SECTION A:	***QUALIFICATION DETAILS***																	
QUALIFICATION DEVELOPER (S)	Department of Computer Science, University of Botswana																	
TITLE	Doctor of Philosophy in Computer Information Systems														***NCQF LEVEL***		10	
FIELD	Information and Communication Technology		***SUB-FIELD***		Information Systems										***CREDIT VALUE***		360	
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*						
	Masters					*Doctorate/ PhD*						✓						

RATIONALE AND PURPOSE OF THE QUALIFICATION

RATIONALE:

With the advent of the Internet and the consequence of worldwide connectivity, computing systems and information systems hold the keys to National Development and long-term sustenance. Indeed, the VISION 2036 document calls for Sustainable Economic Development and Human and Social Development (Human Resource Development Council, 2015). Further, the Botswana Education and Training Sector Strategic Plan (ETSSP 2015-2022) also advocates for efforts to achieve a knowledge-based economy. The need to develop knowledge capital in computing systems and information systems compels the country to develop graduates with knowledge and skills in various types of computing systems and information systems. Furthermore, the Human Resource Development Council (2016) categorically states that there is a critical shortage of skilled personnel of Science and Technology Researcher in Information systems. The VISION 2036, National Development Plan (NDP 11), and long-term strategies of the different sectors of the economy (Human Resource Development Council, 2015) also confirm these findings.

There is a need, therefore, for strategic curriculum developments within Botswana to align with these developments. This is endorsed in the country's vision 2036 pillar 1 and 2 which aim at achieving sustainable economic and human social development in the country. In addition, the country has seen the need to move towards a knowledge-based economy to realize economic growth that is globally competitive. This includes improvements in the quality of education, which should hasten the country's move from a natural resource driven as articulated in the National Development Plan (NDP 11). In addition, the Human Resource Development Council (HRDC, 2016) calls for the need to have advanced computing knowledge and skills required for the country's development and employability of human capital.

The departmental national computing skills survey (CS Computing Skills Survey 2017) and HRDC report on Top Occupations in Demand (December 2016) also indicated that there is a need for graduates who can apply advanced knowledge in an intersection of technology, business, and strategy.

PURPOSE:

The purpose of this Master's qualification is to train students to be able to:

- Apply the theory and practice of information systems to provide solutions in business environments.
- Design and develop information systems.
- Address societal challenges through innovative investigation of the interaction between technology and society.
- Conduct research in information systems and publish articles in accredited journals and conferences.

ENTRY REQUIREMENTS (including access and inclusion)

For entry to the Ph.D. in Computer Information Systems, the following entry requirements shall apply.

i) Master's Degree in Information Systems (NCQF level 9) or related.

ii) Recognition of Prior Learning (RPL) and Credit Accumulation and Transfer (CAT) will be considered according to institutional policies and in line with national RPL and CAT policies.

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SECTION B	***QUALIFICATION SPECIFICATION***
GRADUATE PROFILE (LEARNING OUTCOMES)	***ASSESSMENT CRITERIA***
1. Apply advanced knowledge and skills in the design and development of Information systems.	1.1 Apply advanced knowledge and skills in the specification and design of complex information systems. 1.2 Select appropriate methods and frameworks for the development and deployment of information systems in an organizational context. 1.3 Evaluate the effectiveness of an information system solution in a particular organizational context. 1.4 Apply ethical standards, protocols, and practices relevant to the discipline.
2. Conduct independent, original, and scholarly research of international standard to develop new knowledge in Information systems.	2.1 Critique relevant theory and practice to articulate gaps in an area of interest in information systems. 2.2 Conduct in-depth literature search to select and justify methodological choices for achieving a particular research objective. 2.3 Explore various problem-solving techniques that effectively communicate strategic principles in the construction of computer-based solutions of varying complexity. 2.4 Develop a research proposal of an acceptable standard to address complex research problems. 2.5 Apply analytical, critical, and creative thinking skills to draw appropriate inferences and conclusions. 2.6 Develop proof of concept to demonstrate effectiveness of solution. 2.7 Publish articles in recognized journals or conferences.

	2.8 Present research findings in conferences and seminars.
3. Demonstrate innovative applications of information systems to address a specific business problem.	3.1 Show evidence of the ability explore new ideas, techniques, and tools. 3.2 Identify, analyse, and synthesize suitable approaches to solve real-life problems. 3.3 Choose a theoretical framework appropriate to a problem. 3.4 Select appropriate research methods and associated research design. 3.5 Explore alternative solutions to a problem and identify the most appropriate option through trade-off analysis. 3.6 Formulate methods to test and confirm the viability of the proposed solution

SECTION C	***QUALIFICATION STRUCTURE***				
COMPONENT	***TITLE***	***Credits Per Relevant NCQF Level***			***Total*** ***(Per** Subject/ Course/ Module/ Units)*
		Level [ ]	***Level [ ]***	***Level [10]***	
FUNDAMENTAL COMPONENT *Subjects/ Courses/ Modules/Units*	N/A	N/A	N/A	N/A	N/A
CORE COMPONENT	Supervised Research and Thesis in Computer Information System			360	360
ELECTIVE/ OPTIONAL COMPONENT *Subjects/Courses/ Modules/Units*	N/A	N/A	N/A	N/A	N/A

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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)***	
The qualification requires 360 credits of core courses. The total credit a learner must achieve is 360.	

ASSESSMENT ARRANGEMENTS

Assessment will consist of both formative and summative assessments and should be aligned with learning outcomes and sub-outcomes. Assessment will be carried out by registered and accredited assessors.

1. Formative assessment

Formative assessment or continuous assessment component of the thesis may include one or more of the following: seminar presentations, proposal defence, and research publications. Continuous assessment shall contribute 50% to the final grade of the thesis.

2. Summative assessment

Summative assessments are conducted in the form of oral examination (thesis defence). The oral examination is assessed by both external and internal examiners. Summative assessment shall contribute 50% to the final grade of the thesis.

MODERATION ARRANGEMENTS

In accordance with institutional policies and regulations, internal and external moderations are conducted by registered and accredited moderators.

1. Internal moderation requirements

Internal moderation is carried out by BQA accredited staff members in the department whose area of expertise is in line with the thesis topic to be moderated.

2. External moderation requirements

External moderation is carried out by BQA accredited moderators from other institutions recruited for this purpose.

RECOGNITION OF PRIOR LEARNING

Candidates may submit evidence of prior learning and current competence and/or undergo appropriate forms of RPL assessment for the award of credits towards the qualification in accordance with applicable institutional RPL policies and relevant national-level policy and legislative framework. Implementation of RPL shall also be consistent with requirements, if any, prescribed for the field or sub-field of study by relevant national, regional, or international professional bodies.

CREDIT ACCUMULATION AND TRANSFER

Credit accumulation and transfer will be done according to the institution's policy on credit accumulation and transfer in line with national RPL and CAT policies.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Learning Pathways

Horizontal Articulation

Learners in this qualification will have the following options for horizontal articulation:

- Ph.D. in Information Systems
- Ph. D. in Information Technology

Vertical Articulation

N/A

Employment Pathways

Graduates of this qualification will be able to take up the following jobs:

- Information Systems Researcher
- IS Manager
- IS Project Manager
- Information Systems Consultant
- Decision Support Manager
- Data Centre Managers
- Lecturer in information systems

QUALIFICATION AWARD AND CERTIFICATION

Qualification award

To be awarded Ph.D. in Computer Information Systems qualification, a learner must satisfy appropriate provisions of the institutional requirements. A learner is expected to complete a minimum of 360 credits with duration of 6 semesters. A candidate should attain a pass grade in the oral examination to be considered for the award of the qualification.

Certification

Successful candidates will be issued with a certificate of Doctor of Philosophy in Computer Information Systems authenticating the award.

REGIONAL AND INTERNATIONAL COMPARABILITY

The qualification has been compared with universities both regionally and internationally.

A comparison was made for the proposed qualification both regionally and internationally. At regional level, a comparison was made with the PhD in Information Systems offered by University of Cape Town, South Africa and PhD in Information Systems offered by the UNISA, South Africa. Internationally, a comparison was made with the PhD in Information Systems qualifications offered by New Jersey Institute of Technology (NJIT), USA and University of Geneva (UG), Switzerland.

Generally, the proposed qualification is similar to the regional and international qualifications studied for comparison in terms of the emphasis of the qualifications. While regional qualifications are similar in terms of duration and areas of research, international qualifications provide a variety of areas of research. However, the main objectives and learning outcomes are similar for all qualifications.

The proposed qualification generally compares well with the four qualifications studied in terms of aims and learning outcomes. The main difference is that the proposed qualification provides only a limited set of research areas in line with the available areas of specialization of academic staff who will be supervising PhD theses. Moreover, the proposed qualification does not require course work while international qualifications especially from USA require some course work.

REVIEW PERIOD

The qualification will be reviewed every five years.