SECTION A:	***QUALIFICATION DETAILS***
QUALIFICATION DEVELOPER	University pf Botswana

TITLE	Master of Philosophy in Physics	***NCQF LEVEL***	9

FIELD	Natural, Mathematical and Life sciences	**SUB-FIELD**	Physics	***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*										
	Master of Philosophy/MPhil	√	*Doctorate/ PhD*												

RATIONALE AND PURPOSE OF THE QUALIFICATION
The National Policy on Research, Science, Technology, and Innovation (RSTI) represents Botswana's commitment to diversify her economy, attain global competitiveness, and enhance the quality of life of Batswana. This is to be achieved through the development, adaptation and application of research, innovation, and technology to produce products and services using local resources. Research, innovation, and development will continue to be critical factors in creating and sustaining national competitive advantage and economic growth during NDP 11. Physics is the foundation in any science related research, whether in geosciences, theoretical, experimental, weather forecasting and space related research and hence the demand in physics graduates. One of the pillars of vision 2036 is that sustainable and optimal use of natural resources will have transformed our economy and uplifted our people's livelihoods. The use of science research (physics in particular) has the potential to innovate and create employment skilled, unskilled and semi-skilled segment of the population and thereby improve their quality of life. Physics through research has the capability of developing new technologies that can be utilized to protect the environment and minimize the severity of global warming and through science new frontiers in research can be developed.

The government of Botswana through the Ministry of Education and Skills Development (MoESD) has set out its priority to have improved sector wide planning leading to improved education sector performance over the next five years. The development of this five-year Education and Training Sector Strategic Plan (ETSSP: 2015-2020) will have far-reaching effects on the future education in Botswana. The strategies as outlined in the document will provide high quality education and providing a wide range and flexible learning opportunities within a lifelong learning framework. Fostering innovation and generating new knowledge and skills for the socio-economic and sustainable development of the nation can be achieved the research and education.

To improve economic and social conditions for the Nation while advancing itself as a distinctively African university with a regional and international outlook. The Master of Philosophy (Physics) qualification provide excellence in the delivery of learning to ensure society is provided with talented, creative, and confident graduates, advanced knowledge and understanding through excellence in research and its application, Improve economic and social development by high impact engagement with business, the professions, and civil society. Application of physics-dependent knowledge and technology is important to the development of a society through the application of research, technologies, innovation, and development, hence the need to have graduates in physics who could be absorbed by different scientific, engineering and related fields.

PURPOSE:

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

- Conduct research using different methodologies to analyse various types of data sets found in the field.
- Solve theoretical and experimental problems as globally competitive researchers.
- Distinguish between qualitative and quantitative research in physics.
- Apply acquired knowledge and skills to develop new theories, experiments and technology in physics related areas.
- Provide intellectual leadership in a professional and ethical manner in physics and related fields.

ENTRY REQUIREMENTS (including access and inclusion)
1. The applicant should have completed NCQF level 7 2. RPL according to University Policy

SECTION B	*QUALIFICATION SPECIFICATION*
GRADUATE PROFILE (LEARNING OUTCOMES)	***ASSESSMENT CRITERIA***
LO1: Communicate effectively in sharing scientific findings to the community.	1.1 Explain experimental and theoretical concepts by integrating physics and mathematical skills. 1.2 Demonstrate in writing an understanding of scientific principles and ethics. 1.3 Compile a detailed dissertation of the research showing understanding of scientific research ethics 1.4 Demonstrate an appropriate acquaintance with the literature 1.5 Prepare scientific manuscripts for presentation in conferences and publication in peer reviewed journals. 1.6 Write proposals to attract research funding for scientific research investigations.
LO2: Conduct research experiments and demonstrate understanding in relevant physics research areas.	2.1 Conduct experiments to gather and analyze data to draw reasonable recommendations. 2.2 Use computers, videos, and online resources to engage and reinforce understanding on various physics fields

	2.3 Apply acquired knowledge to undertake innovative research that addresses societal issues in industry and academia *2.4* Analyse qualitative and quantitative data in physics using computational and mathematical techniques. *2.5* Demonstrate advanced knowledge in experimental design and scientific data collection and analysis

SECTION C	***QUALIFICATION STRUCTURE***				
FUNDAMENTAL COMPONENT *Subjects/ Courses/ Modules/Units*	***TITLE***	***Credits Per Relevant NCQF Level***			***Total (Per** Subject/ Course/ Module/ Units)*
		Level [8]	***Level [9]***	***Level [10]***	
2 ***CORE COMPONENT*** *Subjects/Courses/ Modules/Units*	SUPERVISED RESEARCH AND DISSERTATION IN PHYSICS	***240***			***240***

SUMMARY OF CREDIT DISTRIBUTION FOR EACH COMPONENT PER NCQF LEVEL	
TOTAL CREDITS PER NCQF LEVEL	
NCQF Level	*Credit Value*
9	*Min 240*
TOTAL CREDITS	*240*
Rules of Combination: ***(Please Indicate combinations for the different constituent components of the qualification)***	
SUPERVISED RESEARCH AND DISSERTATION IN PHYSICS	

ASSESSMENT ARRANGEMENTS
Formative assessment contributes 50% and summative assessment contributes 50% towards the final grade.
MODERATION ARRANGEMENTS
Moderation to be done following university regulations and by BQA registered assessors and moderators
RECOGNITION OF PRIOR LEARNING (if applicable)
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 applicable university RPL policies.
PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)
Vertical progression: candidates may progress to PhD in theoretical and experimental physics at NCQF level 10 in the following research areas. PhD in experimental physics, • PhD instrumentation, • PhD in astrophysics, • PhD in environmental physics, • PhD in space physics, • PhD in material science • PhD in laser physics • PhD in agricultural science,

- PhD in earth sciences and other related fields

Horizontal progression: candidates may progress to:

- MSc in Physics (NCQF level 9),
- MSc in Radiation and health physics (NCQF level 9),
- MSc in applied geosciences (NCQF level 9).
- MSc in Information Technology (NCQF level 9),
- MSc in Agro-meteorology (NCQF level 9),
- MSc in Agricultural science (NCQF level 9),
- MSc in Instrumentation (NCQF level 9)
- MSc in Theoretical physics (NCQF level 9)
- MSc in Engineering (NCQF level 9)
- MSc in Astrophysics (NCQF level 9).

EMPLOYMENT OPPORTUNITIES FOR PROGRAMME GRADUATES IN BOTSWANA:

- Geophysicist
- seismologist,
- Higher education lecturer e.g. lecturing,
- Metallurgist,
- Nanotechnologist,
- Radiation protection practitioner,
- Research scientist (physical sciences),
- teacher,
- Meteorologist,
- Engineer (nuclear, software, laser, nanotechnology, telecommunications, optics),
- Astrophysicist
- Medicine practitioner,
- Consultants in Renewable energy,
- Agricultural engineer

QUALIFICATION AWARD AND CERTIFICATION

- Master of Philosophy (Physics) candidates meeting the prescribed requirements (minimum credits of 240 as per NCQF level 9) will be awarded the qualification in accordance with the qualification composition rules and applicable policies.

REGIONAL AND INTERNATIONAL COMPARABILITY

The Master of Philosophy in Physics is generally comparable in terms qualification credits, exit level outcomes, assessment criteria and employment pathways with the regional and international qualifications considered.

The qualification facilitates both the vertical and horizontal articulation in the academic progression in the area theoretical physics, experimental physics, instrumentation, astrophysics, environmental physics, space physics, material science and many other related fields. The MPhil (Physics) is bench marked with similar programmes offered by other Universities regionally and internationally. Regionally, University of Stellenbosch and University of the Western Cape in South Africa were considered and Internationally, University of Cambridge, University of West England and Newcastle University in United Kingdom were considered.

The notable similarities are that MPhil at University of Botswana (NCQF level 9) is a 2-year fulltime program: research only (3-year part-time) and offered as a 2-year (part-time) program at University of Cambridge with 240 credits, and University of Stellenbosch (with 240 credits). The difference is observed at Newcastle University (1-year program) and University of the Western Cape (with 120 credits).

REVIEW PERIOD

i) qualification will be reviewed every 5 years