
	<b>BQA NCQF QUALIFICATION TEMPLATE</b>	Document No.	DNCQF.QIDD.GD02
		Issue No.	01
		Effective Date	04/02/2020

SECTION A: QUALIFICATION DETAILS														
<b>QUALIFICATION DEVELOPER (S)</b>				Department of Teacher Training & Technical Education										
<b>TITLE</b>		Certificate V in Automotive Engineering										<b>NCQF LEVEL</b>		V
<b>FIELD</b>		Manufacturing, Engineering and Technology			<b>SUB-FIELD</b>		Automotive Engineering			<b>CREDIT VALUE</b>		176		
New Qualification					√		Review of Existing Qualification							
<b>SUB-FRAMEWORK</b>		General Education					TVET			√		Higher Education		
<b>QUALIFICATION TYPE</b>		Certificate	I	II	III	I	V	√	Diploma	Bachel or				
		Bachelor Honours		Post Graduate Certificate					Post Graduate Diploma					
		Masters					Doctorate/ PhD							
<b>RATIONALE AND PURPOSE OF THE QUALIFICATION</b>														
<p><b>RATIONALE:</b></p> <p>This qualification is tailor made for the Franchised Motor Dealers of Botswana in line with National Development Plan 11 which calls for Public Private Partnership. NDP 11( pg 42) states that Public Private Partnership is intended to assist government in project implementation of various projects as this will augment the resources for undertaking projects in the country and minimize the risks to planning.</p> <p>TVET &amp; Skills Development Sub-Sectors three (3) and nine (9) emphasises on developing high quality and relevant TVET programmes that are related to the needs of the economy. It also calls for rationalization of TVET institutions (ETTSP: Pg 98). This qualification provides a wide coverage and suppleness to match the needs of the industry, learners, employers and entrepreneurs. This is espoused in the National Vision 2036 and contributes to transforming Botswana from a Resource Based Economy to a Knowledge Based Economy.</p> <p>The programme has been tailor made for the Franchised Motor Dealers of Botswana- through Memorandum of Agreement (MoU) with the Ministry of Tertiary Education, Research, Science and Technology.</p>														

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Automotive industry also forms part of the service industry as Vision 2036 emphasizes that transport and logistics services are essential for the economy to support the movement of persons, goods, and services.

### **PURPOSE:**

The purpose of this qualification is to equip graduates with broad technical knowledge, cognitive and practical skills, and competencies to:


- Repair and carryout preventive maintenance of automotive equipment.
- Diagnose and service vehicle systems.
- Apply health and safety skills in all practical works carried out.
- Diagnose and repair advanced transmission system.
- Discuss advanced electronic ignition system.
- Dismantle and assemble engine block and its component.
- Service and repair engine block and its component.


### **ENTRY REQUIREMENTS (including access and inclusion)**


#### **Minimum entry requirement:**


- Certificate IV at NCQF level 4 (General Education or TVET) with at least 20 credits at NCQF level 5.
- Applicants who do not meet the above requirements may be considered through Recognition of Prior Learning (RPL) and Credit Accumulation and Transfer (CAT) Policies in line with the national RPL and CAT Policies

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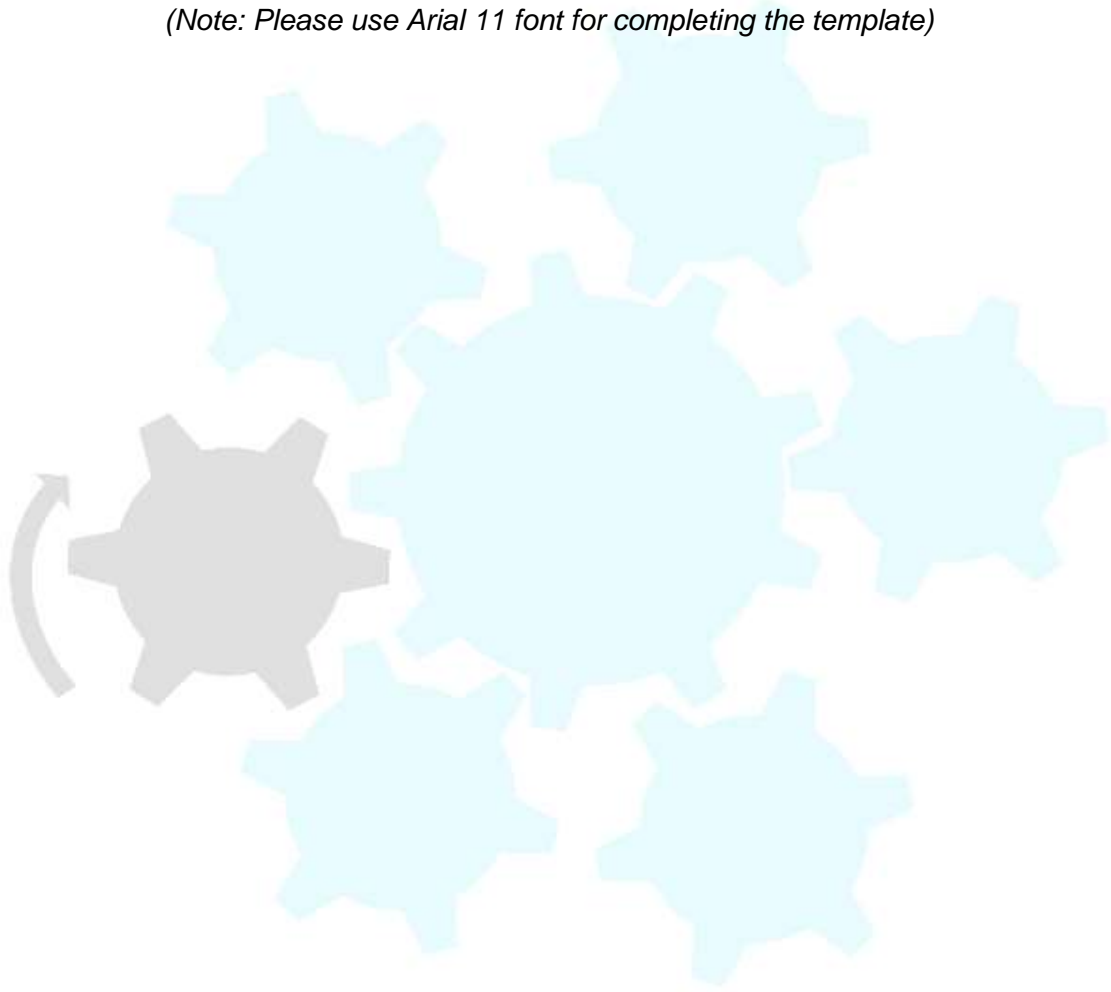
<b>SECTION B QUALIFICATION SPECIFICATION</b>	
<b>GRADUATE PROFILE (LEARNING OUTCOMES)</b>	<b>ASSESSMENT CRITERIA</b>
1.1 Demonstrate broad technical knowledge and skills of vehicle systems diagnose and repair. 	1.1.1 Examine braking system of a vehicle. 1.1.2 Determine the brake operation principles. 1.1.3 Repair braking systems. 1.1.4 Interpret electrical diagrams and schematics. 1.1.5 Examine starting system circuit. 1.1.6 Assess construction of a starter motor. 1.1.7 Illustrate the operational principle of a computerized electronic engine management system. 1.1.8 Assess the function of an electronic control unit. 1.1.9 Examine convectional ignition system. 1.1.10 Test lubrication system of a vehicle. 1.1.11 Study the concept of vehicle systems. 1.1.12 Mend engine lubrication system. 1.1.13 Conduct fuel system repair. 1.1.14 Repair Braking system.
1.2 Apply a broad range of skills to perform motor vehicle service.	1.2.1 Service a fuel system of a vehicle. 1.2.3 Conduct engine system repairs. 1.2.4 Examine sealants in motor vehicles. 1.2.5 Inspect liquids in a fuel system of a vehicle.
1.3 Demonstrate the ability to maintain health and safety in the workplace.	1.3.1 Promote health and safety in the work environment. 1.3.2 Enhance issues of safety in the event of fire in the workplace.


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	<p>1.3.3 Define first aid procedures to be followed.</p> <p>1.3.4 Apply health and safety in the work place.</p>
<p>1.4 Apply broad knowledge and skills of how to conduct service and repair of motor vehicle components.</p> 	<p>1.4.1 Conduct clutch maintenance of a vehicle.</p> <p>1.4.2 Examine packaging and safety procedures for vehicle components.</p> <p>1.4.4 Service suspension &amp; steering system of a vehicle.</p> <p>1.4.5 Carryout maintenance of vehicle components.</p> <p>1.4.6 Repair suspension and steering wheel system.</p> <p>1.4.7 Carry-out repairs on comfort system of a vehicle.</p> <p>1.4.8 Repair a vehicle control system.</p> <p>1.4.9 Examine brake lining wear sensors of a vehicle during service.</p>
<p>1.5 Demonstrate the ability to perform construction arrangement of engine components on a vehicle.</p>	<p>1.5.1 Repair different types of engines.</p> <p>1.5.2 Examine heated engines of vehicles during inspection.</p> <p>1.5.3 Carryout constructional arrangement of engine components.</p> <p>1.5.4 Inspect turbo chargers and intercoolers of vehicles.</p> <p>1.5.5 Use hand tools on construction arrangement of engine components during service of a vehicle.</p>
<p>1.6 Demonstrate broad knowledge and skills on understanding engineering materials.</p>	<p>1.7.1 Determine the use of metallic and non-metallic materials in a vehicle engine.</p> <p>1.7.2 Establish properties for materials used in vehicle engineering.</p> <p>1.7.3 Perform calculations on stress and strain for materials used in vehicles.</p>


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<b>SECTION C</b>	<b>QUALIFICATION STRUCTURE</b>				
<b>FUNDAMENTAL COMPONENT</b> Subjects/ Courses/ Modules/Units	<b>TITLE</b>	<b>Credits Per Relevant NCQF Level</b>			<b>Total</b> <b>(Per Subject/</b> <b>Course/</b> <b>Module/</b> <b>Units)</b>
		<b>Level [ 3 ]</b>	<b>Level [ 4 ]</b>	<b>Level [ 5 ]</b>	
<b>CORE COMPONENT</b> Subjects/Courses/ Modules/Units	Vehicle battery service		3		<b>3</b>
	Braking System		3		<b>3</b>
	Motor Vehicle Service		3		<b>3</b>
	Basic Vehicle Electricity		3		<b>3</b>
	Occupational Health & Safety		3		<b>3</b>
	Introduction to Automotive Technology		3		<b>3</b>
	Fusing Metal		3		<b>3</b>
	Motor Vehicle Basic Repairs		12		<b>12</b>
	Steering & Suspension Systems		3		<b>3</b>
	Clutch		3		<b>3</b>
	Advanced Electronics		4		<b>4</b>

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	Engineering Materials		3		<b>3</b>
	Engine Construction Arrangement		6		<b>6</b>
	Spark Ignition Engine(SI)		4		<b>4</b>
	Compression Ignition Engines			16	<b>16</b>
	Diesel Engine Management System(CI)			12	<b>12</b>
	Engine Systems			18	<b>18</b>
	Fuel and Emission Control			14	<b>14</b>
	Starting System			18	<b>18</b>
	Ignition System			18	<b>18</b>
	Engine Super Chargers			12	<b>12</b>
	Spark Engine Management System (SI)			12	<b>12</b>
<b>ELECTIVE/ OPTIONAL COMPONENT</b>  <i>Subjects/Courses/ Modules/Units</i>					


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<b>SUMMARY OF CREDIT DISTRIBUTION FOR EACH COMPONENT PER NCQF LEVEL</b>	
<b>TOTAL CREDITS PER NCQF LEVEL</b>	
<b>NCQF Level</b>	<b>Credit Value</b>
<b>Level 4</b>	<b>66</b>
<b>Level 5</b>	<b>110</b>
<b>TOTAL CREDITS</b>	<b>176</b>
<b>Rules of Combination:</b> <b>(Please Indicate combinations for the different constituent components of the qualification)</b>	
<ul style="list-style-type: none"> <li>• Modules at level 4 consists of credits to the value of <b>66</b> all of which are compulsory</li> <li>• Modules at level 6 consists of credits to the total value of <b>110</b>all of which are compulsory</li> </ul>	

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## **ASSESSMENT ARRANGEMENTS**

### **Formative assessment**

Formative assessment or continuous assessment to constitute 60%

### **Summative assessment**

Summative assessment to constitute 40%

Overall combined assessment totals 100%

Assessment shall be carried out by BQA registered and accredited assessors.

## **MODERATION ARRANGEMENTS**

### **Internal Moderation:**

Pre-moderation is done by relevant internal structures. Quality assurance of the assessment instruments is conducted prior to administration.

### **External Moderation:**

There will also be external moderation. Moderators must be BQA registered and accredited.

## **RECOGNITION OF PRIOR LEARNING**

There shall be access and award of the qualification using Institutional RPL Policy in line with the National RPL Policy.

## **CREDIT ACCUMULATION AND TRANSFER**

There shall be access and award of credits of the qualification using Institutional Credit Accumulation and Transfer (CAT) Policy in line with the National CAT Policy.


## **PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)**

### **Horizontal Articulation:**

- Certificate in Auto-Electronics
- Certificate in Automotive Electrics and Electronics
- Certificate in Automotive Electrical Engineering

### **Vertical Articulation:**

- Diploma in Automotive Engineering
- Diploma in Automotive Electrical Engineering

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### Employment Pathways:

On successful completion of this qualification the holder may be absorbed in the job market as:

- Auto -mechanic Technician
- Automotive Technician
- Parts Specialist
- Service Advisor
- Automotive Salesperson
- Automotive Service Writer
- Internet Sales Coordinator

### QUALIFICATION AWARD AND CERTIFICATION

#### Qualification award:

For a Candidate to achieve this qualification they must have acquired a minimum of 176 credits. 60% of the total credits must be at level 5. The Candidate should pass all the **CORE** units.

There shall be award of **Certificate in Automotive Engineering** and an official transcript upon successful completion of the qualification.

### REGIONAL AND INTERNATIONAL COMPARABILITY

#### Similarities

Access caters for candidate's with high school certificate and RPL.

The skills and knowledge in this qualification are the same with of the other qualifications except few.

#### Differences

The qualification for some bodies/ institutions consists of generic skills and standalone mathematics & science which is not the case for this qualification since is tailor made


Majority of the skills are not common with the Botswana qualification such as Computer Aided Manufacturing, Automotive Manufacturing Processes, Machining , Product Material & Testing Quality Control , Automation & Mechatronics Flexible System, Electro Pneumatic & Hydraulic

Others did not specify credit value.

**See attachment A**

### REVIEW PERIOD

The qualification will be reviewed every five (5) years or as and when required depending on the changing needs of the market.

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## **REGIONAL AND INTERNATIONAL COMPARABILITY:**

### **Similarities and differences:**

This qualification has been benchmarked against similar Regional and International Qualifications. The Qualification was compared to the following: Kenya Institute of Professional Studies: Kenya, Benjamin Franklin Institute of Technology's: USA, Bahagian Pembangunan: Malaysia (Vehicle Maintenance) and Saskatchewan Polytechnic: Canada.

The qualification consists of generic skills and standalone mathematics and science subjects which is not the case for this qualification since it is tailor made for access for both candidates with high school certificate and those without.

All modules and skills are the same except for ASE Certification.

Majority of the skills are not common with the other qualification such as Computer Aided Manufacturing, Automotive Manufacturing Processes, Machining, Product Material & Testing Quality Control , Automation & Mechatronics Flexible System, Electro Pneumatic and Hydraulic.

The skills and knowledge are the same except for a few.

All qualifications will produce a Technician.

40% are related but the rest differ such as power train, the case might be that it is not tailor made for Botswana. This Qualification is tailor made for specific brands in Botswana (Franchised).