SECTION A:	QUALIFICATION DETAILS														
QUALIFICATION DEVELOPER (S)	University of Botswana														
TITLE	Master of Education (Science Education)												NCQF LEVEL	9	
FIELD	Education and Training		SUB-FIELD	Science Education									CREDIT VALUE	240	
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:

In the foreword to the Education and Training Sector Strategic Plan (ETSSP 2015 – 2020), the Botswana Minister of Education decried several issues that vexed the education sector in the country. One of these was what she called the "growing number of unemployed and under-employed youth". Qualifications mismatched with industry demands were seen as part of the problem and therefore entrepreneurial capabilities were to be cultivated. Mathematics, Science and Technology are seen as key pillars for the entrepreneurial capability of any country and form the basis for innovation and technological development of the country. Therefore, ETSSP's development of a modern, sustainable, knowledge-based economy ties in very well with the perceived need; that of producing graduate students who can fit in any environment, local, regional, and international school settings. National Development Plan (NDP 11) hints to a lot of progress having been made in terms of educational gains by the country, with some areas of concern such as the inequalities in educational outcomes, variable enrolments rates across the country and the relatively low quality in tertiary education. There is need therefore for institutions to be properly posed to address the shortfalls identified in NDP 11 by producing graduate students who will be knowledge generators as opposed to just consumers of knowledge generated elsewhere. They will have to possess skills such as resourcefulness, marketability and adaptability, innovative, and critical thinking, as well as having a positive disposition to collaboration as opposed to working in silos to meaningfully contribute to the knowledge-based economy.

The Science, Mathematics, Technology, and Engineering (STEM) disciplines are key to the economic development of any country. 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 …) speak to these areas of study. Graduate work in the areas would ascertain greater understanding of the disciplines and the methods to teach them at lower levels in school science. 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).

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 a view to influencing change.

PURPOSE:

Cultivation of research and innovation can best be done through graduate involvement in research in Universities and research centres. Institutions therefore should position themselves strategically for such times as these to tap into the new market demands through offering graduate qualifications that are responsive to national needs and demands. With the country moving in the research and innovation direction, and perhaps even in line with the Universities missions of advancing knowledge through excellence in research and its application, the departments will position themselves to be a regional hub for graduate work in Science Education through capacity building. Already this is bearing fruits with students from Lesotho, Namibia, just to mention a few, already accessing graduate work in the areas in the country.

Graduates of this qualification will be able to:

1. Demonstrate intellectual independence, critical thinking, and analytical skills in the development of well-rounded, coherent, and systematically developed evidenced based academic arguments.
2. Display competence in planning, conducting, and presenting results of an independent inquiry in Science Education.

3. Demonstrate the practical application of Science in society and exhibit the potential to use the information to inform their research work. In the process, demonstrate the influence Science has on innovation and technological developments which should inform research paradigms.
ENTRY REQUIREMENTS (including access and inclusion)
• NCQF Level 7 or equivalent • Access through Recognition of Prior Learning (RPL) or Credit Accumulation Transfer (CAT) is allowable through institutional policies in-line with national RPL and CAT policies.

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SECTION B	***QUALIFICATION SPECIFICATION***
GRADUATE PROFILE (LEARNING OUTCOMES)	***ASSESSMENT CRITERIA***
LO1: Demonstrate intellectual independence, critical thinking, and analytical skills in the development of science education academic arguments.	AC1.1: Relate knowledge, skills, and competences to science education contexts in conducting research. AC1.2: Apply critical analysis and reflection to demonstrate cognitive and technical skills in science education academic presentations.
LO2: Demonstrate the skills to critically analyse and evaluate data and theoretical positions in science education.	AC2.1: Differentiate among inferences, hypotheses, assumptions, and conclusions in interacting with empirical evidence. AC2.2: Assess data sets and results for asserted truths, expressed doubt, evidence for a claim and a justification for action or whether the statement given is a stated fact to better arrive at conclusions.
LO3: Contribute to systematic and discipline specific thinking about educational matters and issues in Science Education.	AC3.1: Assess theoretical positions and proffered solutions to educational problems for relevance in generating knowledge.
LO4: Demonstrate competence in planning, conducting and presenting results of an independent inquiry in Science Education.	AC4.1: Design and evaluate appropriate theoretical and methodological frameworks for studies in Science Education. AC4.2 Use appropriate research techniques to collect, organize, analyse, and critically evaluate data from primary and secondary sources. AC4.3 Demonstrate evidence for engagement with the wider field of relevant educational and research literature.

LO5: Demonstrate the practical application of science in society and exhibit the potential to use the information to inform their research work.	AC5.1 Demonstrate ability to manage educational contradictions and make general scientific and educational value commitments and judgements. AC5.2: Meaningfully interact and engage in debates with learning or professional groups in science education
LO6: Demonstrate the influence science has on innovation and technological developments which inform research paradigms.	AC6.1: Demonstrate the responsibility, self-reflexivity, and adaptability as an educational leader AC6.2: Analyze tensions and contradictions in response to the scientific and technological issues and use these to inform research results.

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SECTION C	***QUALIFICATION STRUCTURE***				
COMPONENT	***TITLE***	***Credits Per Relevant NCQF Level***			***Total (Per** Subject/ Course/ Module/ Units)*
		Level [8]	***Level [9]***	***Level [ ]***	
FUNDAMENTAL COMPONENT *Subjects/ Courses/ Modules/Units*	Integrated Foundations of Education		***9***		***15***
	Educational Research		***9***		***30***
	Advanced Curriculum Development, Implementation and Evaluation in Science Education		***9***		***15***
CORE COMPONENT *Subjects/Courses / Modules/Units*	Advanced Curriculum Development, Implementation and Evaluation in Science Education		***9***		***15***
	Research Seminar in Science Education		***9***		***15***
	Computer Applications in Mathematics and Science Education		***9***		***15***
	Statistical Models and Experimental Designs		***9***		***15***
ELECTIVE/ OPTIONAL COMPONENT *Subjects/Courses / Modules/Units*	**Electives set 1**				
	Dissertation		**9**		***120***
	Electives set 2 (Research Essay + two elective modules)				
	Research Essay		***9***		***90***

	Electives/optional components (Pick two modules)				***30***
	Research Seminar in Science Education II		***9***		***15***
	Emergent Issues in Science Education		***9***		***15***
	Development of Science Education in Botswana		***9***		***15***
	Science, Technology and Society		***9***		***15***

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SUMMARY OF CREDIT DISTRIBUTION FOR EACH COMPONENT PER NCQF LEVEL	
TOTAL CREDITS PER NCQF LEVEL	
NCQF Level	***Credit Value***
9	***240***
TOTAL CREDITS	***240***

Rules of Combination:

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

The qualification has choice of the research essay or the dissertation route.

- Research Essay Route: requires student to have accumulated 150 credits of taught courses and do 90 credits of research work.
- Dissertation Route: requires student to have accumulated 120 credits of taught courses and do 120 credits of research work.

To be awarded the qualification, the student must accumulate at least 240 credits composed of:

- 60 credits fundamental modules
- 60 credits core modules
- Electives (electives set 1)120 credits of research only or (electives set 2) 90 credits research and 30 credits taught two elective modules.

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ASSESSMENT ARRANGEMENTS

- There shall be formative and summative assessment with 50% - 50% contribution respectively.
- Assessors shall all be registered with BQA.

MODERATION ARRANGEMENTS

- There shall be provision for both internal and external moderation in accordance with institutional policies aligned with national policies.
- Moderators shall all be registered with BQA.

RECOGNITION OF PRIOR LEARNING

There is provision for award of this qualification through RPL in-line with institutional and national RPL policies.

CREDIT ACCUMULATION AND TRANSFER

There is provision for credit accumulation transfer in-line with institutional policy.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Horizontal Articulation

- Master of Science (in Biology, Chemistry or Physics)
- Master of Educational Technology
- Master of Education Degree in Curriculum and Instruction
- Master of Education Degree in Measurement and Evaluation

Vertical Articulation

- PhD in Science Education
- PhD in Measurement and Evaluation
- PhD in Curriculum Instruction

Employment Pathways

- Lecturer
- Teacher

- Curriculum designer
- Education officer
- Publication officer
- Researcher

QUALIFICATION AWARD AND CERTIFICATION

To be awarded *Master of Education (Science Education)*, a candidate is required to have achieved a minimum of 240 credits.

REGIONAL AND INTERNATIONAL COMPARABILITY

The *Master of Education (Science Education)* qualification is comparable to those on offer in the region and internationally. The qualification was compared to those on offer in three universities: one in the region (University of Pretoria, South Africa) and two internationally (University of Wisconsin-Madison, USA) and (Victoria University, Australia). The University of Pretoria (https://www.up.ac.za/yearbooks/2016/pdf/programme/02250442) calls its qualification Master of Science (Science Education) done over a 12 month period with a minimum requirement of 240 credits also. The degree at the University of Pretoria can thought of a double major in the cognate area and education and the dissertation could be in either of the two. This qualification, whilst it can allow for content studies, is predominantly education modules with a dissertation or research essay in an educational topic. The University of Queensland in Australia (https://my.uq.edu.au/programs-courses/requirements/program/5596/2022) offers what it calls Master of Educational studies over 18 months. There are different specialisations under this qualification. The credits are stated in terms of units and 32 units are required for this qualification. The credits equivalent is not stated. The University of Victoria in Canada (https://www.uvic.ca/education/curriculum/graduate/programs/mascss/index.php) offers a Master of Education (Curriculum and Instruction) with specialisation in Mathematics, Science or Educational Technology. The program requires 10.5 units of course work and 4.5 units of project work. This is completed over two years for full time equivalents.

There is a comparable emphasis in research in the three qualifications. The qualifications have similar models of assessment that are predominately based on continuous assessment using models such as term papers, projects and reports and research components pronounced as final work needed for qualification.

REVIEW PERIOD

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

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