

BQA NCQF QUALIFICATION TEMPLATE

SECTION A:		QUALIFICATION DETAILS													
QUALIFICATION DEVELOPER (S)		Joint Technical Training School, Botswana Defence Force													
TITLE	Certificate V in Automotive Mechanical Engineering										NCQF LEVEL		5		
STRANDS (where applicable)	N/A.														
FIELD	Manufacturing, Engineering and Technology										CREDIT VALUE		260		
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: This qualification is designed to address the emergent need of technicians in Botswana due to the exponential growth of the Automobile Industry in the recent past years. This growth is both in quantity and quality. The industry is advancing owing to incorporation of technology which leads to more complex and robust vehicle systems being introduced. Quantitatively, the influx of imported second hand vehicles from Asian countries and franchised Motor dealers of Botswana has also necessitated skills development in the industry. The need for this qualification was specifically provoked by the same need in the Botswana Defence Force.															

According to the Education and Training Sector Strategic Plan, 'while training programmes are designed to address many of the areas that are important for employers, graduates do not exhibit the characteristics of people who have internalized learning in these areas. This suggests that there are weaknesses in quality and relevance in TVET pedagogy and practice.' ETSSP, (2015 – 2020, Page 30). This important research greatly influenced the development of this qualification to be more occupation focused and provide a better targeted route for graduates, and benefit employers and the economy. According to the Priority Skills Report, March 2025 by the Human Resource Development Council (HRDC), Botswana faces a significant mismatch between graduate skills and the demand in industry, especially in sectors like automobile manufacturing, highlighting the need for qualifications and training programmes that directly address these gaps. This qualification is meant to address the skills mismatch in this regard. Vision 2036 targets transport and logistics services as essential for economic growth for the country, the automotive industry strategically forms part of the service industry and this qualification will contribute positively to the growth of the industry.

A survey was conducted by the qualification developer prior to designing this qualification, this was done to identify limitations in the Automotive Engineering sector. It was found out that most auto mechanics and technicians lacked key skills critical to the industry, this included Computer Aided Design and Manufacturing, Communication Skills, Information Technology Skills as well as basic Management Skills. These skills will make the graduate to be proficient with modern engineering methods to meet the market expectations.

PURPOSE:

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

- i. Troubleshoot and diagnose motor vehicle problems using modern methods and technology.
- ii. Service, Repair and Overhaul all motor vehicle auxiliary systems.
- iii. Apply basic problem-solving techniques and basic research methods.
- iv. Communicate technical mechanical engineering issues to both technical and non-technical persons.

MINIMUM ENTRY REQUIREMENTS (including access and inclusion)

- i. Certificate IV at NCQF level 4 (GE/TVET) or equivalent.

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- ii. Access through RPL and CAT will be provided through ETP policies in line with national RPL and CAT Policies.

SECTION B		QUALIFICATION SPECIFICATION	
GRADUATE PROFILE (LEARNING OUTCOMES)		ASSESSMENT CRITERIA	
1. Apply engineering principles to systematically diagnose and solve problems related to automotive mechanical systems.		1.1 Inspect, test the vehicle and apply proper fault-finding techniques. 1.2 Analyze mechanical faults using the latest vehicle diagnostic machines and devices. 1.3 Interpret information received through diagnosing devices from different computerized systems in the vehicle.	
2. Apply knowledge of mathematics, natural sciences and engineering sciences to applied engineering procedures, processes, systems and methodologies to solve well-defined automotive mechanical engineering problems.		2.1 Carry out necessary calculations to determine efficiency of mechanical components and systems to remedy any eminent problems. 2.2 Use known theories to deduct possible conditions leading to experienced automotive mechanical faults in order to arrive at appropriate solutions to the same.	
3. Demonstrate an understanding of designs of automotive mechanical components and systems within applicable standards, codes of practice and legislation.		3.1 Use established design processes and methodologies to arrive at appropriate solutions in the form of components or systems as may be determined by the requirements arising from the problem. 3.2 Apply knowledge of relevant design languages such as engineering drawing to interpret ideas according to established standards. 3.3 Employ the use of simulating software to determine the efficiency of an automotive mechanical component or system.	

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4. Conduct investigations of automotive mechanical systems problems through locating and searching relevant codes and catalogues, conducting standard tests, experiments and measurements.	4.1 Use appropriate automotive mechanical literature to correct possible errors in vehicle components and systems. 4.2 Carry out standard tests, experiments and measurements to determine causes of automotive mechanical problems and solutions thereto.
5. Use appropriate techniques, resources and modern engineering tools including information technology for the solution of automotive mechanical problems with an awareness of the limitations, restrictions, premises, assumptions and standards.	5.1 Conduct automotive mechanical diagnostics according to industry best practices. 5.2 Search the internet for online manuals and data sheets to be used as reference for correction of arising errors in vehicle systems. 5.3 Apply knowledge of appropriate engineering tools for the performance of tasks at hand.
6. Communicate effectively, both orally and in writing within an engineering environment.	6.1 Compile reports in established automotive mechanical engineering format. 6.2 Apply engineering communication standards in the design and presentation of ideas in engineering drawing format. 6.3 Use the correct automotive mechanical engineering jargon to refer to components and systems.
7. Demonstrate knowledge and understanding of the impact of automotive mechanical engineering activity on the society, and environment as well as commit to professional ethics, responsibilities and norms of engineering technical practice.	7.1 Adhere to established environmental considerations for the disposal of waste. 7.2 Maintain safe and conducive working conditions in the workplace. 7.3 Implement required practices, legislation and limitations of authority to solve ethical dilemmas. 7.4 Demonstrate understanding of the ethical implications of engineering decisions in terms of the impact on environment, the business, costs and trustworthiness.

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8. Demonstrate an understanding of workplace practices to solve automotive mechanical engineering problems consistent with academic learning achieved and also engage in independent and life-long learning through well-developed learning skills.	8.1 Apply basic project management skills such as job scheduling, budget estimates and costing and time management 8.2 Show an understanding of the working environment in terms of company structure and conventions, rules, policies, working hours, dress codes and reporting lines. 8.3 Abide by labour practices used in the workplace in accordance with relevant legislation. 8.4 Recognise workplace safety in accordance with relevant safety, health and environment legislation. 8.5 Employ advanced knowledge and skills that conform to automotive mechanical engineering standards gathered outside the academic learning achieved. 8.6 Demonstrate continued competence through keeping abreast of up-to-date tools and techniques available in the workplace.

SECTION C	QUALIFICATION STRUCTURE				
COMPONENT	TITLE	Credits Per Relevant NCQF Level			Total Credits
		Level [4]	Level [5]	Level [6]	
FUNDAMENTAL COMPONENT	Mathematics		10		10
	Physics		10		10
	Technical Drawing		8		8

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	Computer Technology		6		6
	Workshop Technology		10		10
	Technical Communication		6		6
CORE COMPONENT Subjects/Courses/ Modules/Units		Credits Per Relevant NCQF Level			Total Credits
		Level (4)	Level (5)	Level (6)	
	Troubleshooting and Maintenance Procedures		10		10
	Fluid Power Systems		10		10
	Motor Vehicle Technology		10		10
	Motor Vehicle Science		10		10
	Electrical & Electronics Principles		10		10
	Basic Control and Instrumentation		10		10
	Petrol Engines		10		10
	Diesel Engines		10		10
	Cooling and Lubrication		7		7
	Body & Chassis		7		7
	Transmission		10		10
	Steering and Suspension			10	10
	Braking System		10		10
	Electronic Injection and Ignition		10		10
	Motor Vehicle Practice I		10		10

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	Entrepreneurial Skills		6		6
	Apprenticeship I		20		20
	Apprenticeship II		20		20
STRANDS/ SPECIALIZATION	Subjects/ Courses/ Modules/Units	Credits Per Relevant NCQF Level			Total Credits
		Level [4]	Level [5]	Level [6]	
1.					
Electives	Measurements and Instrumentation		10		10
	Vehicle Electrics		10		10
	Sensors and Data Transfer		10		10
	Ancillary Equipment		10		10

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SUMMARY OF CREDIT DISTRIBUTION FOR EACH COMPONENT PER NCQF LEVEL

TOTAL CREDITS PER NCQF LEVEL

NCQF Level	Credit Value
5	250
6	10
TOTAL CREDITS	260

Rules of Combination:

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

The qualification consists of **260 credits** for Certificate in Automotive Engineering (Mechanical); with **50 credits** Fundamental Components, **190 credits** Core Components and a minimum of **20 credits** made from choosing two (2) Elective Components.

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ASSESSMENT ARRANGEMENTS

ASSESSMENT

Assessment will be integrated, made up of Formative and Summative Assessment. It will be conducted by BQA registered and accredited assessors.

Formative Assessment

Formative assessment will be administered throughout the learning period in the form of written tests and practical and formative assessment shall contribute 50% of the final grade of the course.

Summative Assessment

A summative assessment will be administered at the end of each module. Summative assessment shall contribute 50% to the course final grade.

MODERATION ARRANGEMENTS

Both internal and external moderation will be carried out by BQA registered and accredited moderators in line with ETP policies.

RECOGNITION OF PRIOR LEARNING

Recognition of Prior Learning (RPL) will be in line with the institutional policy and national policy.

CREDIT ACCUMULATION AND TRANSFER

Credit Accumulation and Transfer (CAT) will be in line with the institutional policy and national policy.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Horizontal Articulation

- Certificate V in Heavy Plant Engineering
- Certificate V in Mechanical Engineering
- Certificate V in Mechatronics Engineering

Vertical Articulation

- Diploma in Automobile Engineering
- Diploma in Mechanical Engineering
- Diploma in Industrial Engineering
- Diploma in Mechatronics Engineering

QUALIFICATION AWARD AND CERTIFICATION

Candidates shall be eligible for the award of a Certificate V in Automotive Mechanical Engineering attainment of a 260 credits from the Fundamentals (50 credits), Core (190 credits) and Electives (20 credits).

They shall be given certificates and transcripts.

SUMMARY OF REGIONAL AND INTERNATIONAL COMPARABILITY

This comparability matrix evaluates the alignment between the proposed qualification of *Certificate in Automotive Mechanical Engineering* and the *National Certificate: Automotive Repair and Maintenance* (South Africa), the *National Certificate in Motor Industry (Automotive Engineering)* offered by TVET Colleges in South Africa as well as ICTQual, United Kingdom. The comparison focuses on NQF levels, credit values, curriculum content, assessment methods, and articulation pathways to demonstrate regional equivalency and compliance with accreditation standards.

1. Title of Qualification, NQF Level & Credit Value or Duration

a. Similarities

- i. The Botswana qualification and the South African (Nelson Mandela University) qualification are both positioned at NQF/NCQF Level 5.
- ii. Both run over a 2-year period (except the South African TVET College which is 1 year).
- iii. All qualifications aim to develop competent technicians with both theoretical and practical automotive engineering skills.

b. Differences

- i. Our credit value is 260 credits, which is 100–130 credits more than South Africa's (± 130 –160 for TVETs; 240 for NMU) and the UK (240).
- ii. The additional credits are due to a dedicated trimester for apprenticeship and specialised military modules.
- iii. The South African TVET program is only 1 year long, while ours is 2 years to accommodate broader scope and depth.

2. Main Exit Outcome(s)

a. Similarities

- i. All certificates address vehicle diagnostics, maintenance, and repair.
- ii. They all include the use of technical manuals and diagnostic tools.
- iii. Emphasis on workplace safety, technical communication, and supervisory/workshop operations is common.

b. Differences

- i. Other qualifications cover general automotive systems, while ours includes military weapon control instrumentation.
- ii. Ours adds outcomes related to team leadership, applied research, and problem-solving beyond standard automotive skills.

3. Domains/Modules/Courses/Subjects Covered (Fundamental, Core & Electives)

a. Similarities

- i. Fundamental subjects such as Mathematics, Communication, and Engineering Physics are consistent across all qualifications.
- ii. Core modules across all qualifications cover engines, transmission, suspension, braking, and electrical systems.

b. Differences

- i. The module names and delivery formats vary, but the content aligns closely.
- ii. Our qualification includes military-specific modules such as weapon control systems, which are not present in the others.
- iii. South African and UK qualifications offer hybrid/electric vehicle technology, which is currently not a focus in our qualification.

4. Assessment Strategies and Weightings

a. Similarities

- i. All qualifications use a combination of theory and practical assessments.
- ii. All require workplace-based learning or industrial placement.
- iii. Recognition of Prior Learning (RPL) is permitted across all.

b. Differences

- i. Our assessment model uses a 50% Formative and 50% Summative structure.
- ii. South African and UK qualifications typically use 60/40 or 70/30 Summative/Formative ratios.
- iii. We have a standalone practical trimester (apprenticeship) which counts heavily towards final competency.

5. Qualification Rules and Minimum Standards for the Award of the Qualification

a. Similarities

- i. All qualifications require completion of a majority (50% or more) of modules to be considered for the award.

b. Differences

- i. South African candidates must pass all core and fundamental modules with at least 50%.
- ii. UK candidates must demonstrate competency in all 24 mandatory units.
- iii. To be awarded our qualification, a candidate must complete all 260 credits:
 - Fundamentals: 50 credits
 - Core: 160 credits
 - Electives: 50 credits (including apprenticeship and military modules)

6. Education and Employment Pathways

a. Similarities

- i. All qualifications offer horizontal progression to diplomas in automotive or mechanical engineering.
- ii. All enable vertical progression to Diploma in Mechanical Engineering, Diploma in Automobile Engineering or equivalent .
- iii. Employment outcomes include automotive technician, workshop supervisor, and fleet maintenance manager.

b. Differences

- i. Our qualification supports direct employment in defence forces as military vehicle technicians or weapons instrumentation specialists.
- ii. Others focus more on civilian or commercial automotive sectors and emerging technologies like electric vehicles.

REVIEW PERIOD

The qualification will be reviewed every five years.

For Official Use Only:

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



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