SECTION A							
QUALIFICATION DEVELOPER	**GABORONE UNIVERSITY COLLEGE OF LAW AND PROFESSIONAL STUDIES**						
TITLE	**DIPLOMA IN ELECTRONICS ENGINEERING**			**NCQF LEVEL**		**6**	
FIELD	**MANUFACTURING, ENGINEERING AND TECHNOLOGY**		**SUB-FIELD**	**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					**395**		

RATIONALE AND PURPOSE OF THE QUALIFICATION

Rationale

Botswana is lagging in local provision of electrical and electronics technicians' services, which has been informally monopolized by foreigners who do not always possess the relevant credentials and whose work will not carry a warrant. As a result of intensive needs assessment, HRDC Priority Skills of 2016 and 2019 as well as the latest of 2021, electronics and electrical technicians are listed as one of the priority occupations. Electronics technicians inspect, diagnose, repair and service electronic aspects and components of machinery and other devices across a wide variety of industries.

It has also been noted that access into higher education is limited mainly to school leavers who have passed extremely well, and yet leaving out post-school youths and adults who are employed and may have acquired learning and experience informally or non-formally and may want to further their careers. This qualification will therefore take into recognition of these prior learning to be a gateway to higher education and further studies in the same field.

Furthermore, to address the need for sustainable development, The National Development Plan (NDP 11) echoed the need for skills development. The central thrust of Botswana's overall strategy for eradication of extreme poverty during NDP 11 will be to provide opportunities for the poor to have sustainable livelihoods (NDP 11: 2017 -2023). This will be achieved by accelerating job creation through vocational training, economic diversification and broad-based growth and strengthening human development of the poor. The

Diploma in Electronics Engineering will assist in job creation within the electronics industry as a whole and will lead to entrepreneurial opportunities for learners. It will also enhance the self-image of each individual learner as they become more self-sufficient.

Purpose

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

- Repair electrical equipment and systems.
- Provide technical support and service in the electronics and electrical environment.
- Design and install electronic systems.
- Produce and operate electronic systems.
- Develop and implement entrepreneurial opportunities.

ENTRY REQUIREMENTS (including access and inclusion)

- A minimum entry of NCQF level IV (BGCSE) or equivalent with credit in basic sciences (Physics and Chemistry)
- Recognition of Prior Learning (RPL) and/or Credit Accumulation Transfer (CAT) will be considered for access and inclusion.

QUALIFICATION SPECIFICATION: SECTION B	
GRADUATE PROFILE (LEARNING OUTCOMES)	**ASSESSMENT CRITERIA**
• Demonstrate advanced knowledge in communicating in variety of ways to achieve personal and workplace objectives within the electronics environment	• Apply written, verbal and non-verbal aspects of communication. • Implement the language and texts used in communication in all contexts. • Prepare formal and informal business communiqués. • Plan and conduct appointments with clients • Plan and deliver business presentations.
• Demonstrate advanced understanding in applying mathematical concepts and	• Apply principles of electrical engineering in solving integrated circuit in electronic drawing.

processes to solve personal and electronics related problems	• Demonstrate the principles and operation of electronic circuits in accordance with circuit and equipment specifications. • Interpret and construct electronic circuits according to circuit diagrams and components provided.
• Apply advanced skills in elementary principles of Electrical and Electronics Engineering	• Use appropriate instruments to measure various engineering parameters • Measure and compute parameters related to electronics engineering • Inspect for non-conformance in electrical and electronic circuits. • Test and verify the correct operation of equipment in in electrical and electronic circuits. • Identify, repair, or replace faulty equipment in electrical circuits accordingly in the correct procedure. • Monitor, record and maintain electrical and electronic equipment according to correct workshop standards.
• Demonstrate advanced knowledge in assembling cables, harness and printed circuit or wiring boards.	• Perform accurate coding of harnesses. • Interpret diagrams and parts lists • Test cables to comply with wiring diagrams.
• Practice safety measures in an electronics environment.	• Use appropriate procedures for preventing environmental pollution and energy conservation • Illustrate the consequences of exposure and poor adherence to health and safety requirements as described in terms of the impact on people and the organization. • Address workplace hazards and risks in accordance with workplace specific health and safety requirements. • Apply measures to deal with workplace hazards and risks in accordance with workplace specific health and safety requirements.

QUALIFICATION STRUCTURE: SECTION C			
FUNDAMENTAL COMPONENT Subjects / Units / Modules /Courses	**Title**	**Level**	**Credits**
	Engineering Mathematics I	6	10
	Engineering Mathematics II	6	14
	Computer Fundamentals	5	14
	Technical communication	5	10
	Entrepreneurship Skills	6	14
CORE COMPONENT Subjects/Courses/Modules/Units	Introduction to Telecommunications	6	12
	Electronic Materials and Devices	6	14
	Electrical and Electronics Principles	6	14
	Electronic Engineering Workshop	5	15
	Electronic Engineering workshop II	6	15
	Electronics Engineering workshop III	6	15
	Analogue Electronics	6	14
	Digital Electronics	6	14
	Audio Electronics	6	14
	Digital Communication Fundamentals	6	14
	Mathematics III	6	14
	Measurements & Instrumentation	6	14
	Physics	6	12
	Health and Safety and the Industry	6	10
	Java Programming	6	15
	Industrial Attachment	6	60
	Project	6	25
	Power Electronics	6	14
	Fundamentals of Digital System Design	6	14
ELECTIVE COMPONENT Subjects / Units / Modules /Courses	**CHOOSE 1 ELECTIVE**		
	Data Communications	6	14
	Wireless Communications	6	14
TOTAL CREDITS			**395**
Rules of combinations, Credit distribution			
Fundamental components: **62 credits** Core components: **319 credits** Elective components (learner must choose 1): **14 credits** Total credits: **395**			

MODERATION ARRANGEMENTS

Assessment and moderation shall be conducted by BQA registered assessors and moderators.

Assessment

Formative assessment shall make 60%.

Summative assessment shall make up the remaining 40%.

Moderation

All assessment tools shall undergo internal and external moderation. The internal and external moderation shall be conducted as ETP policies.

RECOGNITION OF PRIOR LEARNING

There will be provision for awarding this qualification through RPL and CAT in accordance with national and institutional policies.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Learning Pathways:

Vertical

- Bachelor of Engineering in Electronics
- Bachelor of Engineering in Electrical Engineering
- Bachelor of Engineering in Mechanical Engineering

Horizontal

- Diploma in Electrical Engineering
- Diploma in Automotive Engineering
- Diploma in Mechanical Engineering

EMPLOYMENT PATHWAYS

- Electrical and Electronics Technician
- Electrical Maintenance Technician
- Automobile Technician
- Mobile Technology Technician
- Computer Hardware Designer

QUALIFICATION AWARD AND CERTIFICATION

A learner must attain a minimum of 395 credits of this qualification and satisfy the rule of combination above, to be awarded a qualification of Diploma in Electronics Engineering.

Graduates will be issued with certificates and transcripts.

REGIONAL AND INTERNATIONAL COMPARABILITY

To establish comparability, benchmarking was conducted on identified similar qualifications regionally and internationally. The benchmarking was looking at title of the qualification, entry requirements, credits allocation, NQF level at country of origin and either exit level outcomes or modules.

SAQA, South Africa: **Diploma: Electronics Technician**
The qualification is NQF Level 6 which is equivalent to level of the proposed qualification, NCQF level 6. Main exit outcomes point out entrepreneurial skills, ability to communicate effectively which are generic and similar to those of the proposed qualification. The qualification's main core outcomes are centred around electronics.

City and Guilds, UK: **Level 5 IVQ Advanced Technician Diploma in Electrical and Electronic Engineering**
RQF Level 5 equates to NCQF level 6 when mapped onto the NCQF. The qualification offers modules such as Advanced Mathematics, Advanced Electrical Principles, Engineering Project Practical Assignment, and Electrical Plant and Equipment which are core and similar to those of the proposed qualification.

A comparison of the proposed qualification with the above shows that the qualification learning outcomes/core modules compares favourably with other qualifications of similar nature from other institutions/countries. Moreover, the proposed qualification has an industrial attachment and project module which the above qualifications do not have.

Review period

5 years.