SECTION A:	***QUALIFICATION DETAILS***														
QUALIFICATION DEVELOPER (S)	ABM University College														
TITLE	Certificate V in Electrical and Electronic Engineering											***NCQF LEVEL***	**5**		
FIELD	Manufacturing, Engineering and Technology		***SUB-FIELD***		Engineering and engineering trades							***CREDIT VALUE***	**182**		
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:

The electrical and Electronics Engineering field has proved to be the backbone of industrial growth and Economic development in most countries in the world. The field has of late become life-sustaining, cutting across all sectors of the industry. This has resulted in high demand for Electrical and Electronics services in every country in the world. It goes without saying the opportunities in both formal and informal sectors for this field have dramatically increased the world over. This stands true in the context of Botswana as a country. The certificate in Electrical and Electronics Engineering award is intended to produce graduates in Electrical and Electronics engineering who are innovative, enterprising, and highly competent. Graduates should possess life-sustaining skills, competencies, and knowledge.

The qualification also enhances the capacities of the graduate qualifications and abilities for further education in various programs. Reports, Publications, and Research from Regulatory and professional bodies i.e., Engineers Registration Board (ERB), Botswana Institute of Engineering (BIE), Human Resource Development Council (HRDC), Botswana Qualification Authority (BQA) and Ministry of Tertiary Education, Research, Science and Technology all indicate that the field demand will remain high for unforeseeable future. The programme fits well in the national vision 2026. The qualification is well aligned with vision 2036 of a knowledge-based and informed nation. Attention is also given to the Certificate in Electrical and Electronics which seeks to provide quality, globally competitive tertiary education with an emphasis on science, technology, and finance.

The Washington Accord (signed in 1989) guides to this day the trajectory of engineering disciplines globally, and with ERB newly a signatory to these accords, the guidance provided by the expectations of the industry recognizes the necessity of technically sound human capital in the field who can operate at various levels of operation.

Therefore, the need for this Certificate in Electrical and Electronics qualification came about following a research study conducted by ABM University recently, to ascertain the demand for the programme across the country as a viable course in the job market. According to the survey, a number of electrical engineering-related courses such as electronics, telecommunication, control and instrumentation are among the highly needed courses by the participants, precipitated by the need to upgrade their qualifications from certificate level and to match the current demands of the electrical engineering specialists. The findings reveal that Electrical and Electronics Engineering was among the list of qualifications highly in demand in the job market at all levels (certificate, diploma, and degree).

PURPOSE:

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

- Carry out Electrical and Electronics Engineering installations.

- Carry out fault diagnosis, repairs, maintenance, and renovations on Electrical and Electronics equipment and systems.
- Carry out basic manufacturing and fabrication of Electrical and Electronics products.
- Undertake the procurement and supply chain processes of Electrical and Electronic equipment and systems.

ENTRY REQUIREMENTS (including access and inclusion)

Minimum entry:

- Certificate IV, NCQF level 4 (General Education or TVET)
- The candidate may be eligible for exemptions or credit transfers in accordance with the applicable institutional policies.

SECTION B	***QUALIFICATION SPECIFICATION***
GRADUATE PROFILE (LEARNING OUTCOMES)	***ASSESSMENT CRITERIA***
3.1 Demonstrate understanding of Electrical and Electronics Engineering Principles and Technology.	3.1.1 Solve Engineering problems through calculations and schemes. 3.1.2 Apply theorems to solve Engineering problems. 3.1.3 Select appropriate data for tasks at hand
3.2 Interpret drawings, plan, and carry out Electrical and Electronics installations.	3.2.1 Draw layout diagram, schematic and layout diagrams. 3.2.2 List tools and materials required for the task. 3.2.3 Carryout Installations according to diagrams drawn. 3.2.4 Carry test and commission of both new and renovated installations
3.3 Execute fault diagnosis, repairs, maintenance, and renovations on Electrical and Electronics equipment and systems.	3.3.1 List the material and equipment required for the task. 3.3.2 Diagnose and repair faults on equipment and systems. 3.3.3 Maintain equipment and systems. 3.3.4 Produce maintenance records
3.4 Conduct basic manufacturing and fabrication for Electrical and Electronics products.	3.4.1 Draw sketches required for the tasks. 3.4.2 List material and tools required for the task. 3.4.3 Fabricate electrical and electronic casing and enclosure. 3.4.4 Build and assemble circuits. 3.4.5 Fill in job cards and records
3.5 Demonstrate the ability to provide backup support to other fields.	3.5.1 Provide support services to other fields. 3.5.2 Draft support plan for other fields.

3.6 Apply team-building skills for the efficient performance of duties.	3.6.1 Initiate and facilitate teamwork in the workplace. 3.6.2 Contribute to positive work culture
3.7 Apply their understanding of material sciences in project design and implementation.	3.7.1 Identify sources of technical information. 3.7.2 Select the required materials tools and equipment for given tasks. 3.7.3 Use ICT to identify material sources. 3.7.4 Carry out procurement of materials tools and equipment procedurally.
3.8 Demonstrate the ability to work independently in the workplace.	3.8.1 Fill in job plans on given templates. 3.8.2 Draw and write memorandums and reports. 3.8.3 Fill job cards and records. 3.8.4 Write a report on the job done.
3.9 Apply innovative approaches to problem-solving endeavours	3.9.1 Exercise principles of innovation in increasing productivity in the workplace. 3.9.2 Employ interventions aimed at improving efficiency within their organisational unit.
3.10 Exercise a sound application of ethical decision-making	3.10.1 Demonstrate ethical consideration in the performance of their duties. 3.10.2 Apply good judgment on governance issues within their workspace. 3.10.3 Implement ethical standards prescribed within their organisational code of conduct, and governance infrastructure.
3.11 Apply entrepreneurial skills in their work environment	3.11.1 Develop and implement ideas and strategies to improve various aspects of quality products or experiences for their clientele. 3.11.2 Start their own enterprise.

3.12 Exhibit an elevated self-awareness that facilitates organizational excellence	3.12.1 Apply personal mastery principles in managing their workflows and performance. 3.12.2 Exercise emotional intelligence in the workplace. 3.12.3 Contribute to the formation and sustenance of healthy work culture.

SECTION C	***QUALIFICATION STRUCTURE***				
COMPONENT	***TITLE***	***Credits Per Relevant NCQF Level***			***Total*** ***(Per** Subject/ Course/ Module/ Units)*
		Level [4]	***Level [5]***	***Level [6]***	
FUNDAMENTAL COMPONENT *Subjects/ Courses/ Modules/Units*	Governance and Ethics 1		**5**		**5**
	Innovation 1		**5**		**5**
	Entrepreneurship 1		**5**		**5**
	Personal Mastery 1		**5**		**5**
	Communication and Study Skills		**5**		**10**
	Computer Appreciation & Applications		**5**		**10**
CORE COMPONENT *Subjects/Courses/ Modules/Units*	Engineering Mathematics and Science		**5**		**14**
	Electrical Principles		**5**		**12**
	Engineering Drawing		**5**		**14**
	Workshop Practice 1		**5**		**12**
	Electronics Principles		**5**		**12**
	Workshop Practice 2		**5**		**12**

	Introduction to Programming		**5**		**12**
	Industrial Attachments		**5**		**30**
ELECTIVES COMPONENT *Subjects/Courses/ Modules/Units* ***Choose 1 Specialization in either Plant and Installations, Instrumentation and Control, Telecommunications, or Computer Systems. The specialization requires both modules in that field be completed***	Electrical Plant and Installations 1		**5**		**12**
	Electrical Plant and Installations 2		**5**		**12**
	Instrumentation and Control 1		**5**		**12**
	Instrumentation and Control 2		**5**		**12**
	Telecommunications 1		**5**		**12**
	Telecommunications 2		**5**		**12**
	Computer Systems 1		**5**		**12**
	Computer Systems 2		**5**		**12**

SUMMARY OF CREDIT DISTRIBUTION FOR EACH COMPONENT PER NCQF LEVEL	
TOTAL CREDITS PER NCQF LEVEL	
NCQF Level	***Credit Value***
5	***182***
TOTAL CREDITS	***182***

Rules of Combination:

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

A candidate to be awarded the Qualification must complete the minimum of the following:

Fundamentals	Level 5	40 Credits
Core	Level 5	106 Credits
Electives	Level 5	36 Credits
Total		**182 Credits**

ASSESSMENT ARRANGEMENTS

Formative Assessment

- The weighting of Formative Assessment is **60%** of the final grade.

Summative Assessment

- The Final Examination is **40%** of the final grade.

Assessment will be conducted by professionals registered an accredited by BQA as Assessors.

MODERATION ARRANGEMENTS

There will be both internal and external moderation, conducted by professionals registered and accredited by BQA as Moderators.

RECOGNITION OF PRIOR LEARNING

There is a provision for the Award of the qualification through RPL. This will be done with reference to the institution's policy which shall be aligned with the BQA National RPL policy.

CREDIT ACCUMULATION AND TRANSFER

There is a provision for the Award of the qualification through CAT. This will be done with reference to the institution's policy which shall be aligned with the BQA National CAT policy.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

HORIZONTAL PROGRESSION (NCQF LEVEL 5):

- Certificate V in Computer Engineering
- Certificate V in Mechanical Engineering
- Certificate V in Construction Engineering

VERTICAL PROGRESSION (NCQF LEVEL 6):

- Diploma in Electrical and Electronics in Electrical and Electronics Engineering
- Diploma in Mechanical Engineering
- Diploma in Construction Engineering
- Diploma in Computer Engineering

EMPLOYMENT PATHWAYS:

The graduates will have competences to practice as:

- Artisans
- Technicians
- Technical Sales
- Technical procurement
- Self-Employment in Electrical and Electronics Engineering Field

QUALIFICATION AWARD AND CERTIFICATION

Minimum Standard of achievement for the award of the qualification.

Learners will be awarded Certificate V in Electrical and Electronics Engineering qualification upon attainment of a **minimum of 182 credits**.
There will be the issuance of a certificate and an official transcript at the award.

REGIONAL AND INTERNATIONAL COMPARABILITY

This qualification compares with the following:

i) City and Guilds of London U.K Certificate in Electrical and Electronics Engineering, (NQF Level 5) worth 120 Credits which produces candidates with competence to install, maintain, repair and service.

ii) Zimbabwe High Examination Council Certificate in Electrical Power Engineering (NQF Level 5) worth 150 credits which develops competencies to install, maintain, repair and service.

iii) Other qualifications offered in countries such as Zimbabwe, the United Kingdom, Kenya and India which generally emphasize the development of competencies in installation, maintenance, repairs and servicing.

The proposed qualification generally compares well with all the qualifications studied since the exit outcomes cover similar scope and depth and are aligned to exit-level descriptors typical of this level and type of qualification as done within the region and beyond as well as competencies required for registration and accreditation with professional bodies such as Ministry of Higher and Tertiary Education Zimbabwe and UK Higher Examination Council. This qualification articulates the overall necessary competencies required for electrical engineering artisans.

However, what sets it apart from the qualifications examined, is that there is provision for the holistic development of self-aware industry practitioners who can propel themselves into either employment or

entrepreneurship. Moreover, the learning duration speaks to the additional competencies in innovation, entrepreneurship, personal mastery and governance. In comparison to the benchmarked qualifications, the course duration ranges from one (1) year to two (2) years, and the duration of this learning experience will be one and half (1.5) years.
REVIEW PERIOD
This qualification will be reviewed after 5 years