SECTION A:	***QUALIFICATION DETAILS***															
QUALIFICATION DEVELOPER (S)	University of Botswana															
TITLE	Doctor of Philosophy in Physics												***NCQF LEVEL***		*10*	
STRANDS (where applicable)	*None*															
FIELD	Natural, mathematical and life sciences		***SUB-FIELD***		Physical Sciences								***CREDIT VALUE***		360	
New Qualification		✓	*Legacy 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:

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 the most advanced knowledge, skills and competences to:

i) Use physics to solve theoretical and experimental problems.

ii) Execute independent and original scientific research as globally competitive researchers.

iii) Develop new theories, experiments and technology in science related areas.

iv) Provide intellectual leadership in a professional and ethical manner in physics and related fields

MINIMUM ENTRY REQUIREMENTS (including access and inclusion)

- NCQF level 9 or equivalent.

Considerations for access through Recognition of Prior Learning and Credit Accumulation and Transfer will be done in accordance with the National Recognition of Prior Learning and Credit Accumulation and Transfer Policies

SECTION B	***QUALIFICATION SPECIFICATION***
GRADUATE PROFILE (LEARNING OUTCOMES)	***ASSESSMENT CRITERIA***
LO1: Identify and solve complex and original problems of physical science nature.	1.1 Integrate mathematical concepts and use appropriate knowledge to solve/explain physics theoretical concepts. 1.2 Apply mathematical and computational techniques relevant to the problem. 1.3 Use advanced laboratory skills to perform experimental investigations. 1.4 Effectively write mathematical solutions/proofs in a clear, logical and concise manner. 1.5 Formulate an appropriate hypothesis and carry out a complex experimental programme and theoretical models to analyse results obtained correctly. 1.6 Integrate experimental data with complex existing information, extrapolating it to the research problem. 1.7 Make logical, sound conclusions to resolve physics related problem.
LO2: Execute an original and advanced research project in Physics.	2.1 Design a project proposal for a most advanced topic in physics. 2.2 Conduct research using advanced techniques and skills of investigation and analysis of results.

LO3: Demonstrate high level of expertise in communicating and sharing scientific information.	3.1 Publish research results in peer reviewed journals. 3.2 present papers in conferences and collaborate with other international researchers.
LO 4: Use high technology scientific equipment and advanced scientific literature to acquire scientific data.	4.1 Use the high technology scientific equipment to accumulate scientific data. 4.2 Use experimental techniques effectively to obtain data. 4.3 Make use of advanced textbooks and scientific literature available to carry out literature review. 4.5 Relate everyday technology and science in general through reading scientific literature

SECTION C	***QUALIFICATION STRUCTURE***				
COMPONENT	***TITLE***	***Credits Per Relevant NCQF Level***			***Total Credits***
		Level [ ]	***Level [ ]***	***Level [10]***	
FUNDAMENTAL COMPONENT *Subjects/ Courses/ Modules/Units*	N/A			360	360
CORE COMPONENT *Subjects/Courses/ Modules/Units*	Supervised Research and Dissertation In Physics				
STRANDS/ SPECIALIZATION	*Subjects/ Courses/ Modules/Units*	***Credits Per Relevant NCQF Level***			***Total Credits***
		Level [ ]	***Level [ ]***	***Level [ ]***	
1.	N/A				
Electives	***N/A***				

SUMMARY OF CREDIT DISTRIBUTION FOR EACH COMPONENT PER NCQF LEVEL	
TOTAL CREDITS PER NCQF LEVEL	
NCQF Level	***Credit Value***
10	***360***
TOTAL CREDITS	***360***
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 100% to the grade for this qualification.
MODERATION ARRANGEMENTS
Moderation to be done following university regulations and by BQA registered assessors and moderators
RECOGNITION OF PRIOR LEARNING
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.
CREDIT ACCUMULATION AND TRANSFER
This qualification is designed to allow award through CAT, in accordance with Institutional and National CAT policy.
PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Horizontal progression: candidates may progress to:

1. PhD holders may progress in other specialized areas in science field at NCQF 10.

Employment Opportunities

- Geophysicist/field seismologist,
- Metallurgist,
- Nanotechnologist,
- Radiation protection practitioner,
- Research scientist (physical sciences),
- Meteorologist,
- Astronomist

QUALIFICATION AWARD AND CERTIFICATION

- Doctor of Philosophy (Physics) candidates meeting the prescribed requirements (minimum credits of 360 as per NCQF level 10) will be awarded the qualification in accordance with the qualification composition rules and applicable policies.

Candidates who have not met the minimum requirements but have accumulated credits from the qualification sought may be considered for appropriate exit awards in accordance with the university regulations.

SUMMARY OF REGIONAL AND INTERNATIONAL COMPARABILITY

The qualification 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 horizontal articulation in the academic progression in post-graduate research in theoretical physics, experimental physics, instrumentation, astrophysics, environmental physics, space physics, material science and many other related fields. Benchmarking has been done against qualifications offered by reputable entities within the region and beyond to appreciate what is typical of this level and type of qualification out there, in relation to graduate profiling, scope and depth of content, to ascertain regional and international comparability and articulation of the proposed qualification. The following international and regional Universities were used for benchmarking. University of Kent (UK), University of Cambridge (UK), University of Johannesburg (South Africa) and, University of Fort Hare (South Africa).

REVIEW PERIOD

Program will be reviewed every 5 years

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