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SECTION A: QUALIFICATION DETAILS


QUALIFICATION DEVELOPER (S)		Gaborone Institution of Professional Studies									
TITLE	Certificate V in Automotive Electrical Engineering								NCQF LEVEL	5	
FIELD	Manufacturing, Engineering and Technology			SUB-FIELD	Automotive Electrical Engineering			CREDIT VALUE	120		
New Qualification					√	Review of Existing 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

It is explained and underlined in Botswana Vision 2036 that; the advancement of human capital and the casual segment along with the little endeavor (MSES) are critical and fundamental in acknowledging and accomplishing the set mainstays of the Vision, especially the Sustainable Economic Development and Human and Social Development. Botswana has been doing admirably as asset-based economy, however, there has been an expansion in youth joblessness maturing from 15 to 25.

Notwithstanding, as per the Botswana National Human Resource Development Strategy (2009-2022), the earnest need to quicken the advancement of another way to deal with human asset improvement arranging got

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apparent during NDP 9 (2003-2009) when without precedent for its history, the nation saw a developing number of jobless tertiary alumni being not able to be consumed by the work showcase that was incomprehensibly described by an aptitude's shortfall. This weight combined with an unsatisfactory degree of work in everyone just as significant levels of youth joblessness, this necessary a major re-examine of Botswana's way to deal with labour arranging. The Botswana Education and Training Sector Strategic Plan (ETSSP) achieves a more broadened information-based economy for the advancement of human capital. It deliberately expects to adjust our instruction and preparing to the Revised National Policy on Education (RNPE) 1994, the National Development Plan and Vision 2036 along with the Millennium Development Plan Goals. A definitive objective is to address the common abilities crisscross, in real terms, the capabilities will be precisely coordinated with the current fast work showcase necessities guaranteeing that instruction and preparing yields are firmly adjusted to the requirements of the financial advancement in Botswana. The Human Resource Development Council (HRDC 2016) report on the top occupations which are right now sought after, has recognized engineers as a portion of the needs for Creative Industries. The reason for this qualification is to furnish students with the principles and the scope of learning required to work successfully in the Automotive Electrical industry. This qualification will empower students to address the difficulties of an industry that has demonstrated a fast increment through the presentation of new innovation in electrical fix techniques in accordance with the vision 2036 of the nation in changing the nation into an information economy during this period of the fourth modern upheaval (NDP 11). This qualification additionally serves to grow new abilities for new innovation. It makes a framework of sound innovative help and openings in a work advertise with a developing interest to perceive individuals for their abilities and to address the difficulties of the car electrical fixing condition.

The essential aptitude that is perceived in this qualification is the capacity to comprehend and apply the pertinent hypothesis of auto electrical development and electronics frameworks so as to fix minor electrics. Hand aptitudes additionally assume a significant job in this qualification and effective students should apply hand abilities in finishing their assignments.

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PURPOSE


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

- Communicate with friends and administrators in a car work setting.
- Maintain workshop apparatuses and hardware.
- Diagnose a vehicle for electrical car fix work.
- Repair minor mishap harm to vehicles.


ENTRY REQUIREMENTS (including access and inclusion)

Access to Certificate V in *Automotive Electrical Engineering* is open to those applicants who have the following:


- NCQF Level 4, Certificate IV in General Education (e.g., Botswana General Certificate Secondary Education, TVET) or equivalent.
- Candidates who do not meet the above requirements but have prior learning knowledge and skills which have not yet been formally recognized, may be considered for admission through undergoing Recognition of Prior Learning (RPL) assessment. The processes and procedures for assessments will be in accordance with relevant institutional RPL policies and procedures.

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SECTION B QUALIFICATION SPECIFICATION	
GRADUATE PROFILE (LEARNING OUTCOMES)	ASSESSMENT CRITERIA
<p>1. Communicate effectively using visual, mathematical and/or language skills in the modes of oral and/or written presentation.</p>	<p>1.1 Prepare documentation for work carried out on vehicle.</p> <p>1.2 Prepare report on battery condition for customer.</p> <p>1.3 Report faulty lifting equipment.</p> <p>1.4 Report on faulty or unsafe power tools.</p> <p>1.5 Report deviations from specified requirements and when providing feedback on the progress and results of the safety, health and environmental management programmes.</p>
<p>2. Maintain automotive workshop tools and equipments.</p>	<p>2.1 Source tools and equipment required for the scope of work from available supplies.</p> <p>2.2 Check tools and equipment condition prior to use.</p> <p>2.3 Replace faulty tools according to workplace procedures.</p> <p>2.4 Use the right tools and equipment's according to the manufacturer's operating guidelines and design for the appropriate task at hand.</p>
<p>3. Apply quality systems in processes to repair and maintain motor vehicles.</p>	<p>3.1 Interpret work instructions / specifications for repair and maintenance work.</p> <p>3.2 Determine requirements of quality systems used in motor vehicle maintenance and repair processes.</p> <p>3.3 Measure a range of components in mechanical and or electrical systems or chassis and integral body parts of a range of motor vehicles.</p> <p>3.4 Test the outcome of work carried out on a range of work processes.</p> <p>3.5 Compile quality reports on work carried out in motor repair and maintenance processes.</p>

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<p>4. Analyse vehicle parts to diagnose failures.</p>	<p>4.1 Interpret Job instruction and prepare for the analysis process.</p> <p>4.2 Conduct tests on the failed part using appropriate testing equipment and diagnose the problem.</p> <p>4.3 Identify safety procedures during the diagnosing and repairing task.</p> <p>4.4 Complete documentation according to company environmental requirements for health and safety.</p>
<p>5. Repair minor auto electrical faulty circuits for proper operation of vehicles.</p>	<p>5.1 Move vehicles in accordance with accepted workplace procedures.</p> <p>5.2 Replace damaged components according to manufacturer specifications.</p> <p>5.3 Describe the consequences of not replacing components correctly in terms of safety hazards and customer satisfaction.</p> <p>5.4 Replace repaired parts in accordance with manufacturer specifications.</p> <p>5.5 Conduct work with due consideration for other team members and overall productivity.</p>
<p>6. Diagnose motor vehicle and components faults to determine course of action to rectify the faults</p>	<p>6.1 Observe safety measures to avoid mishaps.</p> <p>6.2 Use diagnostic equipment properly to quickly identify the faults.</p> <p>6.3 Apply theoretical concepts and principles for identification of the trouble cause.</p> <p>6.4 Repair the faults accurately without trial and error.</p>

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SECTION C		QUALIFICATION STRUCTURE			
COMPONENT	TITLE	Credits Per Relevant NCQF Level			Total <i>(Per Subject/ Course/ Module/ Units)</i>
		Level [4]	Level [5]	Level [6]	
FUNDAMENTAL COMPONENT <i>Subjects/ Courses/ Modules/Units</i>	Introduction to Business Communication	10			10
	Engineering Science and Mathematics		20		20
	Introduction to Computers	10			10
	Engineering Drawing		20		20
CORE COMPONENT <i>Subjects/Courses/ Modules/Units</i>	Automotive Electrical Technology		20		20
	Automotive Electrical Workshop Practice		20		20
	INDUSTRIAL ATTACHMENT		20		20
ELECTIVE/ OPTIONAL COMPONENT <i>Subjects/Courses/ Modules/Units</i>					

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SUMMARY OF CREDIT DISTRIBUTION FOR EACH COMPONENT PER NCQF LEVEL

TOTAL CREDITS PER NCQF LEVEL	
NCQF Level	Credit Value
4	20 Credits
5	100 Credits
TOTAL CREDITS	120 Credits

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

The qualification consists of 120 credits distributed as follows

Level and Credits	Fundamental	Core	Elective
Level 4...credits....20	20 Credits		
Level 5...credits....40	40 Credits		
Level 5...credits....60		60 Credits	
Total Credits	60 Credits	60 Credits	

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ASSESSMENT ARRANGEMENTS

Formative Assessment

Formative assessment will contribute 60% towards the final assessment mark.

Summative assessment:

Integrated assessment, focusing on the achievement of the exit-level outcomes, will be done by means of a written examination at the end of every module (per module) which will contribute 40% to their final assessment mark.

MODERATION ARRANGEMENTS

Both internal and external moderation will be done in-line with the Moderation policy of the Institution. In addition, all Moderators and Assessors must be registered and accredited with Botswana Qualification Authority (BQA).

RECOGNITION OF PRIOR LEARNING

Recognition of prior learning (RPL) will be considered for the award of this qualification

CREDIT ACCUMULATION AND TRANSFER

Any candidate applying for Credit Accumulation and Transfer (CAT) will be expected to provide evidence of such learning.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Academic Pathways

Vertical Articulation

- Diploma in Automotive Electrics,
- Diploma in Automotive Repair
- Diploma in Automotive Motor Mechanic
- Diploma in Electronics engineering
- Diploma in Mechatronics
- Diploma in Automotive Management
- Diploma in Marketing
- Diploma in Human Resources

Horizontal Articulation

- Certificate V in Automotive Repair and Maintenance
- Certificate V in Automotive Diagnostics and Repair
- Certificate V in Electronics Engineering
- Certificate V in Automotive Management
- Certificate V in Workshop Management
- Certificate V in Marketing
- Certificate V in Human resources

Diagonal Articulation

Graduates may progress diagonally between qualifications by presenting a completed qualification or credits towards a qualification in a similar study area and must meet the minimum requirements for admission to the target qualification, which they will often do by virtue of the credits obtained towards an equivalent qualification.


- Certificate in Project Financing,
- Certificate in Purchasing and Supply
- Certificate in Project Logistics

CAREER PATHWAYS

The Certificate in Automotive Electrical engineering cuts across different fields. The following are some positions one can attain after pursuing the certificate:

- Commercial Vehicle Auto electrical repairs & maintenance technician
- Automotive electrical component manufacturer
- Auto electrical instructor
- Auto electrical workshop manager
- Workshop receptionist
- Auto parts manager
- Automotive marketing agent
- Repair and collision estimator

QUALIFICATION AWARD AND CERTIFICATION

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A learner will be awarded Certificate V in Automotive Electrical Engineering after attaining 120 credits. The learner will be issued a certificate and an official transcript. This qualification does not have compensatory awards.

REGIONAL AND INTERNATIONAL COMPARABILITY

The purpose of the conducted International Comparability study was to facilitate the development of a meaningful learning path and its associated curriculum incorporating both theoretical and practical vocational skills which will ensure compatibility, comparability and compliance with existing international Qualification specifications and regulations.

This qualification is part of a series of qualifications in the field of Auto electronics and was compared to similar qualifications, some outcomes-based, in various countries. International comparability with the following car manufacturing countries was attempted, with little success, as there was very little or no information available:

- Japan.
- Korea.
- Sweden.
- France.
- Germany.
- Italy.
- China.

There was also a paucity of information on training offered by car manufacturers to their employees; in other words, vehicle or company-specific training.


In comparing these qualifications to the qualifications in Botswana it is clear that many of the qualifications in New Zealand Botswana are similar, with a few differences. Both the qualifications (New Zealand and Botswana) are streamlined for the needs of that country and therefore there are, quite understandably, some differences between the qualifications of these two countries.

United Kingdom

In comparing these qualifications to the qualifications in Botswana it is clear that many of the qualifications in the United Kingdom and South Africa are similar, with a few differences. Both the qualifications (United Kingdom and Botswana) are streamlined for the needs of that country and therefore there are, quite understandably, some differences between the qualifications of these two countries.

Australia

In comparing this Qualification to these offered in Australia, it is clear that the same competencies are covered by both countries, within their qualifications. Although the implementation and use of these qualifications in each country may be different, the same principles of apprenticeship and/or learnerships are applied. The qualifications

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of both countries are streamlined for the needs of that country, and this points to the differences between the qualifications of the two countries.

South Africa

In comparing these qualifications to the qualifications in South Africa it is clear that many of the qualifications in the Botswana and South Africa are similar, with a few differences. Both the qualifications (Botswana and South Africa) are streamlined for the needs of that country and therefore there are, quite understandably, some differences between the qualifications of these two countries.

This qualification compares favourably with qualifications in South Africa and New Zealand see Appendix A. The Certificate in Automotive and Electrical Engineering is also an entry level programme like in South Africa and New Zealand designed to give learners a solid introductory grounding for their careers in the automotive and mechanical engineering industry. Learners will learn about the principles of general automotive systems, develop the skills to interpret general servicing schedules, and carry out customer and administrative services. They learn about general engineering principles, processes and workshop practices. This qualification also helps learners increase their communication, literacy, mathematics and computer skills. Topics covered in this certificate include but are not limited to electrical technology, engine technology, engineering technology, industry practice, internal combustion engines and vehicle technology. Once learners acquire the Certificate in Automotive and Mechanical Engineering learners they can apply for cross-credits for unit standards from the National Certificate in Motor Industry (Entry Skills) and National Certificate in Mechanical Engineering (Level 2), and become apprentices working alongside an industry employer and continue studying industry-based unit standards. Learners can also choose to continue their qualifications in the Certificate in Applied Technology, specializing in automotive engineering, marine engineering systems, Auto electronics, or welding and fabrication.


Similarities

- The basic methods of assessment include Coursework, Oral Examination, Portfolio of Evidence, Practical Demonstration/Assignment, Practical Examination and Written Examination.
- Another similarity can be seen in the employment pathway with all the qualifications selected citing jobs in the Automotive electrical engineering industry.
- Also, the graduates follow similar employment paths.

Differences

- The duration of study is differing in all the three qualifications.
- The NCQF for the three qualifications range from Level 3-6, which are certificate levels (BQA manual).

REVIEW PERIOD

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This Qualification will be reviewed after every 5 years. However, the qualification can be reviewed when the need arises within the 5-year period

