe working conditions in line with national and international standards.
- Interpret and apply engineering drawings and measurements to accurately machine, fit, and assemble mechanical components and systems.
- Implement maintenance strategies, including preventative, predictive, and corrective maintenance, to enhance asset performance and reliability.
- Diagnose and rectify mechanical faults using appropriate diagnostic methods and repair techniques in a process plant or industrial environment.
- Demonstrate entrepreneurial and communication skills relevant for starting and managing small technical enterprises or operating effectively in diverse team environments

MINIMUM ENTRY REQUIREMENTS (including access and inclusion)

1. A minimum of Certificate IV, NCQF Level 4 or equivalent.

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2. Recognition of Prior Learning (RPL) and Credit Accumulation and Transfer (CAT) will be used for access in line with ETPs and national policies on RPL and CAT.

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SECTION B QUALIFICATION SPECIFICATION	
GRADUATE PROFILE (LEARNING OUTCOMES)	ASSESSMENT CRITERIA
1. Apply occupational health, safety, and environmental regulations in mechanical fitting operations.	1.1 Identify workplace hazards and evaluate associated risks. 1.2 Implement appropriate hazard control and mitigation strategies. 1.3 Demonstrate compliance with safety protocols and environmental procedures during practical tasks
2. Interpret and use engineering drawings, Calculations and technical specifications to guide mechanical fitting tasks.	2.1 Interpret orthographic and isometric projections, sections, and tolerances in order to machine and assemble components to specification. 2.2 Apply drawing information to identify fitting requirements and dimensions. 2.3 Apply Mechanical calculations and concepts in problem solving.
3. Use hand and power tools to produce, assemble, and maintain mechanical components and systems.	3.1 Select and use appropriate tools for specified tasks. 3.2 Demonstrate correct handling, operation, and care of tools to ensure safe and correct use. 3.3 Perform fitting operations to specified tolerances and quality standards.
4. Conduct mechanical maintenance to optimise plant equipment performance	4.1 Identify and apply appropriate maintenance strategies to ensure optimized equipment performance. 4.2 Carry out mechanical maintenance as guided by the available procedures to ensure compliance. 4.3 Record and interpret maintenance data to improve performance

5. Diagnose, Troubleshoot and repair faults in mechanical systems	5.1 Isolate energies and lock-out equipment to prevent re-energising while working. 5.2 Apply systematic fault-finding techniques to identify malfunctions. 5.3 Apply appropriate repair procedures, including part replacement and adjustment. 5.4 Conduct functional tests to verify repairs and ensure operational integrity.
6. Demonstrate in-depth knowledge of mechanical equipment, systems, operation and functionality	6.1. Conduct mechanical equipment anatomization and conceptualization to aid equipment optimization 6.2. Demonstrate comprehensive understanding of system components and their functions 6.3. Interpret drawings, diagrams, and statements to design and construct fluid mechanics circuits. (This includes, but is not limited to, Hydraulics & Pneumatics) 6.4. Interpret, design and construct mechanical-related drawings and diagrams to produce a component. 6.5. Strip and assemble mechanical sub-assemblies with precision and sequencing to display functionality.
7. Demonstrate ability to manage small business venture and solve entrepreneurial problem	7.1. Employ effective oral, written and electronic communication strategies to enhance all business operations. 7.2. Apply business principles according to Competency-based Economics through Formation of Enterprises (CEFE) methodology to guide the Start – up and Management of a small business. 7.3. Apply accounting concepts and methods for evaluating the financial position and performance of the business. 7.4. Work with Computer Applications for creating documents, record business transactions and prepare documents for presentation

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SECTION C	QUALIFICATION STRUCTURE				
COMPONENT	TITLE	Credits Per Relevant NCQF Level			Total Credits
		Level [3]	Level [4]	Level [5]	
FUNDAMENTAL COMPONENT Subjects/ Courses/ Modules/Units	Safety, Health & Environment		2	3	5
	Business communication skills		3	5	8
	Technical Drawing 1		3		3
	Technical mathematics 1		3		3
	Engineering tools and equipment		2	3	5
	Measurements and Marking Out		2	2	4
	Welding Fundamentals		2	3	5
CORE COMPONENT Subjects/Courses / Modules/Units	Engineering Materials		2	8	10
	Professional Business Practice			15	15
	Technical Mathematics 2			15	15
	Technical drawing 2			15	15
	Mechanical Joining Processes		1	5	6

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	Equipment Installation & Alignment			5	5
	Equipment Overhaul			7	7
	Machine Tools		3	12	15
	Power Transmission			5	5
	Material Transfer			5	5
	Ore Processing Equipment			15	15
	Ventilation & dust extraction			2	2
	Plant Maintenance			5	5
	Equipment Lifting & Handling			4	4
	Bearing			6	6
	Lubrication			5	5
	Pipe work		2	2	4
	Hydraulics			5	5
	Pneumatics			5	5
	Workplace Attachment			180	180
STRANDS/ SPECIALIZATION	Subjects/ Courses/ Modules/Units	Credits Per Relevant NCQF Level			Total Credits
		Level []	Level []	Level []	
1.					

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2.					
Electives (Choose 1)	Basic Instrumentation			5	5
	Introduction to Borehole Installation			5	5
	CNC Machining			5	5
	Basic Electrical Principles			5	5
	Fundamentals of Refrigeration and Air Conditioning			5	5

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SUMMARY OF CREDIT DISTRIBUTION FOR EACH COMPONENT PER NCQF LEVEL

TOTAL CREDITS PER NCQF LEVEL

NCQF Level	Credit Value
4	25
5	342
TOTAL CREDITS	367

Rules of Combination:

(Please Indicate combinations for the different constituent components of the qualification)

This qualification consists of the following:

- Fundamental Components
- Core Components
- Elective Components

To be awarded the Qualification, learners are required to obtain a minimum of **367** credits as detailed below:

Fundamental Components:

The Fundamental components consist of foundational knowledge in Maintenance Fitting to the value of **33** credits.

Core Components:

The core components consist of modules containing applied knowledge, practical and workplace skills to the value of **329** credits.

Elective Components:

Learners are to choose one (1) elective to the credit value of **5** credits.

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ASSESSMENT ARRANGEMENTS

This qualification shall be assessed through a combination of Continuous Assessments (Formatives) and Final Examination (Summative).

- Formative assessment shall constitute a **60%** of the final grade.
- Summative assessment shall constitute **40%** of the final grade.

MODERATION ARRANGEMENTS

Internal and External moderations shall be performed by qualified moderators in the same field.

RECOGNITION OF PRIOR LEARNING

There shall be provision of Recognition of Prior Learning for awarding of the qualification using the ETP and National RPL policies.

CREDIT ACCUMULATION AND TRANSFER

There shall be provision of Credit Accumulation and Transfer for awarding of the qualification using the ETP and National CAT policies.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Learning pathway

Vertical

- Diploma in Mechanical Engineering
- Diploma in Mechatronics
- Diploma in Maintenance Fitting

Horizontal

- Certificate V in Borehole Mechanics
- Certificate V in Mechatronics
- Certificate V in Plumbing and Pipe Fitting
- Certificate V in Mechanical Engineering

Diagonal

- Diploma in Vocational Education and Training

Employment pathway

- Maintenance Artisan Fitter
- Machinist

QUALIFICATION AWARD AND CERTIFICATION

The candidate must have met the following requirements to be awarded the qualification:

- All exit level outcomes
- Minimum **367** credit requirements
- Qualification requirements including practical and workplace modules.

Upon completion of the qualification, candidate will be awarded and be issued a certificate (Certificate V in Maintenance Fitting).

SUMMARY OF REGIONAL AND INTERNATIONAL COMPARABILITY

The proposed Certificate V in Maintenance Fitting (Level 5) demonstrates a strong level of comparability with several regional and international qualifications in mechanical fitting and related disciplines. Notably, its structure comprising compulsory knowledge modules and workplace/practical components is consistent with that of the SAQA Occupational Certificates, including Fitter and Turner (QUAL ID: 94020) and Mechanical Fitter (QUAL ID: 94021), both at NQF Level 4. The proposed qualification also aligns well with the Australian MEM40119 Certificate IV in Mechanical Maintenance and the Certificate in Mechanical Engineering (Level 4) in Fitting and Machining/General Engineering, commonly offered in the SADC region.

All these qualifications share key similarities in their intent and occupational focus, aiming to produce competent artisans capable of performing tasks such as overhauling mechanical equipment, maintaining machinery, and applying engineering standards in the workplace. The proposed qualification, like its comparators, is placed under the Manufacturing, Engineering and Technology field and leads to employment outcomes at the artisan level. Additionally, workplace learning forms a core component of all qualifications examined, and assessment criteria consistently demand adherence to recognized mechanical standards.

However, differences do exist. The proposed qualification is pitched at Level 5, making it one level higher than the compared qualifications, which are generally at Level 4. This suggests a slightly more advanced depth of knowledge and complexity in learning outcomes. In terms of credit weighting, the proposed 364-credit structure sits below the 548 credits of SAQA QUAL ID 94020 and 410 credits of SAQA QUAL ID 94021, but above the 280 credits of the regional mechanical engineering certificate. The MEM40119 certificate from Australia does not clearly state credit values or minimum award standards, limiting direct comparison in that regard.

From an articulation perspective, the proposed qualification offers a reasonable progression pathway into more specialized mechanical or maintenance engineering roles. While the SAQA 94020 leans more toward machining-based progression and 94021 into mechanical maintenance, the proposed Certificate V balances both areas. This could potentially allow for horizontal articulation into similar Level 5 qualifications or upward mobility into Level 6 diplomas in mechanical engineering or plant maintenance. The slightly higher level and balanced content also support cross-border recognition and potential credit transfer, especially within regional qualification frameworks such as the SADCQF or through mutual recognition agreements with countries like South Africa and Australia.

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In conclusion, the Certificate V in Maintenance Fitting aligns well with comparable qualifications in terms of content, outcomes, and occupational relevance. Its higher level and balanced structure provide both local relevance and cross-border mobility, supporting both comparability and articulation within the broader technical and vocational education and training (TVET) ecosystem.

REVIEW PERIOD

To keep up to date with the market demand and technological changes, this qualification will be subjected to review every 5 years

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For Official Use Only:

CODE (ID)			
REGISTRATION STATUS	BQA DECISION NO.	REGISTRATION START DATE	REGISTRATION END DATE
LAST DATE FOR ENROLMENT	LAST DATE FOR ACHIEVEMENT		