SECTION A							
QUALIFICATION DEVELOPER	**GABORONE UNIVERSITY COLLEGE OF LAW AND PROFESSIONAL STUDIES**						
TITLE	**CERTIFICATE V IN AUTO-ELECTRICS**				**NCQF LEVEL**		**5**
FIELD	**MANUFACTURING, ENGINEERING AND TECHNOLOGY**		**SUB-FIELD**		**AUTO-ELECTRONICS**		
New qualification	✓		Review of existing qualification				
SUB-FRAMEWORK	General Education		TVET	✓	Higher Education		
QUALIFICATION TYPE	Certificate	✓	Diploma		Bachelor		
	Bachelor Honours		Master		Doctor		
CREDIT VALUE					**130**		

RATIONALE AND PURPOSE OF THE QUALIFICATION

Rationale

The lack of qualified auto-electricians at a level below fully qualified graduate engineers is generally common in Botswana. The HRDS report of 2016 articulates to this end. The report indicates that there is a high shortage of engineers and technicians in the related fields. Notably, the Vision 2036 aspires to grow the engineering sector in Botswana and the strategy clearly mentions the need for increased number of engineers and several related fields.

The NDP11 also indicates the need for hand-on skills qualifications that promote self-reliance and the expansion of SMMEs in Botswana. This qualification will produce graduates that can be able to fill up these gaps. Ideally, there report by the Ministry of Labour and Home Affairs on limited skills shows that there is a huge shortage of engineering professionals. The report articulates that electrical engineer qualified at lower level and artisans are in acute shortage in Botswana. Reports by the Statistics Botswana also indicate that technical professionals are very scarce in Botswana. There is a need to increase the supply and availability of such skills.

The needs assessment survey gathered critical evidence that shows that Botswana is indeed in need of auto-electricians. The country has limited access to qualified electrical engineers. Thus, will bridge the gap. This is particular to the SMMEs in Botswana; such small organisations cannot be able to access the highly qualified electrical engineers. They are therefore set to benefit from this qualification. There is a justified need for this qualification especially considering the growing of the motor vehicle industry in Botswana as well as the expanding car population in the country.

Purpose

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

- Assemble cables, harness and printed circuit or wiring boards.
- Apply mathematical concepts and processes to solve auto-electronics related problems.
- Apply principles and theories of auto-electronics, electrical circuitry, electronic and electrical testing, material science and physics in an auto-electronics environment.
- Demonstrate safety measures in an auto-electronics environment.
- Use both communication, information and technology, and entrepreneurial skills in an auto-electronics environment.
- Apply elementary principles of electricity and electronics in order to layout, build, test, troubleshoot, repair, and modify developmental and production of auto-electronic modules, parts, equipment, and systems, such as computer box.

The purpose of the qualification is to provide the graduate with the necessary theoretical and practical foundation as required by the auto-electrician occupation. It will also help those graduates who wish to further their education in this field to higher qualifications.

ENTRY REQUIREMENTS (including access and inclusion)

i. A minimum entry requirement of NCQF Level IV or equivalent.
ii. Recognition of Prior Learning (RPL) and Credit Accumulation and Transfer (CAT) will be considered for access and inclusion of prospective candidates.

QUALIFICATION SPECIFICATION: SECTION B	
GRADUATE PROFILE	**ASSESSMENT CRITERIA**
1. Demonstrate knowledge of communication, IT	1.1 Apply written, verbal and non-verbal aspects of communication within the auto-electronics environment.

and entrepreneurial skills in an auto-electronics environment	1.2 Use technology to produce reports and communicate accordingly within the auto-electronics environment. 1.3 Prepare formal and informal business communiqués. 1.4 Plan and conduct appointments with clients 1.5 Plan and deliver business presentations.
2. Apply mathematical concepts and processes to solve auto-electronics related problems.	2.1 Demonstrate understanding of the principles and operation of electronic circuits in accordance with circuit and equipment specifications. 2.2 Apply principles of electrical engineering in solving integrated circuit in electronic drawing. 2.3 Interpret and construct electronic circuits according to circuit diagrams and components provided.
3. Demonstrate understanding of principles and theories of auto-electronics, electrical circuitry, electronic and electrical testing, material science and physics in an auto-electronics environment.	3.1 Inspect for non-conformance in electrical and electronic circuits. 3.2 Test and verify the correct operation of equipment in electrical and electronic circuits. 3.3 Identify, repair or replace faulty equipment in electrical circuits accordingly in the correct procedure. 3.4 Monitor, record, maintains electrical and electronic equipment according to correct workshop standards.
4. Assemble cables, harness and printed circuit or wiring boards.	4.1 Perform accurate coding of harnesses. 4.2 Interpret diagrams and parts lists. 4.3 Test cables to comply with wiring diagrams. 4.4 Diagnose and service automobile batteries and battery system components
5. Demonstrate knowledge of operating in a safely and efficient working environment.	5.1 Identify and report basic auto-electrics related problems and hazards according to workplace standards. 5.2 Clean and inspect isolated auto-electrics equipment. 5.3 Apply safety measures in an auto-electronics environment.

QUALIFICATION STRUCTURE: SECTION C

	Title	Level	Credits
FUNDAMENTAL COMPONENT Subjects / Units / Modules /Courses	Mathematics	5	10
	Introduction to Information Technology	5	10
	Entrepreneurial Skills	5	10
	Communication and Study Skills	5	10
	Technical Drawing	5	10
CORE COMPONENT Subjects / Units / Modules /Courses	Auto- Electric Technology	5	15
	Electronic Diagnostic and Repairs	5	15
	Motor Vehicle Technology	5	15
	Health, Safety and Occupation	5	10
	Industrial Attachment	5	25
ELECTIVE COMPONENT Subjects / Units / Modules /Courses	**NONE**		
			130

Rules of combinations, Credit distribution

Fundamental components **=50 credits**

Core components **=80 credits**

Total **130 credits**

MODERATION ARRANGEMENTS

Assessment Arrangements

Assessment shall be conducted by BQA accredited assessors.

The assessment for this qualification shall comprise of both formative and summary assessments weighted according to institutional guidelines and policies. Both formative and summative assessment processes are accounted for to monitor progress during the qualification and to determine competence of the learners at the end of the qualification.

The formative assessment shall consist of contribute 60%.

Summative assessment shall make up the remaining 40%.

Moderation Arrangements

Internal Moderation

- Internal moderators to be engaged will be BQA accredited subject specialists in relevant fields with relevant industry experience and academic qualifications.
- Internal moderation shall be done in accordance with applicable policies and regulations.

External Moderation

- External moderators to be engaged will be subject specialists in relevant fields with relevant industry experience and academic qualifications.
- External moderation shall be done in accordance with applicable policies and regulations.

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.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

LEARNING PATHWAYS

The graduates can progress vertically or horizontally into the following qualifications;

Horizontal Progression

- Certificate V in Mechanical Engineering
- Certificate V in Electronic Technology

- Certificate V in Electrical Installations

Vertical Progression

- Diploma in Auto-Electrics
- Diploma in Electronic Technology
- Diploma in Electrical Installations

EMPLOYMENT PATHWAYS

Upon successful completion of this qualification graduates have a great chance securing employment such as;

- Auto-Electrician
- Artisan
- Workshop Foreman
- Apprentice Trainer

QUALIFICATION AWARD AND CERTIFICATION

Upon successful completion of 130 credits the candidate will be awarded a Certificate V in Auto-Electrics qualification.
The graduate will be given a transcript and a certificate.

REGIONAL AND INTERNATIONAL COMPARABILITY

To establish comparability, benchmarking was conducted on 3 identified similar qualifications internationally and regionally.

Speciss College (Zimbabwe) Certificate in Auto-Electrics

Although the NQF level and credits of this qualification are not indicated, the qualification compares favorably to the proposed qualification in terms of the type of the qualification (certificate) as well as its entry requirement which is “O-level”. When mapped into the NCQF, “O-level” is equivalent to NCQF Level 4-entry requirements for the proposed qualification. The qualifications share similar modules like Health and Safety in the Workplace and many others (different titles) related to auto-electronics and diagnostics like Introduction to Electricity, Batteries, Auxiliary Systems, Charging Systems, Lighting systems and many others. However, unlike the proposed qualification, this qualification does not have generic modules like Communication & Study Skills, Information Technology, Technical Drawing and Entrepreneurial Skills.

SAQA (South Africa) National Certificate: Autotronics

The qualification is at NQF Level 5 and has credit allocation of 130 which is similar to the proposed qualification. NQF level 5 is equivalent to NCQF Level 5. Its entry requirements suggest competency in Communication and Mathematical Literacy at NQF Level 4, this equates to the proposed qualification entry requirements. Although assessment weightings were not indicated, it has formative and summative assessments just like the proposed qualification. Modules such as Communication Skills, Mathematical and Statistical analysis, Diagnostic and repairing automobile, On the job training and many others around auto electrics are similar.

Preston College (UK) Auto-Electrical and Mobile Electrical Principles -Level 3 Diploma

When equating the NQF level of this qualification (RQF Level 3) to NCQF, it is mapped at NCQF Level 5 which makes it equivalent to the proposed qualification. The qualification has modules which are similar to those of the proposed qualification except that the proposed qualification has included generic skills like Communication Skills, Entrepreneurial Skills and Introduction to Information Technology. They share similar core modules in the areas of health and safety, diagnostic and inspection of auto-electronics.

Summary of comparability

A comparison of the proposed qualification with the above shows that the qualification learning outcomes/core modules and duration compares favourably with other qualifications of similar nature from other institutions. Moreover, the proposed qualification has an attachment module which the above qualifications do not have, and generic modules such as Communication Skills, Entrepreneurial Skills and Introduction to Information Technology.

REVIEW PERIOD

The qualification will be reviewed every 5 years.