

BQA NCQF QUALIFICATION TEMPLATE

SECTION A: QUALIFICATION DETAILS																		
QUALIFICATION DEVELOPER (S)			Orapa Technical College															
TITLE		Certificate V in Fabrication and Welding							NCQF LEVEL		5							
STRANDS (where applicable)		N/A																
FIELD		Manufacturing Engineering and Technology							CREDIT VALUE		423							
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 Fabrication and welding has been developed in response to a clearly identified national need for technically competent artisans capable of designing, manufacturing, installing and maintaining components in various industrial sectors. The HRDC Priority Skills Report of 2025 highlights Fabrication and Welding 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 fabricator-																		

welder is driven by the increasing complexity of the modern fabrication and welding industry, 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 broad technical 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 Competency based Economies through Formation of Entrepreneurs (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 Scotland 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:

1. Apply occupational health, safety, and environmental practices to ensure safe working conditions in line with national and international standards.
2. Read and interpret engineering drawings according to drawing specifications and engineering standards.
3. Manufacture components and structures as per design specifications.
4. Install manufactured components to customer and / or operational requirements.
5. Carrying out maintenance on components related to fabrication and welding with the aim to restore functional intent.
6. Demonstrate entrepreneurial and communication skills relevant for starting and managing small technical enterprises or operating effectively in diverse team environment.

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MINIMUM ENTRY REQUIREMENTS (including access and inclusion)

- A minimum of Certificate IV, NCQF Level 4 or equivalent
OR
- 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 fabrication and welding operations.	1.1 Identify potential hazards in the workplace to prevent associated risk 1.2 Evaluate risks associated with identified hazards to assess their impact 1.3 Employ appropriate controls to mitigate hazards.
2. Apply knowledge of appropriate tools and equipment to safely perform fabrication and welding procedures	2.1 Select and use appropriate tools and equipment for the specified task 2.2 Demonstrate correct handling and maintenance of tools and equipment to prolong their life span 2.3 Adhere to standardised procedures for specific tools and equipment to ensure safe working environment
3. Conduct mechanical maintenance to optimise plant equipment performance	3.1 Identify and apply appropriate maintenance strategies to ensure optimized equipment performance. 3.2 Carry out mechanical maintenance as guided by the available procedures to ensure compliance. 3.3 Record and interpret maintenance data to improve performance

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4. Cut materials using different cutting processes available in the fabrication and welding trade	4.1 Select and use the suitable materials and consumables apposite for the task at hand. 4.2 Carry out measuring and layout for cutting as guided by the engineering drawing. 4.3 Apply the appropriate cutting process (thermal, mechanical, etc.) suitable for the task. 4.4 Apply surface protection based on the material chosen, to prevent wear as well as environmental chemical attacks (e.g. corrosion)
5. Join materials using different joining processes that exist in the fabrication and welding trade	5.1 Select and use the appropriate material for joining task to ensure component functionality. 5.2 Apply apposite material joining processes to guarantee a durable and safe seam. 5.3 Carry out functional tests (measuring and weld tests) as means of doing the quality control and ensuring alignment to operational optimization requirements. 5.4 Apply surface protection based on the material chosen, to prevent wear as well as environmental chemical attacks (e.g. corrosion)
6. Form materials according to engineering and work requirements and specifications	6.1 Select and use the appropriate material for forming task to ensure component functionality. 6.2 Calculate the forming allowances and distortion to guarantee accuracy and prevent deformation as well as material wastage. 6.3 Apply the appropriate forming process according to the engineering requirements to obtain a required outcome. 6.4 Install component on equipment and carry out functional tests to ensure optimal operation.
7. Fabricate components and structures according to engineering drawings	7.1 Interpret and verify engineering drawings to guarantee that each piece if installed where it is required. 7.2 Perform fabrication and joining operations to specified tolerances and quality standards to warrant a strong and secure seam.

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	7.3 Carry out functional tests as means of doing the quality control and ensuring that the build quality is of a required standard.
8. Apply knowledge of engineering drawing principles used in construction of components in fabrication and welding	8.1 Demonstrate knowledge of engineering drawing skills in developing fabrication templates according to the required standards. 8.2 Interpret different types of projection drawings in order to conceptualize and visualise solid components. 8.3 Assemble components as guided by engineering drawings.
9. Apply technical mathematical concepts to solve engineering problems.	9.1 Employ arithmetical concepts in ensuring that fabrication limits and tolerances are achieved so as to attain precise seams. 9.2 Demonstrate knowledge of calculating different equipment technical parameters to guarantee optimal performance. 9.3 Perform estimation and costing analysis to reduce material wastage.
10. Demonstrate ability to manage small business venture and solve entrepreneurial problem	10.1 Employ effective oral, written and electronic communication strategies to enhance all business operations. 10.2 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. 10.3 Apply accounting concepts and methods for evaluating the financial position and performance of the business. 10.4 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	Environment, Occupational Health and Safety.		2	3	5
	Technical Drawing 1		8		8
	Business Communication Skills		3	5	8
	Technical Mathematics 1		7		7
	Engineering tools and equipment		4	6	10
	Measuring and marking out		4	4	8
CORE COMPONENT Subjects/Courses/ Modules/Units	Engineering Materials		5	10	15
	Technical Mathematics 2			20	20
	Mechanical Cutting Processes		3	9	12
	Mechanical Joining		6		6
	Thermal Cutting Processes		2	8	10

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	Forming Processes		2	8	10
	Fabrication and Product Assembly		3	7	10
	Pipe work		5	10	15
	Manual Metal Arc Welding		5	15	20
	Gas Welding		2	5	7
	TIG & MIG Welding			10	10
	Plastic Welding		2	6	8
	Structural steel work			6	6
	Quality Control			5	5
	Maintenance Practices			8	8
	Technical Drawing 2			15	15
	Professional Business Practice			15	15
	Workplace Attachment			180	180
STRANDS/ SPECIALIZATION	Subjects/ Courses/ Modules/Units	Credits Per Relevant NCQF Level			Total Credits
		Level [3]	Level [4]	Level [5]	
1.					

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2.					
Electives	CAD			5	5
	Coded welding			5	5
	Hydraulics			5	5
	Pneumatics			5	5
	Basic Rigging			5	5
	Basic electricity		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	63
5	377
TOTAL CREDITS	423

Rules of Combination:

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

This qualification consists of the following:

- Fundamental components offering both NQF level 4 and 5.
- Core components at level 5.

For one to be awarded the qualification, learners are required to obtain a minimum of 423 credits as detailed below:

Fundamental Components

The fundamental components consist of foundational knowledge in key skills modules to the value of 46 credits all of which are compulsory.

Core Components

The core components consist of modules containing applied knowledge, practical and work-place skills in Fabrication and Welding to the value of 377 credits which are compulsory, inclusive of one mandatory elective.

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 will contribute 60% to the final grade.
- Summative assessment will constitute 40% of the final grade.

MODERATION ARRANGEMENTS

Internal and External moderation should be done by qualified moderators in the same field.

RECOGNITION OF PRIOR LEARNING

There will be provision of RPL for award of the qualification using ETP RPL policy in line with the National RPL Policy.

CREDIT ACCUMULATION AND TRANSFER

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

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Vertical Pathway

- Diploma in Fabrication and welding
- Diploma in Welding Inspection
- Diploma in Mechanical Engineering

Horizontal Pathway

- Certificate V – Coded Welding
- Certificate V in Mechanical Engineering

Employment Pathway

- Artisan Boilermaker
- Welding Inspector
- Artisan Fabricator

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- Artisan Welder

QUALIFICATION AWARD AND CERTIFICATION

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

- All exit level outcomes
- Minimum 423 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 Fabrication and Welding).

SUMMARY OF REGIONAL AND INTERNATIONAL COMPARABILITY

The proposed Certificate V in Fabrication and Welding from Orapa Technical College demonstrates strong comparability with both the Occupational Certificate: Boilermaker (NQF Level 4) from CHIETA, South Africa and the MEM40119 Certificate IV in Engineering (Welding) from Australia, while also offering distinct advantages in scope, level, and career pathways. All three qualifications fall within the field of Manufacturing, Engineering, and Technology, specifically under Engineering and Engineering Trades, and share a competency-based approach that integrates knowledge, practical skills, and workplace learning. This ensures that graduates from each program are equipped to operate effectively in industrial settings, with a focus on welding, fabrication, cutting, joining, assembly, quality control, and occupational health and safety.

In comparison to the CHIETA Boilermaker qualification, the Botswana Certificate V in Fabrication and Welding is positioned at a higher NCQF level (Level 5 versus Level 4) and carries a higher credit value (423 versus 395). While the CHIETA qualification emphasizes the boilermaker trade with focused training in fabrication, pipework, cutting, welding, and assembling, the Botswana qualification offers a broader coverage, encompassing multiple welding processes, mechanical maintenance, CAD, hydraulics, electricity, structural steelwork, and quality control. Furthermore, the Botswana qualification integrates entrepreneurship and business practice training through the CEFE methodology, enabling graduates not only to pursue industrial employment but also to develop small enterprises, an element not included in the South African framework. Assessment approaches also differ, with Botswana employing a 60% formative and 40% summative internal assessment model alongside moderation, while CHIETA uses continuous internal assessment supplemented by an external integrated trade test conducted by accredited assessment centres.

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When compared with MEM40119 Certificate IV in Engineering (Welding) from Australia, the Botswana qualification again demonstrates greater breadth and complexity. MEM40119 primarily focuses on core welding processes, fabrication, and technical skills necessary for immediate industry deployment, whereas the Botswana Certificate V in Fabrication and Welding covers additional areas such as mechanical maintenance, multiple welding techniques, CAD, and entrepreneurial competencies. The assessment strategies are aligned in terms of competency-based evaluation; however, the Australian qualification relies on continuous assessment until competency is achieved, while the Botswana model applies weighted formative and summative assessments. Entry requirements also differ, with Botswana requiring a Certificate IV (NCQF Level 4) or equivalent, including RPL and CAT, while MEM40119 assumes vocational readiness as determined by the training provider.

REVIEW PERIOD

This qualification will be reviewed 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	