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SECTION A: QUALIFICATION DETAILS													
QUALIFICATION DEVELOPER (S)		Botho University											
TITLE	Bachelor of Science in Environmental Health										NCQF LEVEL	7	
FIELD	Health and Social Services		SUB-FIELD		Environmental Health				CREDIT VALUE	480			
New Qualification					✓		<i>Review of Existing Qualification</i>						
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: Botswana's healthcare system is modelled around primary healthcare which in turn is anchored on the principles of disease prevention and health promotion. Environmental health officers/ practitioners (also called public health inspectors) protect public health and promote quality of life by administering and enforcing relevant laws. They prevent disease and injury by ensuring the minimization of health and safety hazards, investigating incidents, and educating the community on health risks and maintaining conducive environments for the health of present and future generations. Environmental Health services in Botswana are primarily governed by the Public Health Act. In addition, the National Health Quality Standards for Environmental Health Services provides guidelines for													

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consistent interpretation and assessment of service standards. The same guidelines prescribe that at bare minimum Environmental Health services must take into consideration national legislation relating to water safety monitoring, food safety control, waste management, health surveillance of premises, surveillance and prevention of communicable diseases (excluding immunization), vector control, environmental pollution control, disposal of the dead and chemical safety. Environmental Health is therefore a critical and indispensable part of the successful implementation of a robust health care system in any country.

The ever-increasing disease burden from environmental exposure, which in turn is driven by factors such as climate change, globalization, and population growth continues to exert pressure on the global healthcare system. Due to their emphasis on impacting health at the population level, environmental health practitioners are a very critical component of any robust healthcare system. To achieve the WHO Millennium Development Goals (MDGs), all countries will require well trained healthcare professionals, including environmental health.

In Botswana, the government is the largest employer of health care workers and shortage of relevant and qualified health care workers remains a major obstacle to attainment of quality and accessible healthcare. While shortage of trained personnel is common among most healthcare worker categories in Botswana, environmental health is among the categories with most severe shortages (Nkomozana et al, 2014). Attainment of MDGs and Botswana's pillar 2: Human and social development will depend on the ability to establish and maintain a steady supply of well-educated and trained healthcare professionals such as environmental health officers. have been one of the factors found to predict economic success. Historically, environmental health workers in Botswana were trained to the Diploma level with very limited places for BSc Environmental Health within the country. This qualification will produce a graduate who is equipped to timely respond to twenty first century public health challenges.

Prioritization of occupations in demand is informed by national priorities duly outlined in Vision 2036, National Development Plan (NDP 11) and HRDC, 2019 – Priority Skills for Current and Future skills. The proposed qualification has been developed with this in mind and will therefore address this gap. A market survey was done to establish whether the qualification was viable. Responses to the market survey were generally positive and

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encouraging, thus establishing the viability of this qualification (*Appendix1 Market Need Analysis*). Furthermore, the qualification was reviewed by an industry expert (*Appendix: 2 Industry support letter*).

PURPOSE:

The purpose of this qualification is to produce graduates with the Knowledge, Skills, and Competences to:

- Control diseases, pests, and other injurious agents.
- Promote health, wellbeing, quality of life, human rights, equity, personal choice, privacy, and social responsibility.
- Develop plans to limit exposure to harmful products by implementing policies and programmes to minimize environmental risks to the public.
- provide avenues for continued personal and professional, as well as opportunities for fulfilling contribution to the health and safety of current and future generations.

ENTRY REQUIREMENTS (including access and inclusion)

Entry into this qualification is through any one of the following requirements:

- Certificate IV, NCQF level 4 (General Education or TVET).
- Applicants who do not meet the above criteria but possess relevant industry experience will be considered through Recognition of Prior Learning (RPL) and Credit Accumulation and Transfer (CAT).

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

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1: Control and manage the spread of disease.	1.1 Identify harmful environmental factors with potential to impact on the spread of diseases. 1.2 Develop and implement plans for reducing the spread of diseases. 1.3 Enforce legislative instruments to protect public health and the environment.
2: Demonstrate knowledge and understanding of principles, concepts, theories, practices, and processes in Environmental health.	2.1 Discuss key terms, processes, principles, theories, and concepts of environmental health. 2.2 Use appropriate techniques and relevant processes to solve environmental health problems faced by the community. 2.3 Explain the main areas and functions of Environmental health.
3: Observe and maintain ethical responsibility when dealing with medical data and/or patient confidentiality and issues of disclosure.	3.1 Adhere to standards and protocols of handling medical data management. 3.2 Apply professional ethics of healthcare. 3.3 Follow procedures and instructions for maintaining privacy/ confidentiality while using new information technology.
4: Conduct health and safety needs analysis	4.1 Identify and analyse Health and safety hazards. 4.2 Identify the needs associated with the health and safety Hazards. 4.2 Develop risk management matrices using risk management principles.
5: Contribute to the existing body of knowledge through research.	5.1 Search, analyse, and compare literature and data from environmental health research data. 5.2 Apply appropriate research methodologies in solving real world problems associated with the burden of diseases, their distribution, and relationships with the environment.

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	5.3 Interpret research project results in line with the learner's questions and/or hypothesis. 5.4 Write and submit an individual environmental health research report. 5.5 Communicate findings to different stakeholders.
6. Communicate with different stakeholders in the field of Environmental Health.	6.1 Use oral and written forms of communication. 6.2 Express views and opinions in clear and appropriate ways. 6.3 Reach consensus for cooperation in the face of different views. 6.4 Give feedback to colleagues and stakeholder during group and individual oral presentations. 6.5 Lead group activities through effective communication.

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SECTION C		QUALIFICATION STRUCTURE				
COMPONENT	TITLE		Credits Per Relevant NCQF Level			Total (Per Module)
		Level [5]	Level [6]	Level [7]	Level [8]	
FUNDAMENTAL COMPONENT Subjects/ Courses/ Modules/Units	Principles of Physics I	5	---	---	---	10
	Introduction to Health Professions	5	---	---	---	10
	General Biology I	5	---	---	---	10
	Computer and its Essentials I	5	---	---	---	10
	Introductory Mathematics	5	---	---	---	10
	Principles of Chemistry I	---	6	---	---	10
CORE COMPONENT Subjects/Courses/ Modules/Units	Elements of Statistics	---	6	---	---	10
	Academic writing for STEM	---	6	---	---	10
	Computer and its Essentials II	---	6	---	---	10
	Health Database Management System	---	6	---	---	20
	Microbiology in Health Sciences	---	6	---	---	10

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	Fundamentals of Public and Environmental Health	---	6	---	---	10
	Research Methods	---	6	---	---	10
	Operations Management and Quality Improvement	---	6	---	---	10
	Food Safety Management	---	6	---	---	10
	Environmental Management	---	6	---	---	10
	Port Health	---	6	---	---	10
	Meat Pathology and Inspection	---	6	---	---	10
	Occupational Health and Safety Management	---	6	---	---	10
	Topics in Human Genetics	---	---	7	---	10
	Compliance Inspection	---	---	7	---	10
	Medical Disaster Management	---	---	7	---	10
	Health and Safety Law	---	---	7	---	10
	Epidemiology of Infectious Disease	---	---	7	---	10
	Medical Statistics	---	---	7	---	20
	Global Public Health	---	---	7	---	10
	Built Environment	---	---	7	---	10

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	Solid and Liquid Waste Management	---	---	7	---	10
	Principles of Human Disease	---	---	7	---	10
	Environmental Toxicology	---	---	7	---	10
	Sampling, Analysis and Reporting	---	---	7	---	10
	Environmental Health risk Assessment	---	---	7	---	10
	Research Project I	---	---	7	---	10
	Professional Practice	---	---	7	---	40
	Community Health Education	---	---	7	---	10
	Case Studies	---	---	7	---	10
	Non-Communicable and Lifestyle Diseases	---	---	7	---	10
	Entrepreneurship & Innovation	---	---	---	8	20
	Research Project 2	---	---	---	8	20
ELECTIVE/ OPTIONAL COMPONENT <i>Subjects/Courses/ Modules/Units</i>	Elective 1 (Anyone from Elective 1)					
	Healthcare Project management	---	6	---	---	10
	Case Studies	---	6	---	---	10
	Elective 2 (Anyone from Elective 2)					

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	Operational Management for Health Practice	---	---	7	---	10
	Healthcare Quality Management	---	---	7	---	10

SUMMARY OF CREDIT DISTRIBUTION FOR EACH COMPONENT PER NCQF LEVEL

TOTAL CREDITS PER NCQF LEVEL

NCQF Level	Credit Value
5	50
6	160
7	230
8	40
TOTAL CREDITS	480

Rules of Combination:

- The credit combination for this qualification is 60 from fundamental component, 400 from core component and the remaining 20 (two courses) is from elective component. All credits add up to 480.

ASSESSMENT ARRANGEMENTS

The formative assessment contributes 40% towards the final grade.

The summative assessment contributes 60% towards the final grade.

MODERATION ARRANGEMENTS

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Both internal and external moderation will be done in-line with the Moderation policy of the Institution. The assessment and moderations shall be done by registered and accredited assessors and moderators.

RECOGNITION OF PRIOR LEARNING

Candidates may apply for recognition of prior learning whether such learning has been gained through formal study, through workplace learning, or through any other formal or informal means. Any candidate applying for recognition of prior learning (RPL), or Credit Accumulation and Transfer (CAT) will be expected to provide evidence of such learning that must be relevant, sufficient, valid, verifiable, and authentic. Provision of RPL for award of the qualification will be in line with the National RPL Policy.

CREDIT ACCUMULATION AND TRANSFER

A clear framework through which students can accumulate learning credits and transfer such credits toward appropriate qualifications helps to validate and recognize learning gained through formal and informal means, provides flexibility to students, and allows students to progress relatively seamlessly through their lifelong learning journey. Credit transfer Will be applied in line with National Credit Accumulation and Transfer (CAT) Policy.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Learning Pathway

Vertical:

Completion of a bachelor's degree meets the requirement for admission to a bachelor's degree Honours, Post-Graduate Diploma or Post-Graduate Certificate in fields such as:

- Environmental Health .
- Health Sciences.
- Healthcare Management.
- Community Health.

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Horizontal Pathway:

- Bachelor's Degree in Health Sciences.
- Bachelor's Degree in Healthcare Management.
- Bachelor's Degree in Community Health.

Employment Pathway

An Environmental Health degree is a steppingstone towards a number of high gratifying jobs including:

- Corporate Health and Safety Manager/ Director.
- Environmental Health Safety Specialist/ Practitioner.
- OHS Inspector.
- Food Safety Inspector.
- Port Health Inspector.
- Health and Safety Engineer.

QUALIFICATION AWARD AND CERTIFICATION

Upon successful attainment of 480 credits as specified in the rules of combination and credit distribution the learner will be awarded a '**Bachelor of Science in Environmental Health** and will be issued a certificate bearing the said qualification. This qualification does not have exit awards. Therefore, if the candidate does not meet the prescribed minimum standards of the qualification the learner will exit with a transcript.

REGIONAL AND INTERNATIONAL COMPARABILITY

REGIONAL:

- University of Johannesburg, South Africa: (Bachelor of Environmental Health).
- Tshwane University of Technology (TUT), South Africa: (Bachelor of Environmental Health).

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INTERNATIONAL

- Middlesex University, United Kingdom: Bachelor of Science (Environmental Health).
 - University of Sharjah, United Arab Emirates (Bachelor of Science in Environmental Health Sciences).
-
1. University of Johannesburg, South Africa, Bachelor of Environmental Health.
(<https://www.bachelorstudies.com/Bachelor/Environmental-Health/>)
 2. Tshwane University of Technology, South Africa, Bachelor of Environmental Health.
(<https://www.tut.ac.za/faculties/science/departments/environmental-health/about>)
 3. Middlesex University, United Kingdom.
<https://www.mdx.ac.uk/>
 4. Shatjah University, United Arab Emirates.
<https://www.sharjah.ac.ae/en/Pages/default.aspx>

Similarities

- Most of the core modules are similar, and place emphasis on similar scientific principles and concepts.
- The duration of qualifications is the same in three of the benchmark universities, the exception is Middlesex University, where the qualification duration is 3 years instead of 4.
- All qualifications include aspects of introductory communication and computer literacy skills.
- All qualifications emphasize research skills, professional ethics, and hands-on experience.
- Only Sharjah is similar in terms of inclusion of elective modules.
- Internship is compulsory in the proposed qualification, which is similar to Middlesex and Sharjah Universities.

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Differences:

- The name of the qualification differs slightly from those offered by University of Johannesburg, Tshwane University of Technology and Sharjah University.
- The number of total credits [University of Johannesburg (501); Tshwane University of Technology (499); Middlesex University (370); University of Sharjah (134).
- While this qualification has electives, qualification offered by University of Johannesburg, Tshwane University of Technology and Middlesex University do not.
- Internship module is compulsory in this qualification but optional at the University of Johannesburg, Tshwane University of Technology.

REVIEW PERIOD

5 Years