SECTION A:	***QUALIFICATION DETAILS***																
QUALIFICATION DEVELOPER (S)	ABM UNIVERSITY COLLEGE																
TITLE	DIPLOMA IN ELECTRICAL AND ELECTRONIC ENGINEERING													***NCQF LEVEL***	**6**		
FIELD	MANUFACTURING, ENGINEERING, AND TECHNOLOGY		***SUB-FIELD***	ENGINEERING AND ENGINEERING TRADES										***CREDIT VALUE***	**3 9 6**		
New Qualification		**X**	*Review of Existing Qualification*														
SUB-FRAMEWORK	*General Education*		*TVET*										*Higher Education*	**X**			
QUALIFICATION TYPE	*Certificate*	*I*		*II*		*III*		*IV*		*V*		*Diploma*	**X**	*Bachelor*			
	Bachelor Honours		*Post Graduate Certificate*									*Post Graduate Diploma*					
	Masters							*Doctorate/ PhD*									

RATIONALE AND PURPOSE OF THE QUALIFICATION

Electrical and Electronics Engineering field is integral to the fourth industrial revolution, thus the backbone of the model life, where power generation, transport and communication is key to mankind. The fourth industrial revolution systems dictates for modern technology for innovation to meet society's communication, tech and energy needs. The field have of late become life sustaining, cutting across all sectors of the industry. This has resulted in high demand of Electrical and Electronics services in every country in the world. Provision of training in the field of Electrical and Electronics Engineering gives any country of origin a competitive edge in both formal and informal. This stands true in the context of Botswana as a country. Diploma in Electrical and Electronics Engineering award is intended produce graduates who are innovative, enterprising and highly competent. Graduates should possess life

sustaining skills, competencies and knowledge. It also enhances the capacities of the graduate qualifications and abilities for further education on various programs. Reports, publications and researches from Regulatory and professional bodies i.e. Engineering Registration Board (ERB), Botswana Institute of Engineers (BIE), Human Resources Development Council (HRDC), Botswana Qualification Authority (BQA) and Ministry of Education and Skills Development (MoED) all indicate that the field demand will remain high for unforeseeable future. Development and provision of the programme is the right platform towards the achievement of the national vision 2036. The qualification is well aligned with vision 2036 of knowledge based and informed nation. What with the rapid expansion of the technology sector over the last few decades, the demand for those who can create, understand and alter electrical control systems has risen accordingly.

PURPOSE:

The purpose of this qualification is to produce graduates with can:

1. Apply their broad theoretical knowledge in the field of Electrical and Electronics Engineering.
2. Utilize critical analysis in solving engineering problems
3. Develop and design engineering-based products
4. Execute different aspects of engineering operations

ENTRY REQUIREMENTS (including access and inclusion)

Direct Entry

A minimum of NCQF level IV or equivalent (General Education or TVET)

Core Subjects:

English: (D)
Mathematics: (C)
Science: (C)
Computer Science is an advantage

Recognition of Prior Learning Scheme

The candidate may be eligible for exemptions or credit transfer in accordance with the applicable institutional policies. Learners eligible for credit transfer must apply for exemptions and will be subjected to institutional policies concerning exemptions and credit transfer.

SECTION B	***QUALIFICATION SPECIFICATION***
GRADUATE PROFILE (LEARNING OUTCOMES)	***ASSESSMENT CRITERIA***
3.1 Demonstrate knowledge of the different aspects of Electrical and Electronic Engineering (EEE) that are relevant to their operations	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 Demonstrate an applied knowledge of the sub-fields of EEE.	3.2.1 Draw and interpret layout diagram, schematic and layout diagrams. 3.2.2 List materials required for the task 3.2.3 Carryout Installations and repair according to diagrams drawn. 3.2.4 Carry test and commission of both new and renovated installations.
3.3 Integrate mathematical concepts in completing operational assignment	3.3.1 Solve Engineering problems through calculations and schemes. 3.3.2 Apply theorems to solve Engineering problems. 3.3.3 Select appropriate data for tasks at hand.
3.4 Formulate simple EEE solutions for daily operations	3.4.1 Apply relevant electrical engineering principles to solve everyday problems. 3.4.2 Use relevant technology for business advancement.
3.5 Demonstrate knowledge in 21st Century skills to everyday and arbitrary business problems related to EEE	3.5.1 Apply necessary skills to solve business problems 3.5.2 Use technology to leverage the business
3.6 Evaluate own practice in relation to professional practice standards, relevant statutes, and regulations to inform the delivery of	3.6.1 Comply to Ethics and Codes of Conduct of engineering. 3.6.2 Apply relevant engineering local & international standards.

quality services in accordance with practice standards and established code of practice.	3.6.3 Apply relevant engineering statutes.
3.7 Apply innovative approaches to problem solving endeavours	3.7.1 Exercise principles of innovation in increasing productivity in the workplace. 3.7.2 Employ interventions aimed at improving efficiency within their organisational unit.
3.8 Exercise a sound application of ethical decision-making	3.8.1 Demonstrate ethical consideration in the performance of their duties. 3.8.2 Apply good judgment on governance issues within their workspace. 3.8.3 Implement ethical standards prescribed within their organisational code of conduct, and governance infrastructure.
3.9 Operate independently in the workplace.	3.9.1 Fill in job plans on given templates 3.9.2 Draw and write memorandums and reports. 3.9.3 Fill job cards and records 3.9.4 Write report on job done
3.10 Apply their understanding of material sciences in project design and implementation	3.10.1 Identify sources of technical information. 3.10.2 Select the required materials tools and equipment for given tasks. 3.10.3 Use ICT to identify material sources 3.10.4 Carry out procurement materials tools and equipment procedurally.
3.11 Apply entrepreneurial skills in their work environment	3.11.1 Develop and implement ideas and strategies to improve various aspects of quality product or experience 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 [5]	***Level [6]***	***Level [7]***	
FUNDAMENTAL COMPONENT *Subjects/ Courses/ Modules/Units*	Computer Appreciation & Applications	**10**			**10**
	Communication & Study Skills	**10**			**10**
	Project Management	**10**			**10**
	Entrepreneurship 1	**5**			**5**
	Personal Mastery 1	**5**			**5**
	Ethics 1	**5**			**5**
	Innovation 1	**5**			**5**
	Entrepreneurship 2		**6**		**5**
	Personal Mastery 2		**6**		**5**
	Ethics 2		**6**		**5**
	Innovation 2		**6**		**5**
CORE COMPONENT	Engineering Drawing		***12***		**12**
	Computer Aided Drawing		**12**		**12**

Subjects/Courses/ Modules/Units	Engineering Science 1	**10**			**10**
	Engineering Design		**12**		**12**
	Wiring and Testing Electrical and Electronics Circuits		**12**		**12**
	Electrical and Electronics Principles		**12**		**12**
	Digital Electronics		**12**		**12**
	Engineering Mathematics 1	**10**			**10**
	Engineering Science 2		**12**		**12**
	Electrical Machines and Drives		**12**		**12**
	Electrical Installation and Maintenance		**12**		**12**
	Engineering Health and Safety Management		**12**		**12**
	Engineering Science 3		**12**		**12**
	Engineering Mathematics 2	**10**			**10**
	Microprocessor Based Systems		**12**		**12**
	Mechatronic Principles and Practice		**12**		**12**
	Engineering Mathematics 3		**12**		**12**
	Engineering Mathematics 4		**12**		**12**
	Programming in C		**12**		**12**

	Principles of Analogue Circuits		**12**		**12**
	Industrial Atta		**12**		**20**
ELECTIVE/ OPTIONAL COMPONENT *Subjects/Courses/ Modules/Units* ***Learners in their third (3) year choose to specialize either in electronics or power.***	***ELECTRONICS***				
	Sequential and Combinational Logic Circuits			**12**	**12**
	Instrumentation and Control			**12**	**12**
	Data Communications and Network Systems			**12**	**12**
	Smart Electronics			**12**	**12**
	State Space Control			**12**	**12**
	Analogue Design			**12**	**12**
	POWER				
	Power Systems			**12**	**12**
	Energy System and Conversion			**12**	**12**
	Electrical Supply and Distribution			**12**	**12**
	Electrical Machine Design			**12**	**12**
	Power Electronics			**12**	**12**
	Principles and Operations of Electrical Machines			**12**	**12**

SUMMARY OF CREDIT DISTRIBUTION FOR EACH COMPONENT PER NCQF LEVEL	
TOTAL CREDITS PER NCQF LEVEL	
NCQF Level	***Credit Value***
5	***80***
6	***244***
7	***72***
TOTAL CREDITS	***396***

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	44 Credits
Fundamentals	Level 6	20 Credits
Core	Level 5	36 Credits
Core	Level 6	224 Credits
Core	Level 7	72 Credits
Total		**396 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 provision for Award of the qualification through RPL. This will be done with reference to the institution's policy which shall be aligned to the BQA National RPL policy.

CREDIT ACCUMULATION AND TRANSFER

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

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Horizontal Articulation (NCQF Level 6)

- Diploma in Telecommunication Engineering
- Diploma in Computer Engineering
- Diploma in Mechanical Engineering
- Diploma in Computer Engineering

***Vertical Articulation* (NCQF Level 7)**

- Bachelor of Engineering in Electrical and Electronic Engineering
- Bachelor of Engineering in Computer Engineering
- Bachelor of Engineering in Mechanical Engineering

Employment:

Graduates will have requisite competencies and attributes to work as:

- Electrical Engineering Technician

- Electronic Engineering Technician
- Electrical Design Engineering Technician
- Electrical Instrumentation & Control Engineering Technician
- Technical Sales Technician
- Technical Procurement
- Assistant Technical Project Supervisor

QUALIFICATION AWARD AND CERTIFICATION

Minimum Standard of achievement for the award of the qualification.

Leaners will be awarded Diploma in Electrical and Electronics Engineering qualification upon attainment of a **minimum of 396 credits**.

There will be issuance of a certificate and an official transcript at award.

REGIONAL AND INTERNATIONAL COMPARABILITY

This qualification has been benchmarked with the following:

10.1 Central Technical College (South Africa): National Diploma N6: Electrical and Electronics Engineering: NQF Level 6, 120 Credits

10.2 City and Guilds (U.K): Level 5 Diploma in Electrical and Electronics Engineering, QCF Level 4, 200 Credits

10.3 Other qualifications offered in countries such as United Kingdom and Australia which generally emphasize development of competencies in research, undertake design work, use mathematical and computer models, solve engineering problems, undertake practical work and demonstrate awareness of leading-edge knowledge.

This 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. What sets this qualification apart from the ones examined, is that there is provision for development of attributes such as a life-long commitment to learning and further study as part of professional development and understanding of enterprise and entrepreneurship which are critical for global citizenship.

REVIEW PERIOD

This qualification will be reviewed after five 5 years.