BQA NCQF QUALIFICATION TEMPLATE

SECTION A:	QUALIFICATION DETAILS		
QUALIFICATION DEVELOPER (S)	Botswana International University of Science and Technology		
TITLE	Master of Science in Biology	**NCQF LEVEL**	9
STRANDS (where applicable)	1. N/A 2. 3. 4.		
FIELD	Natural, Mathematical and Life Sciences	**CREDIT VALUE**	240
SUB FIELD	Biological Sciences		

New Qualification	✓	Legacy Qualification		Renewal Qualification	
				Registration Code	N/A

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

As Botswana transforms its economy from a factor-driven economy that is dominated by the mining sector and agriculture to a knowledge-based economy, there should be a corresponding human resource revolution to align the human resource capital with the desired economy. Given that 40% of Botswana's population lives in rural areas (Statistics Botswana, 2014), where their livelihoods are inextricably linked to natural resources, advanced biological skills are one of the most needed skills to

improve value chain of natural products and hence impact positively on both the welfare of rural communities and the national economy. The National Human Resource Development Plan (NHRDP) to 2028, emphasizes the need for human capacity pool with advanced skills in science, including biological sciences. In fact, the Human Resource Development Council (HDRC), which is the implementing body for NHRDP, identified life sciences as a priority human development need and has recommended an increase in training at postgraduate level to boost research skill pool in the country. A Master of Science in Biology is an ideal qualification to contribute towards filling a gap research skills and advanced knowledge required across several sectors of the economy including the Science and technology, Agriculture and Ecotourism.

PURPOSE: (itemise exit level outcomes)

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

1. Demonstrate awareness of species conservation and conduct experiments ethically and professionally.

2. Communicate convincing and reasoned scientific arguments at a level and style appropriate to the audience and to report scientific findings in an oral and substantial written format.

3. Conduct research and tackling scientific problems in an autonomous way, with attention for originality, creativity and sustainability.

MINIMUM ENTRY REQUIREMENTS (including access and inclusion)

i. Bachelor's degree, NCQF Level 7 in biological or related sciences.

ii. There shall be access through Recognition of Prior Learning (RPL) and Credit Accumulation and Transfer (CAT) in line with relevant ETP policies.

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SECTION B	***QUALIFICATION SPECIFICATION***
GRADUATE PROFILE (LEARNING OUTCOMES)	***ASSESSMENT CRITERIA***

1. Apply advanced knowledge of biological sciences in solving practical challenges related to industry, medicine, biodiversity conservation.	1.1 Design and conduct experiments and test. 1.2 Design and carry out environmental impact assessments to identify changes caused by natural or human factors. 1.3 Examine living organisms using a variety of specialized equipment, instruments, technologies and techniques such as electron microscope, biotechnology, satellite imaging, polymerase chain reaction and computer modelling. 1.4 Gather animal, insect, microbial or plants specimens and data, and study their origin, development, chemical and physical form, structure composition, and life and reproductive processes. 1.5 Retrieve and synthesize biological information from different sources to generate solutions to local, regional and international life science problems.
2. Demonstrate advanced knowledge and awareness of bioethics when undertaking biological tasks.	2.1 Identify the research that requires ethical clearance, compile document and apply for ethical clearance 2.2 Handle biological specimens in an ethically and culturally sensitive manner and within the legislative framework while undertaking experiments in biology 2.3 . Avoid violation of intellectual property rights and show mutual respect to other scientists while undertaking research activities in biology
3. Disseminate biological information using advanced communication skills	3.1 Prepare scientific reports and publish papers detailing research and any new finding which are then made available to the scientific community in scientific journals. 3.2 Share biological information through oral presentations at conferences for scrutiny and further debates. 3.3 Provide advice to governments, organizations and business in areas such as conservation, management of biological resources, and the effects of climate change and pollution.
4. Apply advanced knowledge of biological sciences to generate new knowledge in the field	4.1 Undertake scientific experiments or other types of research investigation to produce new and impactful knowledge in biology and related fields. 4.2 Identify, classify, record and monitor specific groups of living organisms and maintain database. 4.3 Conduct research and develop new or improve methods related to biological sciences.

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SECTION C	***QUALIFICATION STRUCTURE***				
COMPONENT	***TITLE***	***Credits Per Relevant NCQF Level***			***Total Credits***
		Level [7]	***Level [8]***	***Level [9]***	
FUNDAMENTAL COMPONENT *Subjects/ Courses/ Modules/Units*					
CORE COMPONENT *Subjects/Courses/ Modules/Units*	MSc research project			168	168
	Organismal Physiology			12	12
	Biodiversity and Systematics			12	12
	Advanced Cell and Molecular Biology			12	12
	Research Design and Data Analysis			12	12

STRANDS/ SPECIALIZATION	*Subjects/ Courses/ Modules/Units*	***Credits Per Relevant NCQF Level***			***Total Credits***
		Level [7]	***Level [8]***	***Level [9]***	
1.					
2.					
Electives	Applied Plant Ecology			12	12
	Applied Animal Ecology			12	12
	Microbial Diversity and Ecology			12	12
	Infectious Diseases and Epidemiology			12	12
	Applied Entomology			12	12
	Wetlands and Fisheries Biology			12	12
	Systems Biology			12	12

SUMMARY OF CREDIT DISTRIBUTION FOR EACH COMPONENT PER NCQF LEVEL	
TOTAL CREDITS PER NCQF LEVEL	
NCQF Level	***Credit Value***
Core Level 9	216
Electives	24
TOTAL CREDITS	240

Rules of Combination: *(Please Indicate combinations for the different constituent components of the qualification)*

Core level 9 = : 216

Electives level 9 = 24 credits (Learners choose two modules)

Total = 240 credits

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ASSESSMENT ARRANGEMENTS

Formative

Formative assessment for this qualification will be constituted by module grades and drafting research proposals. Formative assessment will contribute 40% towards the final grade

Summative

Summative assessment will include final exam marks of the modules and thesis evaluation results

Summative assessment will contribute 60% towards the final grade

Assessment should be undertaken by suitably persons a doctoral degree in biology or related field.

MODERATION ARRANGEMENTS

There will be provision for internal and external moderation as a quality assurance. Moderation should be undertaken by suitably persons a doctoral degree in biology or related field.

RECOGNITION OF PRIOR LEARNING

There shall be provision for awards of credits through RPL in line with ETP policies.

CREDIT ACCUMULATION AND TRANSFER

There shall be provision for awards of credits through CAT in line with ETP policies.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Learning Pathways

Horizontal Articulation:

- Master of Philosophy in Biological Sciences
- Master of Science in Ecology
- Master of Science in Environmental sciences
- Master of Science in Microbiology

Vertical Articulation

- Doctor of Philosophy in Biological Sciences
- Doctor of Philosophy in Ecology
- Doctor of Philosophy in Environmental Science
- Doctor of Philosophy in Microbiology

Employment Pathways:

- Biologist
- Zoologist
- Botanist
- Ecologist
- Microbiologist
- Conversation scientist
- Biodiversity specialist

QUALIFICATION AWARD AND CERTIFICATION

The conditions set to be awarded Master of Science in Biology the candidate must:

A candidate must earn a minimum of 240 credits and fulfil the rules of combination stated in this document.

Candidates who have successfully met the requirements of this qualification will be offered a certificate. Candidates who have failed to meet all the requirements of this qualification will be offered a transcript to indicate their achievements.

SUMMARY OF REGIONAL AND INTERNATIONAL COMPARABILITY

This qualification was benchmarked regionally and internationally as follows:

1. Master of Science in Zoology: University Johannesburg, South Africa
2. Master of Science in Biology: KU Leuven, Belgium
3. Master of Science in Biology: Concordia University, Canada

Titles: The KU Leuven and Concordia university offers a Master of Science in Biology with a similar title to this qualification, while University Johannesburg (UJ) offers Master of Zoology. Biology deals with life and living organism. Even though the title of UJ is different from ours, it deals with life living

organism (animals exclusively), hence it is considered similar.

NQF Levels: This qualification is at NCQF Level 9, is similar to the South African benchmark at NQF Level 9. The Master of Science in Biology from Canada is at Ontario Qualifications Framework (OQF) Level 12, while the Belgian qualifications is at NLQF Level 7. The difference is attributed to the different NQF levels for the respective countries but have similar level descriptors.

Credit Value: The credit values differ according the NQF minimums for the respective countries, e.g. 120. This qualification has 240 credits to meet the NCQF requirements for Level 9 qualifications

Duration: All the qualifications are offered for two years, which is similar to this qualification.

Main Exit Level Outcomes: The main exit level outcomes of this qualification have been aligned to the benchmarks. These are (1) Work on an advanced scientific activity both autonomously and collaboratively. Furthermore, be able to ethically and professionally practice awareness on species conservation; (2) communicate a convincing and reasoned scientific argument at a level and style appropriate to the audience and report scientific findings in an oral and substantial written format; (3) conduct research and tackling scientific problems in an autonomous way, with attention for originality, creativity and sustainability.

Main Modules: All qualifications have taught modules and research component.

Assessment: All the qualifications have provision for formative and summative assessment.

Learning and Employment Pathways: All the qualifications have similar employment pathways such as Biologist, Zoologist, Botanist, Ecologist, Microbiologist, Conversation scientist, Biodiversity specialist.

Conclusion: The qualification compares well to the regional and internationally benchmarked qualifications. Therefore, this will accord the graduates of this qualification similar learning and employment opportunities regionally and internationally.

REVIEW PERIOD
5 years in line with the NCQF

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CODE (ID)			
REGISTRATION STATUS	**BQA DECISION NO.**	**REGISTRATION START DATE**	**REGISTRATION END DATE**
LAST DATE FOR ENROLMENT		**LAST DATE FOR ACHIEVEMENT**	