QUALIFICATION SPECIFICATION						SECTION A
QUALIFICATION DEVELOPER	**University of Botswana**					
TITLE	**Master of Science (Computer Information Systems)**				**NCQF LEVEL**	**9**
FIELD	**Information and Communication Technology**		**SUB-FIELD**	**Information Systems**		
New qualification	√	Review of existing qualification				
SUB-FRAMEWORK	General Education		TVET		Higher Education	√
QUALIFICATION TYPE	Certificate		Diploma		Bachelor	
	Bachelor Honours		Master	√	Doctor	
CREDIT VALUE:					**240**	

RATIONALE AND PURPOSE OF THE QUALIFICATION

Rationale:

The department has gathered experience in offering the qualification for 14 academic years and useful observations and comments have been obtained from both staff and learners who have been involved in the qualification implementation. An External Reviewer conducted a comprehensive SWOT analysis of the qualification with specific recommendations for improvement. A Fulbright scholar visited the department for one academic year and made very useful observations about the qualification and some suggestions for improvement on its offering. The department has availed itself the computing curricula trend as documented in the ACM Model Curriculum and guidelines for graduate degree programs in Information System 2006 report [1]. Also availed was the Botswana Human Development Report 2005 (BHDR 2005) [2] which has clear implications for the computing technology human resources development. Further considered is the report of the Maitlamo project [3] spelling out ICT policy/strategy for Botswana and the ICT vision in 2016 [4], both of which have clear implications for computing education and training 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 economy to a knowledge-based one as articulated in the National Development Plan (NDP) 11 [5].

Graduates of this qualification qualify to work in occupations listed in the 2016 HRDC's top Occupations in Demand report [6], under the Information and Communication Technology sector. Skills acquired by

graduates of this qualification will contribute towards VISION 2036 [7] pillar 1 (Sustainable Economic Development) and pillar 2 (Human and Social Development) outcomes as the qualification develops human capital with the necessary specialized ICT skills and knowledge for local, regional, and international industries. The departmental national computing skills survey (CS Computing Skills Survey 2017) [8] and HRDC report on Top Occupations in Demand [6] also indicated that there is a need for graduates who can apply knowledge of information systems and computing to different sectors. Some of these are Systems analysts, Project Managers, ICT Consultants and Database Managers.

Purpose:

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

- Understand and address Information System (IS) issues.
- Design and manage IS.
- Identify and evaluate IS solutions and source alternatives.
- Secure data and infrastructure.
- Manage IS projects.
- Balance business, technology, and the human side of Information Systems.

ENTRY REQUIREMENTS (including access and inclusion)

To be admitted into Master of Science (Computer Information Systems), an applicant shall normally have:

- NCQF Level 7 (Bachelor's degree) or its equivalent.
- Entry through Recognition of Prior Learning in line with institutional and National policies where necessary.

QUALIFICATION SPECIFICATION	SECTION B
GRADUATE PROFILE (LEARNING OUTCOMES)	**ASSESSMENT CRITERIA**
3.1 Demonstrate knowledge and understanding of the discipline of Information Systems (IS) use in organizations.	3.1.1 Evaluate the state of IS applications in Organizations. 3.1.2 Compare and evaluate IS applications and their potential application in organizations. 3.1.3 Apply IS techniques to solve managerial and organizational problems. 3.1.4 Devise new ways to use computing technologies to gain strategic advantage in organizations.
3.2 Analyze large amounts of data in organizations using data mining and data warehousing techniques.	3.2.1 Apply acquired knowledge for understanding of data and selection of suitable methods for data analysis. 3.2.2 Apply advanced knowledge in data preprocessing, capturing and data quality assessment. 3.2.3 Apply and evaluate different data mining techniques to IS problems. 3.2.4 Describe the processes, architecture, and main components of data warehouses. 3.2.5 Design and build data warehouses.
3.3 Develop medium to large scale software systems.	3.3.1 Analyze and specify enterprise system requirements. 3.3.2 Select appropriate architectural designs, platforms, and components for a system. 3.3.3 Design an enterprise system with appropriate documentation. 3.3.4 Integrate system components. 3.3.5 Plan and manage IS deployment.

	3.3.6 Evaluate information systems performance using appropriate evaluation techniques.
3.4 Develop proficiency in basic IS project management skills.	3.4.1 Use tools and software techniques in Project Management. 3.4.2 Apply professional management skills to the design and management of an IS project. 3.4.3 Apply IS project management principles and support their use in the organizations.
3. 5 Manage IS organizations.	3.5.1 Formulate policies and strategies for IS in organizations. 3.5.2 Manage policies and strategies for IS in organizations. 3.5.3 Solve organization issues by making expert contribution to the conduct of business in a particular area of economic activity.
3.6 Conduct an independent research in the IS field.	3.6.1 Apply appropriate IS research methods for a research project. 3.6.2 Use the main concepts underlying the selection of research methods. 3.6.3 Undertake literature search and critical analysis of literature. 3.6.4 Engage in independent critical thinking, rational inquiry, and self-directed learning. 3.6.5 Produce an acceptable dissertation of a well-executed research project. 3.6.6 Appraise the ethical issues associated with research and knowledge production in the discipline.

QUALIFICATION STRUCTURE		SECTION C	
FUNDAMENTAL COMPONENT Subjects / Units / Modules /Courses	**Title**	**Level**	**Credits**
	Computing Research Methods.	**9**	**16**
	Project and Change Management.	**9**	**16**
	Computer Networking and Communications.	**9**	**16**
CORE COMPONENT Subjects / Units / Modules /Courses	Information Systems Engineering.	**9**	**16**
	Data Warehousing.	**9**	**16**
	Information Systems Policy and Strategy.	**9**	**16**
	Supervised Research and Dissertation.	**9**	**120**
ELECTIVE COMPONENT Subjects / Units / Modules /Courses	Topics in Computing.	**9**	**12**
	Business Finance.	**9**	**12**
	Strategic Management.	**9**	**12**
	Principles of Marketing	**9**	**12**
	Decision Support Systems.	**9**	**12**
	Information Retrieval.	**9**	**12**
	Public Policy and Administration.	**9**	**12**
	Managing Negotiations, Contracts and Conflicts.	**9**	**12**
	Other relevant masters level courses as may be deemed necessary		

Rules of combinations, Credit distribution (where applicable):

The qualification requires **48** credits of fundamental courses, **168** credits of core courses and **24** credits of elective courses. The total credit a learner must achieve is **240**.

MODERATION ARRANGEMENTS

ASSESSMENT

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

1. **Formative assessment**
   The Formative assessment shall contribute 60% of the final grade.

2. **Summative assessment**
   Summative assessment shall contribute 40% of the final grade.

MODERATION

In accordance with the university policies and regulations, internal and external moderations shall be conducted by BQA registered and accredited moderators.

RECOGNITION OF PRIOR LEARNING (if applicable)

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 university 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.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Horizontal Articulation

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

- MSc Software Engineering
- MSc Computer Science
- MSc Data Science

Vertical Articulation

Graduates of this qualification will have the following options for postgraduate education:

- PhD Computer Information Systems
- PhD Information Technology

EMPLOYMENT PATHWAYS

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

- Systems analysts
- Project Manager
- ICT Consultants
- Database Manager
- Business Analyst

QUALIFICATION AWARD AND CERTIFICATION

1. Minimum standards of achievement for the award of the qualification

To be awarded **Master of Science (Computer Information Systems)**, a learner must meet the minimum requirement for credits from the fundamental, core, and elective courses, and pass the MSc Dissertation examination.

Master of Science (Computer Information Systems) requires candidate to have passed 12 credits of fundamental courses, 168 credits of core courses and 60 credits of elective courses. The total credit a learner must achieve is 240.

2. Certification

Candidates meeting prescribed requirements will be awarded the qualification **Master of Science (Computer Information Systems)** in accordance with standards prescribed for the award of the qualification and applicable policies of the university.

REGIONAL AND INTERNATIONAL COMPARABILITY

This qualification has been benchmarked with the following:

Regionally:
This qualification was compared to similar ones in two universities namely:

- University of Cape Town, South Africa: Master of Commerce Information Systems.
- Makerere University, Kampala, Uganda: Master of Science in Information Systems.

Internationally:
The qualification was compared to similar ones at:

- The Paul and Virginia Engler College of Business, West Texas A&M University, USA: Master of Science in Computer Information.
- The University of Portsmouth, United Kingdom: Msc Information Systems.

Summary

The qualification generally compares well with those using the MSIS 2016 model curriculum.

Similarities

- Similar in terms of the core areas of Information systems covered.

- Duration similar (2 years).
- exit outcomes cover similar scope and depth and are aligned to exit-level descriptors typical of this level and type of qualification.

Differences

- Master of Science (Computer Information Systems) is very broad and is applied in the varied sectors differently.
- Some courses covered are different.
- Differ in credit value (Makerere University, Kampala, Uganda **156**; University of Cape Town, South Africa **180**; The University of Portsmouth, United Kingdom **180**; The Paul and Virginia Engler College of Business, West Texas A&M University, USA **36**).

REVIEW PERIOD

5 years