QUALIFICATION SPECIFICATION							SECTION A
QUALIFICATION DEVELOPER	**BOTHO UNIVERSITY**						
TITLE	**Master of Science in Information Systems Management**				**NCQF LEVEL**	**9**	
FIELD	**Information and Communication Technology**		**SUB-FIELD**	**Information Technology**			
New qualification	X	Review of existing qualification					
SUB-FRAMEWORK	General Education		TVET		**Higher Education**	X	
QUALIFICATION TYPE	Certificate		Diploma		Bachelor		
	Bachelor Honours		**Master**	X	Doctor		
CREDIT VALUE: 240							

RATIONALE AND PURPOSE OF THE QUALIFICATION

Rationale

The Government of Botswana developed a National Information and Communications Technology (ICT) Policy dubbed **Maitlamo Policy (2004)** that was in line with other government initiatives and assist in achieving Vision 2036 which envisioned that the National ICT Policy would position Botswana for sustained growth in the digital age by serving as a key catalyst in achieving social, economic, political, and cultural transformation within Botswana.

Development of human capital is essential in achieving the VISION 2036 pillars, mainly Pillar1: Sustainable Economic Development and Pillar 2: Human and Social Development. These two pillars emphasize transformation of Botswana's economy to a knowledge-based economy, producing globally competitive human resources. They represent key strategies for driving economic growth and diversification. Further, one of the NDP 11 goals states the need to provide an adequate supply of qualified, productive, and competitive human resources. It is to this effect that the MSc in Information Systems Management qualification is being developed: to achieve the vision by equipping the learners with the knowledge, skills and competencies in-line with the creation of a knowledge-based economy and sustainable economic growth in Botswana.

Furthermore, according to HRDC Priority Skills 2019 (Current & Future), the area of Information systems management is one of the priority skills that are in demand (See Future Jobs: Table 1: Information Technology Services, Information Security Analysts & Cyber Security). Prioritization of occupations in demand is informed by national priorities as outlined in the VISION 2036, National Development Plan-11 and long-term strategies of the

different sectors of the economy. This qualification was therefore developed in order to contribute human resources to fulfill the demand gap as per the HRDC Priority Skills 2019 report.

Botswana needs qualified and certified information technology professionals to help drive the nation on its mission of adequate human resources that the country needs to realize a knowledge-based economy as shown in the discussion above. It is against this background that this qualification has been developed to address the urgent need for adequately trained manpower to manage the area of Information Systems Management in various sectors of the economy. This qualification is a direct response to the increasing demand for highly effective information technology managers. The qualification aims to impart the knowledge, skills, and competencies required to produce valued information technology managers who effectively combine advanced technical expertise with strong management skills. As Botswana aspires to be a knowledge-based society, the issue of making sure that information technology professionals are trained in the principles and practice of Information Systems management comes to play. There is a need for a master's degree in Information Systems Management to help equip information systems management professionals with knowledge, skills, and competences to enable them to understand how technological innovations can be used to achieve strategic goals.

This qualification presents a unique opportunity in the context of Botswana and the region, because while there are master's degrees being offered by some universities in the area of systems and data management locally and regionally; the MSc in Information Systems Management is a new and unique qualification in the country. The qualification, therefore, can be studied by national, regional, and international entrants; and hence it will benefit not only Batswana but other countries in the region, continent, and the world over.

In addition, a Market need analysis was conducted with a view to sample stakeholders' perceptions and opinions regarding the market demand for MSc in Information Systems Management, skills requirement for the qualification, market demand for graduates, and sufficiency of the qualification. The study was undertaken in three sample locations in Botswana namely Gaborone, Francistown, and Maun. This study adapted both phenomenological (qualitative) and positivistic (quantitative) philosophies of data collection - namely desk research, telephonic interviews, face-to-face interviews, and In-depth Interviews (IDIs) among key stakeholders.

The report therefore presents the findings based on primary and secondary data collected from internal and external stakeholders. Most stakeholders namely employers (51.1%), alumni (91.7%), current (60.9%) and prospective (66.0%) students' overall ratings on the demand for MSc in Information Systems Management qualification were mainly on the upper spectrum of the scale, implying that the qualification's market demand is high.

Purpose:

Information technology specialists need to make complex decisions associated with the identification and evaluation of technologies, developing new or improved products and processes, and integrating technology with other business processes, and to manage change required by technology implementation.

The purpose of the MSc in Information Systems Management qualification is to produce graduates with effective skills and understanding that is essential to equip graduates from computing, computing in business and related disciplines, with the advanced level skills to analyse, model, design, evaluate and manage information systems successfully within an organisation. This qualification is needed to broaden information Systems management graduates' knowledge, skills, and competences that are critical to make informed decisions and disseminate data about information systems acquisition, exploitation, and implementation at organizational level.

The graduates of this qualification will be able to:

- Demonstrate advanced skills and a critical understanding of the technologies and methodologies required in information systems management.
- Develop appropriate design choices based on information system, data, and business process needs of an organization.
- Design appropriate information system structures in response to application needs, organizational environment, and technical ecology.
- Critically assess prevailing practices and develop innovative and original solutions to information systems management problems within an organization.
- Use and apply current technical concepts and practices in the core information technologies of big data, information security, system development and information technology management.
- Perform jobs as an information technology specialist / manager in a wide range of industry and business environments.
- Communicate and work effectively with peers in a variety of tasks, demonstrating appropriate levels of independence and responsibility within an organisation.

ENTRY REQUIREMENTS (including access and inclusion)
Entry into this qualification is through any one of the following requirements: • The minimum admission requirement is a bachelor's degree Honors in Computing/ Computer Science / Information Technology or any computer related field. • A Post-Graduate Diploma (NCQF level 8) in the field of study (Computing) may also meet admission requirements provided that at least 20 credits at level 8 have been allocated to research methodology within or additional to the qualification. • Applicants that do not meet the above criteria but possess relevant industry experience will be considered through recognition of prior learning (RPL).

QUALIFICATION SPECIFICATION	SECTION B
GRADUATE PROFILE (LEARNING OUTCOMES) **Upon completion of this qualification, learner will be able to:**	**ASSESSMENT CRITERIA**
1. Design appropriate information system structures in response to application needs, organizational environment, and technical ecology.	1.1. Demonstrate understanding of information systems requirements through case studies. 1.2. Appraise a range of information systems concepts, tools, and techniques. 1.3. Apply a range of information systems concepts, tools and techniques to the solution of complex information system problems. 1.4. Determine and apply appropriate project management approaches within complex information systems environments. 1.5. Evaluate information systems against a range of criteria.
2. Develop appropriate design choices based on information system, data, and business process needs.	2.1. Analyze the information system design structure for business application needs. 2.2. Analyze complex problems systematically and implement effective solutions 2.3. Evaluate business processes through analysis, design, and optimization in response to organizational needs. 2.4. Execute challenging and substantial information systems project by application of appropriate research methods.

	2.5. Develop information system artefacts using appropriate programming paradigms. 2.6. Develop and test information systems solutions to support business services or functions.
3. Develop sound evaluation practices to select appropriately among competing technologies and technical approaches.	3.1. Evaluate tools and techniques for the effective analysis and design of information systems solutions. 3.2. Identify and recommend appropriate technologies from a range of options available. 3.3. Make informed decisions on the appropriateness of tools and techniques for a given task. 3.4. Apply techniques for the evaluation, planning and management of information systems solutions.
4. Use and apply current technical concepts and practices in the core information technologies of big data, information security, system development and information technology management.	4.1. Solve complex information systems management problem using relevant practices and methods. 4.2. Demonstrate advanced problem-solving skills and techniques to general and specialized issues within the domain. 4.3. Apply practical skills in critical analysis evaluation and synthesis in consideration of the range of theories, concepts, and techniques in use within the domain of information systems management.
5. Apply social, legal, ethical, and professional issues in business and technical decision making.	5.1. Demonstrate how the social, economic, political, technological, and ecological dimensions of internal and external environments create a moral and social context for business decision making. 5.2. Understand the legal and social responsibilities of business toward their members, their customers, and the natural environment. 5.3. Apply personal values and ethical principles as a basis for identifying, analyzing, and managing ethical issues related to a problem in the discipline. 5.4. Demonstrate professional behavior in the academic environment.

6. Communicate new ideas and solutions within the field of Information Systems Management.	6.1. Communicate effectively both verbally and in writing about research content and its disciplines. 6.2. Critically review technologies relating to information systems management to support original and creative solutions. 6.3. Apply theories, concepts, and techniques in use within the domain of information systems management to suggest solutions to contemporary problems.
7. Work independently as well as a member or leader in diverse teams, and in multidisciplinary settings; and critically evaluate individual as well as other's work.	7.1. Demonstrate advanced negotiation and leadership skills. 7.2. Coordinate and execute tasks independently and within groups. 7.3. Demonstrate the deep understanding of leadership principles and practices in Information Systems Management. 7.4. Illustrate the characteristics and approaches inherent to successful leadership of Information Systems Management teams. 7.5. Demonstrate the ability to lead teams to achieve business objectives through the effective use of information technologies. 7.6. Critically reflect on own work and that of colleagues.

QUALIFICATION STRUCTURE **SECTION C**

	Title	Level	Credits
FUNDAMENTAL COMPONENT Subjects / Units / Modules /Courses	N/A		
	N/A		
CORE COMPONENT Subjects / Units / Modules /Courses	Big Data Management	9	20
	System Development management and Governance	9	20
	Information Security Management	9	20
	ICT Project Management	9	20
	Principles of Information Technology Management	9	20
	Management Information Systems	9	20
	Research Project 1: Proposal Writing	9	20
	Research Project 2: Dissertation	9	60
ELECTIVE COMPONENT Subjects / Units / Modules /Courses	Infrastructure Management	9	20
	ICT strategic management	9	20
	Content Management Systems	9	20
	Data Analytics	9	20

Rules of combinations, Credit distribution (where applicable):			

- To successfully complete the qualification the learner must complete all the 240 credits and should have successfully defended the proposal and final dissertation (Viva Voce).
- The credit combination for this qualification is 200 credits from core components and 40 credits from elective components

Credit Distribution:

Level and Credits	Compulsory	Elective
Level 9 Credits – 240	200	40
Total Credits: 240	200	40

ASSESSMNET AND MODERATION ARRANGEMENTS

This qualification is assessed and moderated as follows:

Integrated Assessment:

Because assessment practices must be open, transparent, fair, valid, reliable and ensure that no learner is disadvantaged in any way whatsoever, an integrated assessment approach is incorporated into the qualification. Both formative and summative assessment processes are monitored during the qualification and to determine competence at the end of the qualification.

Summative assessment:

Integrated assessment, focusing on the achievement of the exit-level outcomes, will be done by means of a written examination (of at least 2 - 3 hours) at the end of every module (per module).

Project: Students need to do a project and submit their project work at the end of the qualification.

Formative assessment:

Learners are continuously assessed through:

- Practical tests
- Class assignments
- Presentations
- Informal class tests
- Formal modular tests

Pass requirements:

A learner passes a module if he/she obtains a final mark of 50% or more in the module. The final mark is constituted of formative assessments (50%) and the summative assessment (50%). A learner qualifies for the MSc in Information Systems Management on NCQF level 9 when he/she passed all required modules individually. The final mark for the qualification is calculated by averaging the marks obtained in the various modules. The student should complete 240 credits to complete the qualification.

Moderation:

Moderation of assessments focuses on:

a) Ensuring the assessment is aligned to the module objectives and the learning outcomes.
b) Ensuring assessment is consistent on all levels within the institution and does not show any bias or academic disregard and that it is immune to all forms of prejudice.
c) Ensuring the level of assessment appropriately matches to students' level of study. This ensures that the assessments remain viable, relevant and provide an accurate judgement of a student's achievements and level of knowledge.
d) Maintaining consistency in the marking process

Pre-assessment Moderation:

This moderation is carried before assessment tasks are given to students. All submitted sets of question papers and marking keys are shared with the moderators. Each assessment pack should be moderated by two Moderators where possible. The question paper moderation report should be filled in for each question paper. Moderator report will be shared with question paper setter so that moderator feedback will be taken into account when finalizing the question paper.

Post-assessment moderation or moderation of marking:

Moderation of completed assessment tasks is categorized as post-assessment moderation. It is carried out after assessment tasks have been marked. The set of answer scripts and marking keys are shared with the moderators. At

least 10% of the answer scripts in a module should be moderated during post assessment moderation. Both internal and external moderation in line with moderation policy of the intuition.

Both internal and external moderation will be done in-line with the Moderation policy of the Institution.

Internal Moderators who are within the ETP are BQA accredited moderators.

External moderators are from both the industry and other accredited Education and Training Providers (Local and international experts).

RECOGNITION OF PRIOR LEARNING (if applicable)

A clear framework through which students can accumulate learning credits and transfer such credits toward appropriate qualifications helps to validate and recognize learning gained through formal and informal means, provides flexibility to students, and allows students to progress relatively seamlessly through their lifelong learning journey.

Candidates may apply for recognition of prior learning whether such learning has been gained through formal study, through workplace learning, or through any other formal or informal means. Any candidate applying for recognition of prior learning (RPL) will be expected to provide evidence of such learning that must be relevant, sufficient, valid, verifiable, and authentic. In addition, the candidate may be interviewed by a member of staff or have to take a formal test, which may include a live demonstration of skills and competencies, to assess competence.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Learning Pathway:

Vertical

A Master of Science in Information Systems Management graduate can continue to pursue a Doctoral in Computing/Computer science/Information Technology and any computer related areas.

Horizonal

A Master of Science in Information Systems Management graduate can do the following qualifications:

- MSc in Computer Science
- MSc in Network Security
- MSc in Information Technology

Employment Pathway:

As specified in HRDC, Priority Skills (Current & Future), March 2019 the following occupations are available:

- Application Analyst
- Cyber Security Analyst
- Data Analyst
- Data Scientist
- Information Systems Manager
- IT Consultant
- System Analyst
- Lecturers

QUALIFICATION AWARD AND CERTIFICATION

The learner will be awarded '**Master of Science in Information Systems Management '**after attaining 240 credit value as specified in the rules of combination and credit distribution.

- To successfully complete the qualification the learner must complete all the 240 credits and should have successfully defended the proposal and final dissertation (Viva Voce).
- The credit combination for this qualification is 200 credits from core components and 40 credits from elective components

This qualification does not have exit awards. Therefore, if the candidate does not meet the prescribed minimum standards of the qualification, the leaner will exit with a transcript.

REGIONAL AND INTERNATIONAL COMPARABILITY

This qualification was compared with various universities running similar qualifications. The following universities and their qualifications were taken for the comparison:

Local: This qualification is not offered locally.

Regional: This qualification is not offered in SADC region.

International:

- Master of Information Technology Management – University of Nairobi (Kenya)
- MSc Information Systems Management – University of Greenwich (UK)
- Master of Science - Computer System Management – Heriot-Watt University-UK.

University of Nairobi (UN) Kenya:

University of Nairobi, Kenya	Proposed Qualification
Research Methodology ICT Project Management Product design and Entrepreneurship Principles and Practice of Management Financial Management ICT Strategic Management ICT Procurement Practice Electronic Commerce Cloud Computing and IT outsourcing Information Systems Security and Audit Project	Big Data Management System Development Management and Governance Information Security Management ICT Project Management Principles of Information Technology Management Management Information Systems Research Project 1: Proposal Writing Research Project 2: Dissertation Infrastructure Management ICT strategic management Content Management Systems Data Analytics
Credits: 240	240
Duration: 2years	2 years

Both qualifications offer research modules prior to master's thesis. The research thesis has more credits than other modules in both the qualifications.

The differences between this qualification and University of Nairobi are:

- The credit systems and assessment are different.
- University of Nairobi is conducting seven modules without semester pattern in a year, while this qualification has modules of 60 credits per semester.
- The UN's qualification is divided in such a way that most computing courses and the management course are done in first Year.
- The UN's qualification is geared towards more managerial skills with less technical exposure while this qualification provides more modules for technical expertise.
- This qualification concentrates on systems and information modelling while Management modules compliment the University of Nairobi.

- This qualification focuses on real life challenges found in the IT field as well as designed towards meeting the new technology trends. This qualification provides the graduates for managing and executing in IT as well as providing research.

Master of Science - Computer System Management – Heriot-Watt University-UK.

Heriot-Watt University-UK	Proposed Qualification
Computer Network Security Database and Information Systems Project Management Research Methods and Project Planning Masters project and dissertation Advanced Network Security Advanced Software Engineering Big Data Management Data Communications and Networking Industrial Programming Information Systems Methodologies Network Applications Software Engineering Foundations Project	Big Data Management System Development Management and Governance Information Security Management ICT Project Management Principles of Information Technology Management Management Information Systems Research Project 1: Proposal Writing Research Project 2: Dissertation Infrastructure Management ICT strategic management Content Management Systems Data Analytics
Credits: 180	240
Duration: 1 year in Full Time, 2 years in Part Time	2 years

Both the qualifications offer research module prior to master's thesis and the research module is a prerequisite for the master's thesis.

The differences between this qualification and Heriot-Watt University are:

- The credit systems and assessment are different.
- Assessment of taught phase is through a variety of methods including coursework and / or examination while in this qualification assessment is based on In-Course Assessment.
- Dissertation consists of two stages; a poster and demonstration-based in Heriot-Watt University's qualification, whereas dissertation is documented and presented in this qualification.

M.Sc Information Systems Management – University of Greenwich (UK)

University of Greenwich-UK	Proposed Qualification
Systems Modelling Systems Development Management and Governance	Big Data Management System Development Management and Governance

Software Tools and Techniques Strategic IT Essential Professional and Academic Skills for master's Students MSc Project User Experience Design Software Tools and Techniques Managing IT Security and Risk Web and Intranet Content Management User Centered Web Engineering Audit and Security Organizational Awareness and Outsourcing	Information Security Management ICT Project Management Principles of Information Technology Management Management Information Systems Research Project 1: Proposal Writing Research Project 2: Dissertation Infrastructure Management ICT strategic management Content Management Systems Data Analytics
Credits: 180	240
Duration: 1 year in Full Time, 2 years in Part Time	2 years

The credit system is similar in both the qualifications; the dissertation work assigned consists of 60 credits and other modules as 20 credits. Project management is critical in all project activities, thus is provided as a core module to help managers to handle project work effectively.

The differences between this qualification and University of Greenwich are:

- The duration for Greenwich is only one year for full time and two year for part-time learners whereas for this qualification it is of 2 year for fulltime.
- Greenwich is more on business based whereas this qualification is more on computer-end management based**.**
- University of Greenwich provides computing modules as optional modules for learners, whereas in this qualification, all computing modules are core and compulsory modules.

REVIEW PERIOD

5 Years