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| SECTION A: QUALIFICATION DETAILS   |   |                        |                           |                  |                          |                                     |                       |                                  |  |                          |                   |                  |  |                                     |
|--|---|------------------------|---------------------------|------------------|--------------------------|-------------------------------------|-----------------------|----------------------------------|--|--------------------------|-------------------|------------------|--|-------------------------------------|
| <b>QUALIFICATION DEVELOPER (S)</b>   |   | University of Botswana |                           |                  |                          |                                     |                       |                                  |  |                          |                   |                  |  |                                     |
| <b>TITLE</b>   | Master of Philosophy in Biomedical Sciences |                        |                           |                  |                          |                                     |                       |                                  |  |                          | <b>NCQF LEVEL</b> | 9                |  |                                     |
| <b>FIELD</b>   | Health and Social Services                  |                        |                           | <b>SUB-FIELD</b> |                          | Biomedical Sciences                 |                       |                                  |  | <b>CREDIT VALUE</b>      | 240               |                  |  |                                     |
| New Qualification  |   |                        |                           |                  |                          | <input checked="" type="checkbox"/> |                       | Review of Existing Qualification |  |                          |                   |                  |  |                                     |
| <b>SUB-FRAMEWORK</b>   |   | General Education      |                           |                  | <input type="checkbox"/> |                                     | TVET                  |                                  |  | <input type="checkbox"/> |                   | Higher Education |  | <input checked="" type="checkbox"/> |
| <b>QUALIFICATION TYPE</b>  | Certificate                                 | I                      | II                        | III              | IV                       | V                                   | Diploma               | Bachelor                         |  |                          |                   |                  |  |                                     |
|  | Bachelor Honours                            |                        | Post Graduate Certificate |                  |                          |                                     | Post Graduate Diploma |                                  |  |                          |                   |                  |  |                                     |
|  | Masters                                     |                        |                           |                  |                          | <input checked="" type="checkbox"/> |                       | Doctorate/ PhD                   |  |                          |                   |                  |  |                                     |
| RATIONALE AND PURPOSE OF THE QUALIFICATION   |   |                        |                           |                  |                          |                                     |                       |                                  |  |                          |                   |                  |  |                                     |
| <p><b>RATIONALE:</b></p> <p>The primary thrust of the proposed Master of Philosophy in Biomedical Sciences qualification is to develop competent biomedical researchers able to function in a variety of settings in the biomedical sciences field.</p> <p>In the document 'Vision 2036: Achieving Prosperity for All' the Presidential Task Team sets out 'a knowledge-based economy' with appropriate 'human capital' as key components of the first pillar of Sustainable Economic Development. In the same section it emphasises 'the quest to promote research and development and innovation.' In the second pillar 'Human and Social Development' a section on 'Health and Wellness' emphasises the need for 'health services of the highest standards attainable'; a section on 'Education and Skills Development' refers to 'technical and vocational skills as well as academic competencies' which stand in urgent need of development. The research and accompanying technical and academic competencies referred to in Vision 2036 are also in need of expansion in the field of the Biomedical Sciences, in order to underpin the quality of the health services and thereby the health of the population of Botswana. Healthcare and Biomedical</p> |   |                        |                           |                  |                          |                                     |                       |                                  |  |                          |                   |                  |  |                                     |

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research therefore plays a pivotal role in national development; this critical link is further supported by the National Health Policy of 2011 which emphasises the need to ‘promote research to improve health system performance’ (par.2.12.2).

The need for additional human resources in the health sector is acute. In the HRDC’s recent publication ‘Priority Skills and Employment Trends’ health sector occupations appear prominently in its ‘Forecasts for Botswana’s Top Occupations in Demand’ (Table 3). The success of qualifications with biomedical sciences offered as foundation courses (for example at the six Institutes of Health Sciences, the Botswana International University for Science and Technology, and the University of Botswana), depends on the availability of adequate numbers of suitably qualified biomedical scientists. There is a considerable body of evidence that recruitment and retention of staff with higher qualifications are current bottlenecks holding back the development of tertiary training institutions in the health sciences and health professions. Of their nature the desired higher qualifications at Masters and Doctoral level are research-based. Since there are a very few Botswana meeting the requirements for advertised positions, Botswana has heavily relied on expatriates to fill these positions. For instance, the six Institutes of Health Sciences have a total of only 13 lecturers in Microbiology, Anatomy and Physiology. Of the 13 lecturers, eight hold only a Bachelor’s degree, four hold a Master’s degree and were all trained outside Botswana. In the Botswana Education & Training Sector Strategic Plan (2015-2020) a stated priority is to ‘transform Institutes of Health Sciences (IHS) to produce quality health human resources’ – for which additional highly skilled local academics with at least Masters level qualifications (again research-based of their nature) will be required. In the Faculty of Medicine at the University of Botswana as of February 2018 there were only 65 clinicians and scientists, within a projected total establishment of 102 academic staff. Of the 65 academics 52 were in clinical departments and 13 in biomedical sciences, with only 22 and 9 citizen clinicians and biomedical scientists respectively. This indicates a further need for the country to develop its own research-based Masters qualification. It is therefore reasonable to expect that graduates with the proposed qualification will both help alleviate the chronic and dire staff recruitment and retention challenges set out above and contribute to building local capacity.

Annually in Botswana large number of students from the biological sciences, nursing, and medical laboratory science have been graduating at Bachelors or Honours level – since 2013 more than 1500 have graduated at the six Institutes of Health Sciences and the University of Botswana alone. These graduates currently have limited opportunities to pursue post-graduate research-based degrees in the Biomedical Sciences. The

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limitation is dire in clinical and biomedical sciences despite the high number of well-published PhD academics at tertiary institutions in Botswana who are ready to be supervisors for these higher degrees. As a related issue, research grants in Biomedical Sciences targeted for developing countries more frequently than not encourage capacity development, especially in research, at MPhil and PhD levels. Without the proposed qualification biomedical researchers in Botswana will not be able to benefit from such grants.

*Information sources: National Health Policy, Ministry of Health, Gaborone, 2011; Priority skills and employment trends, HRDC 2019; Botswana Vision 2026: Achieving Prosperity For All, 2016; Botswana Education & Training Sector Strategic Plan (ETSSP 2015-2020).*

#### **PURPOSE:**

The purpose of the qualification is to equip learners with advanced knowledge, skills and competences to:

- Conduct research on any topic related to the Biomedical Sciences.
- Communicate research findings effectively.
- Apply knowledge and understanding of biomedical sciences in the workplace.

#### **ENTRY REQUIREMENTS (including access and inclusion)**

- NCQF level 7 Bachelor of Science in Biomedical Sciences or Bachelor of Science in Biological sciences or equivalent.
- Recognition of Prior Learning and Credit Accumulation and Transfer are applicable as per the policies of individual Educational Training Providers.


### **SECTION B**

### **QUALIFICATION SPECIFICATION**

The prime purpose of this qualification is to develop mastery of the research process in the discipline in which it is based. It is research-based and requires critical engagement with research and disciplinary practices in the area of Biomedical Sciences, using an appropriate process of enquiry ethically.

#### **GRADUATE PROFILE (LEARNING OUTCOMES)**


#### **ASSESSMENT CRITERIA**

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| LO1. Conduct research on any topic related to the Biomedical Sciences | 1.1 Identify a suitable research topic<br>1.2 Design a comprehensive research protocol<br>1.3 Obtain ethical approval for the research<br>1.4 Collect the data required<br>1.5 Analyse the data collected                               |
| LO2. Communicate research findings effectively                        | 2.1 Compile a dissertation/ thesis<br>2.2 Present the research findings to local and international stakeholders<br>2.3 Publish the research findings in a peer-reviewed journal   |
| LO3. Apply understanding gained in the workplace                      | 3.1 Conduct further Biomedical Science research<br>3.2 Share knowledge gained with learners and colleagues<br>3.3 Contribute to management of health-related programmes<br>3.4 Contribute to the development of health-related policies |

| <b>SECTION C</b>  | <b>QUALIFICATION STRUCTURE</b> |              |                |
|---|--------------------------------|--------------|----------------|
| <b>COMPONENT</b>  | <b>TITLE</b>                   | <b>Level</b> | <b>Credits</b> |
| <b>CORE COMPONENT</b><br><i>Subjects/Courses/<br/>Modules/Units</i> | Research protocol              | 9            | 60             |
|   | Data collection                | 9            | 60             |
|   | Data analysis                  | 9            | 60             |
|   | Dissertation                   | 9            | 60             |

| <b>SUMMARY OF CREDIT DISTRIBUTION FOR EACH COMPONENT PER NCQF LEVEL</b> |                   |                     |
|---|-------------------|---------------------|
| <b>TOTAL CREDITS PER NCQF LEVEL</b>                                     |                   |                     |
| <b>Component</b>  | <b>NCQF Level</b> | <b>Credit Value</b> |
| <b>Core</b>   | 9                 | 240                 |
| <b>TOTAL CREDITS</b>  |                   | 240                 |

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### **Rules of Combination:**

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

- The minimum time during which study towards the award of the qualification can be completed is two (2) years if done full-time. If study is undertaken part-time a maximum of four (4) years is allowed.
- Each of the listed core courses (60 credits each) must be completed in sequence.

### **ASSESSMENT ARRANGEMENTS**

Formative assessment takes place through regular meetings and feedback from research supervisors or dissertation committees.

Summative assessment: the dissertation produced must be assessed as satisfactory by internal and external examiners, appointed according to the policies of the Educational Training Provider, and registered and accredited by BQA or any other recognised body.

### **MODERATION ARRANGEMENTS**

Rigorous moderation in accordance with the policies of the Educational Training Provider, internally by assessors registered and accredited by BQA, and externally by persons registered and accredited by any appropriate recognised body.

### **RECOGNITION OF PRIOR LEARNING (RPL)**

Candidates may submit evidence of Prior Learning and current competence or undergo appropriate forms of RPL assessment for the award of credits towards the qualification in accordance with the policies of the Educational Training Provider.


### **CREDIT ACCUMULATION AND TRANSFER**

Credit Accumulation and Transfer will be applied to any programme contributing to the award of this qualification, evaluated on a case-by-case basis by each Educational Training Provider according to its policies.

### **PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)**

Horizontal progression pathways:

- Master of Philosophy in Medical Sciences
- Master of Philosophy in Biological Sciences

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- Master of Education in Physical Education
- Master of Business Administration
- Master of Public Health

Vertical progression pathways:

- Doctor of Philosophy in Biomedical Sciences

Employment pathways:

- Researchers
- Academics and teachers
- Health-related policy developers
- Product developers
- Managers of health-related programmes

### **QUALIFICATION AWARD AND CERTIFICATION**

The qualification of Master of Philosophy in Biomedical Sciences may be awarded to candidates who have spent a minimum of 2 (two) years of study, have obtained a minimum of 240 credits, have adhered to the Rules of Combination and have produced a satisfactory dissertation.

### **REGIONAL AND INTERNATIONAL COMPARABILITY**

The qualification has been compared to two Masters level qualifications in the Biomedical Sciences:


- Regional: University of Cape Town, South Africa
- International: University of Cambridge, United Kingdom

Both of these qualifications are fully aligned with the proposed qualification, on the understanding that Educational Training Providers use different nomenclatures for describing Masters qualifications (e.g. Master of Science or Master of Philosophy). In both examples provided the core comparator is that the Masters level qualification is a research-based programme based in the Biological/ Biomedical Sciences.

### Summary of similarities and differences observed

#### **Similarities:**

- The proposed qualification compares well with both qualifications studied in the following respects:
  - The exit outcomes cover a similar scope and depth and are aligned to exit-level descriptors typical of this level and type of qualification

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- The qualifications are all research-based and require submission of a thesis/dissertation for examination
- Qualification rules and standards are similar
- All qualifications require students to go through skills and technique training.
- The proposed qualification differs from both qualifications studied in the following respects:

**Differences:**

- Qualification levels and credits differ for the following reasons:
  - Some preparatory courses at the University of Cape Town are not credit-bearing
  - The United Kingdom uses different systems to allocate levels and calculate credits.
- In the proposed programme and the one at the University of Cape Town assessment is based on the quality of the written dissertation only; the Cambridge University programme also includes an oral examination, based on the dissertation.

**REVIEW PERIOD**

The qualification will be reviewed within 5 years of being registered on the NCQF framework, and thereafter every 5 years.