BOTSWANA Qualifications Authority	**BQA NCQF QUALIFICATION TEMPLATE**

SECTION A:	***QUALIFICATION DETAILS***
QUALIFICATION DEVELOPER (S)	Madirelo Training and Testing Center

TITLE	Certificate IV in Maintenance Fitting	***NCQF LEVEL***	*4*
STRANDS (where applicable)	*1.* *2.* *3. N/A* *4.*		

FIELD	Manufacturing, Engineering and Technology	***SUB-FIELD***	Engineering and engineering trades	***CREDIT VALUE***	*60*

New Qualification		*Legacy Qualification*	

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 Botswana Vision 2036 states that development of the human capital and the informal sector and the micro and small enterprises (MSES) are essential in achieving the VISION 2036 pillars, in particular Sustainable Economic Development and Human and Social Development. Although

Botswana has been fortunate to experience unprecedented economic growth since independence, this has not generated enough jobs to reduceunemployment. The most severely hit group amongst the unemployed is the youth, who account for about 51.7% of the total unemployed, with the 15-19 age group most affected. (Statistics Botswana 2018)

On the same note the Botswana Education and Training Sector Strategic Plan (ETSSP 2015-2020) marks significant milestone in our collective efforts as a nation to bring about a more diversified, knowledge-based economy. Through a planned and careful development of human capital, the ETSSP seeks to refocus our education and training towards fulfillment of social and economic aspirations identified in our Revised National Policy on Education (RNPE)1994, the National Development Plan 11, Vision 2036 and as well as the MillenniumDevelopment Goals. In particular, the ETSSP is intended to strengthen the match between qualifications and labour market requirements, thereby ensuring that education and training outputs are more closely aligned to socio economic development needs of the country. In line with this strategic goal, the Human ResourceDevelopment Council (HRDC2016) report on top occupations in demand has identified mechanics inclusive of maintenance fitting, heavy plant, hydraulics, diesel and auto electrical as some of the priority skills for Transport and Logistics and Mining, Mineral Energy and Water Resources Sectors.

Similarly, the mining industry in Botswana which includes Debswana diamond mining company's mines, Khoemacau mine as well as other industries be in the service category or manufacturing, engineering and technology category use a lot of varied machinery and equipment which needs maintenance from time to time. The maintenance of the machinery and equipment would be difficult without trained people in the field of Maintenance Fitting, as such mining industries as well as others have shown a heavy reliance on Maintenance Fitters and Fitter Machinists due to the nature of their operations.

PURPOSE: (itemise exit level outcomes)

The purpose of the qualification is to produce graduates with broad knowledge, skills, and competencies to:

1. Read, interpret, and construct Engineering Drawings incorporating limits and fits for specific purposes.
2. Demonstrate knowledge of machining processes adhering to limits and fits by applying basic mathematical calculations for solving specific problems.
3. Carry out heat treatment and testing of engineering materials Heat treatment Processes (hardening, annealing, tempering, normalizing, case hardening), Material Testing Methods (hardness, tensile, toughness).

MINIMUM ENTRY REQUIREMENTS (including access and inclusion)

- Any qualification equivalent to Certificate III, NCQF level 3 (TVET/GE) is acceptable.
- Candidates with relevant unaccredited prior learning, through formal, informal, and non-formal education shall be considered for admission through applicable policies of Recognition of Prior Learning (RPL).

(Note: Please use Arial 11 font for completing the template)

SECTION B	***QUALIFICATION SPECIFICATION***
GRADUATE PROFILE (LEARNING OUTCOMES)	***ASSESSMENT CRITERIA***
1. Interpret drawings and specifications and use the appropriate materials, processes, tools and equipment for the task	1.1 Analyze the drawings to be done to determine appropriate drawing equipment to be used. 1.2 Select the appropriate drawing equipment to be used. 1.3 Produce drawings according to task specification; adhere to health, safety and quality standard. 1.4 Perform quality checks on the job done for adherence to quality standard. 1.5 Clean tools and equipment and store them in appropriate places after use. 1.6 Clean and tidy up the work area in accordance with organizational requirements.
2. Apply knowledge of trade calculations and units of measurement to perform a range of mechanical engineering tasks.	2.1 Use number operations to carry out work related calculations. 2.2 Determine ratios, proportions and percentages as needed for specific purposes. 2.3 • Apply measurement techniques for length, area, perimeter, volume, and mass when performing work related calculations. 2.4 Determine the cost of production in relation to labour, materials, and overheads in project undertakings. 2.5 Identify the main features of work-related data and use suitable summary statistics (mean, mode and median) to interpret the data. 2.6 Solve work related mathematical problems through algebraic expressions. 2.7 Solve calculations problems relating to engineering mathematics.
3. Carry out heat treatment and testing of engineering materials Heat treatment	3.1 Operate heat treatment equipment to carry outheat treatment of engineering materials in line with its purpose. 3.2 Complete heat treatment process in accordance with specimen type and process requirements.

Processes (hardening, annealing, tempering, normalizing, case hardening) Material Testing Methods (hardness, tensile, toughness)	3.3 Ensure heat treatment activity minimizes distortion through thermal and transformationstresses. 3.4 Inspect and test engineering materials after heat treatment processes to confirm modified structure of materials. 3.5 Establish techniques for using metal test equipment for each test in accordance with internationally recognized standards. 3.6 Select and prepare test equipment and samples in accordance with task requirements, check standards, and certified reference materials. 3.7 Identify testing equipment that may be damaged, faulty, or out of calibration and apply remedial action. 3.8 Record and interpret test results and document recommendations appropriate in accordance withworksite.
4. Demonstrate knowledge of maintenanceprinciples and work services.	4.1 Study assembling instructions and confirm detailswith the supervisor. 4.2 Identify and select tools for assembling a given equipment according to manufacturer's specification. 4.3 Clean and store components ready for assembling in accordance with instructions. 4.4 Assemble components according to equipment manufacturer's instructions without damage to component or injury to person. 4.5 Adjust the assembled components and test completed assemblies to confirm operation and tolerances according to equipment manufacturersand workshop instructions. 4.6 Complete documents according to equipment manufacturers and workshop instructions. 4.7 Store completed assemblies according to equipment manufacturers and workshopinstructions.
5. Apply Information and Communication Technology for efficient information retrieval, processing as well as communication and collaboration within the context of tourism operations.	5.1 Read and analyse data from a prepared database. 5.2 Enter and manipulate data using ICT tools. 5.3 Display data electronically through charts. 5.4 Manipulate and present information through the selection of appropriate spreadsheet tools.

6. Demonstrate awareness of the basic entrepreneurial concepts associated with business establishment in Botswana.	6.1 Relate the basic entrepreneurial concepts that inform the establishment of a venture. This includes support structures or policies available for entrepreneurs in Botswana. 6.2 Identify entrepreneurship or business opportunities in a field of interest making use of brainstorming and environmental and scanning techniques. 6.3 Consider the various investment strategies and risks associated with your identified business.
7. Communicate effectively with stakeholders, communities, and team members, and understand the social and economic aspects of forestry management.	7.1 Demonstrate negotiation and communication skillsprior to and during work-based learning. 7.2 Perform assigned fundamental and core skills throughout the duration of the work-based learning program. 7.3 Adhere to health and safety requirements at all times. 7.4 Demonstrate problem solving skills as when problems are encountered during the work process. 7.5 Contribute effectively to team work initiatives within the work environment

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*	Information and Communication Technology	0	2	0	2
	Entrepreneurship I	0	3	0	3
CORE COMPONENT	Workshop Processes and Practices	0	10	0	10

Subjects/Courses/ Modules/Units	Engineering Drawing	0	3	0	3
	Maintenance Principles	0	7	0	7
	Heat Treatment and MaterialTesting	0	3	0	3
	Work-Based Learning	0	32	0	32

STRANDS/ SPECIALIZATION	*Subjects/ Courses/ Modules/Units*	***Credits Per Relevant NCQF Level***			***Total Credits***
		Level [ ]	***Level [ ]***	***Level [ ]***	
1.					
2.					
Electives					

SUMMARY OF CREDIT DISTRIBUTION FOR EACH COMPONENT PER NCQF LEVEL	
TOTAL CREDITS PER NCQF LEVEL	
NCQF Level	***Credit Value***
NCQF Level IV	***60***
TOTAL CREDITS	***60***

Rules of Combination:

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

This qualification consists of Fundamentals 4 Credits, Core 21 Credits, Elective Components 3 Credits and 32 credits of industrial attachment. To be awarded the qualification, learners are required to obtain a minimum of 60.

ASSESSMENT ARRANGEMENTS

The weightings for the assessment will be as follows:

1. Formative assessment
The weighting of formative assessment is 60% of the final assessment mark.

2. Summative Assessment
The weighting of summative assessment is 40% of the final assessment mark.

Internal and external assessments are performed in the qualification. Both internal and external assessment are done in-line with the national assessment policy expectations. Assessors must be registered with a recognised relevant regulatory body.

MODERATION ARRANGEMENTS

Internal and external moderation are performed in assessments for the qualification. Both internal and external moderation are done in-line with the national moderation policy expectations. Moderator must be registered with a recognised relevant regulatory body.

RECOGNITION OF PRIOR LEARNING

There shall be provision for award of the qualification through Recognition of Prior Learning (RPL) in accordance with institutional policies in line with the national RPL policy.

CREDIT ACCUMULATION AND TRANSFER

Credits Accumulated and Transfer will be applicable for gaining credits towards graduation and shall be carried out as per ETP policy which is aligned with BQA / national policy.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Horizontal Articulation develops trainees to a semi-skilled level with basic practical skills and knowledgewithin areas of Certificate IV in Maintenance Fitting NCQF level 4.

- Certificate IV in Fitting and Machining
- Certificate IV in Mechanical Engineering
- Certificate IV in Manufacturing Technical Maintenance

Vertical Articulation

Vertical articulation is possible with the following

qualifications:

- Certificate V in Maintenance Fitting
- Certificate V in Manufacturing Technical Maintenance

EMPLOYMENT

The candidate can be employed as a

- Plant operators
- Mechanical Maintenance Technician
- Mechanical Assembler

QUALIFICATION AWARD AND CERTIFICATION

Minimum standards of achievement for the award of the qualification

A candidate is required to achieve the stipulated 60 credits to be awarded Certificate IV in Maintenance Fitting inclusive of the 4 credits for fundamentals, 21 credits for core components, 32 credits for work-based learning and 3 credits for electives. Candidates will be awarded Certificate.

Certification

A certificate will be awarded upon successful completion.

SUMMARY OF REGIONAL AND INTERNATIONAL COMPARABILITY

The qualifications have similarities in

- Modules, most modules are similar, only slight difference in naming the modules.
- Qualification structure. Which all comprises of core, fundamental and electives, also supported by academic progression pathways.
- Pathways – qualifications allow employers and institutions to assess the qualification and place graduates appropriately.
- Qualification rules – The terms or conditions of awarding certificates are of the same format.

The qualifications have differences in;

- Naming of qualifications names differ from one qualification to another.
- Most qualifications have electives which contribute to the final credits for certificate award.
- Credits; same level IV qualification differ in total number of credits.

REVIEW PERIOD
This qualification shall be reviewed every 5 years.

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**	
REVISION DATE:		**NAME OF PROFESSIONAL BODIES/REGULATORY**	