SECTION A:	***QUALIFICATION DETAILS***																	
QUALIFICATION DEVELOPER (S)	*UNIVERISTY OF BOTSWANA*																	
TITLE	*BACHELOR OF EDUCATION IN BIOLOGY*															***NCQF LEVEL***	*7*	
FIELD	*Education and Training*			***SUB-FIELD***	*Biology Education*											***CREDIT VALUE***	*508*	
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 economic strength of any country is linked to its advancements in Science, Mathematics, Technology, and Engineering (STEM) disciplines. This sentiment is embraced globally and is articulated well in the Sustainable Development Goals (SDGs, Goal 4: provision of quality education) and the Africa Agenda 2063 (Aspiration 1: A prosperous Africa based on inclusive growth and sustainable development and, Aspiration 6: An Africa whose development is people-driven …). The Government of Botswana has since realized this, as evidenced in policy documents such as Vision 2036 (Pillar 1: Sustainable Economic Development – to produce productive and competitive human resources that drive growth across economic sectors including emerging industry, and 2)

Pillar 2: Human and Social Development– Education and Skills Development – to provide relevant quality education that is outcome-based with an emphasis on technical and vocational skills as well as academic competencies), National Development Plans, the Revised National Policy on Education (RNPE, 1994), and the Education and Training Sector Strategic Plan (ETSSP, 2015-20). These policies call for, by implication, the training of science related subject teachers to assist the country in its endeavor to improve and diversify its economy into the knowledge based one. The importance of these subjects in the dispensation in which the knowledge economy runs supreme cannot be emphasized as they are the basis for innovation.

This realization is underscored by the National Policy on Research, Science, Technology and Innovation of 2011 that recognizes the value of these disciplines on technology and innovation and the need to include them in the school curriculum with view to influencing change.

PURPOSE:

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

- Undertake continuous assessment and evaluation of teaching and learning of Biology.
- Demonstrate the use of technology to enhance the teaching and learning of Biology.
- Demonstrate a culture of creativity, innovation, and knowledge creation in biological contexts.
- Create learning environments that support all learners in Biology learning.
- Investigate scientific problems that require biological understanding.
- Demonstrate comprehension of data and/or reports dealing with biological research reports.

ENTRY REQUIREMENTS (including access and inclusion)

The normal minimum requirements for entry to the Bachelor of Education (Science) Degree programme shall be:

- Certificate IV, NCQF Level 4 (BGCSE or Equivalent)
- Direct entry application through Recognition of Prior Learning (RPL) and Credit Accumulation and Transfer (CAT) is accessible to all applicants through institutional policies in line with the national RPL and CAT policies.

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SECTION B	***QUALIFICATION SPECIFICATION***
GRADUATE PROFILE (LEARNING OUTCOMES)	***ASSESSMENT CRITERIA***
LO1: Exhibit knowledge of Biology content, pedagogy and learners to design and execute classroom instruction.	AC1.1 Select and sequence biology content to meet the cognitive level of the learners AC1.2 Demonstrate knowledge of the interconnectedness of topics within and between biology disciplines AC1.3 Design instructional strategies that are appropriate to achieve effective teaching and learning of biology
LO2: Engage in continuous assessment and evaluation of teaching and learning.	AC2.1 Recognise and utilise multiple assessment strategies and systematically gather data to monitor learners' academic progress AC2.2 Use assessment data to evaluate teaching and learning to guide decision making on instructional processes
LO3: Create learning environments that support all learners.	AC3.1 Provide activities that support learners' academic, intellectual, and social development. AC3.2 Cater for learners' diverse socio-cultural backgrounds and needs
LO4: Use technology to enhance teaching and learning.	AC4.1 Utilise appropriate technologies in the teaching and learning Biology. AC4.2 Empower learners to use available technologies in learning and in real life situations/applications

	of the subject Biology. AC4.3 Use Biology knowledge to design and carry out investigations on scientific problems of biological nature.
LO5: Appraise the value of continuing professional development.	AC5.1 Engage in on-going reflective practices and use evidence to continually evaluate practice to adapt instruction to meet the needs of the learner. AC5.2 Engage in school-based professional development activities to address contextual challenges affecting the teaching and learning of Biology. AC5.3 AC5.4 Conduct action research on issues affecting teaching and learning.
LO6: Adhere to ethics of the teaching profession.	AC6.1 Adhere to the legal aspects of teaching including the rights of learners and parents, as well as the legal rights and responsibilities of the teacher. AC6.2 Evaluate effects of learner actions and choices to provide remediation.
LO7: Cultivate a culture of creativity, innovation, and knowledge creation.	AC7.1 Demonstrate inquiry, critical thinking and problem solving, and entrepreneurship skills. AC7.2 Engage learners in activities that foster creativity, innovation, and entrepreneurship skills. AC7.3 Conduct and produce research reports both in the educational and/or scientific spheres.
LO8: Demonstrate knowledge and understanding	AC8.1 Demonstrate knowledge of basic biological

of contemporary theories, principles, and concepts in Biology that can form the basis for professional judgments and/or formulation of research problems in the subject.	principles and concepts in different sub-disciplines of the subject. AC8.2 Identify problems and develop ways to solve them through proper formulation of research questions and problems.

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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 Skills Fundamental I	***8***			***8***
	Computer Skills Fundamental II		***8***		***8***
	Communication and Academic Literacy Skills (Science)	***12***			***12***
	Academic and Professional Communication		***12***		***12***
	Introduction to Research Methods in Mathematics and Science			***8***	***8***
	ICT for the Biology Teacher			***8***	***8***
	Further Issues in ICT for the Biology Teacher			***8***	***8***

	Introductory Mathematics I	***16***			***16***
	Introductory Mathematics II		***16***		***16***
CORE COMPONENT *Subjects/Courses/ Modules/Units*	Principles of Biology	***16***			***16***
	Diversity of Animals and Plants		***16***		***16***
	Introduction to Educational Psychology	***12***			***12***
	Historical, Philosophical and Sociological Foundations of Education		***12***		***12***
	Teaching Practice I		***12***		***12***
	Teaching Practice II			***12***	***12***
	Cell Biology		***12***		***12***
	Introduction to Mammalian Physiology		***12***		***12***
	Biology of Flowering Plants		***12***		***12***
	Genetics		***12***		***12***
	Plant Structure and Function		***12***		***12***
	General Microbiology			***12***	***12***
	Basic Teaching Methods in		***12***		***12***

	Secondary School Science				
	Practicum in Secondary School Science		***12***		***12***
	Biochemistry			***12***	***12***
	Plant Physiology			***12***	***12***
	Comparative Vertebrate Physiology			***12***	***12***
	Principles of Ecology			***12***	***12***
	Developmental Biology			***12***	***12***
	Molecular Biology			***12***	***12***
	Introduction to Exceptional Children	***12***			***12***
	Teaching in the Contemporary Biology Classroom			***12***	***12***
	Advanced Practicum in School Biology Teaching			***12***	***12***
	Biotechnology			***12***	***12***
	Evolution			***12***	***12***
	Plant Systematics			***12***	***12***

	Food Microbiology			***12***	***12***
	Critical Debates in Biology Education			***12***	***12***
	Introduction to the History and Philosophy of Science			***8***	***8***
ELECTIVE/ OPTIONAL COMPONENT *Subjects/Courses/ Modules/Units*					
	General Chemistry	***16***	***16***		***32***
	Geometrical Optics and Mechanics	16			16
	Electricity, Mechanism, and Elements of Modern Physics		16		16
	Human Impact on the Environment			8	8
	Development and Evaluation of Investigative Work in School Science			8	***8***
	Contemporary Issues in Science Education			8	8
	Research Project in Mathematics/Science Education			8	***8***
	Curriculum Theory and			12	12

	Instruction				
	Contemporary Issues in Teacher Education in Botswana			12	***12***

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SUMMARY OF CREDIT DISTRIBUTION FOR EACH COMPONENT PER NCQF LEVEL	
TOTAL CREDITS PER NCQF LEVEL	
NCQF Level	***Credit Value***
5	***80***
6	***188***
7	***240***
TOTAL CREDITS	***508***

Rules of Combination:

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

To be awarded the qualification, a student must accumulate at least 508 credits composed of:

- 96 credits Fundamental modules
- 352 credits of Core modules
- 60 credits of Optional/elective modules

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ASSESSMENT ARRANGEMENTS

Assessment:

- There shall be both formative and summative assessments in the ratio 50:50.
- All assessments shall be carried out by BQA registered and accredited assessors

MODERATION ARRANGEMENTS

Moderation:

- There shall be both internal and external moderation in line with the institutional policies in place for quality assurance purposes.
- All moderators shall be BQA registered and accredited.

RECOGNITION OF PRIOR LEARNING

- There shall be provision for award of this qualification through RPL in line with the existing institutional RPL and national RPL policies

CREDIT ACCUMULATION AND TRANSFER

- There shall also be provision for Credit Accumulation Transfer (CAT) in line with existing institutional and national policies

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Learning Pathways

Horizontal Articulation

- Bachelor of Science
- Bachelor of Education (Chemistry)
- Bachelor of Education (Physics)

- Bachelor of Nursing

Vertical Articulation

- Bachelor Degree (Honors)
- Master of Education (Biology)
- Master of Science (Biology)
- Master of Education (Curriculum and Instruction)
- Master of Education (Measurement and Evaluation)

Employment Pathways

- Biology Teacher
- Science Teacher
- College/University tutor
- Curriculum Developer
- Education officer/Inspector/Administrator
- Academic researcher (College/University)
- Assistant researchers in science
- Science Technician

QUALIFICATION AWARD AND CERTIFICATION

Qualification Award

To be awarded a Bachelor of Education (Biology) degree, a candidate must acquire a minimum of 508 credits.

Certification

Candidates meeting the prescribed requirements will be awarded the Bachelor of Education (Biology) and will be issued an official certificate and transcript.

REGIONAL AND INTERNATIONAL COMPARABILITY

The University of Fort Hare, South Africa, offers two degrees in science education. The different specializations including Biology Education are given under this general qualification. One at NQF level 7 (Bachelor of Education (Senior & Further Education and Training Phase) with a duration of 4 years and 480 credits (https://www.ufh.ac.za/degrees/BachelorEducationMathematicsandPhysicalScience). The degree is called physical sciences education. The Bachelor of education (Biology) compares well with the qualification at Fort Hare.

The University of Victoria in Canada (https://www.uvic.ca/education/areas-study/teacher-ed/index.php) offers a Bachelor of Education that they call Post Degree Professional Program (PDPP) post qualification. One has a choice of training to teach one or two science subjects. The program comes with two practicum sessions whose durations have not been stated.. The B Ed (Biology) qualification also offers two practicum sessions each of six weeks duration at levels two and three of study.

The University of Queensland, Australia (https://future-students.uq.edu.au/study/programs/bachelors-science-education-secondary-2479/computer-science-coscic2479) offers a 4 year full time equivalent for a Bachelor of Science/Education (Secondary) at NQF level 7.

Possible employment pathways could be in the following fields:

- School general science teacher
- High School Biology teacher
- Education officer
- Laboratory technician

REVIEW PERIOD

The qualification will be reviewed every five (5) years.

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