QUALIFICATION SPECIFICATION SECTION A						
QUALIFICATION DEVELOPER	Limkokwing University of Creative Technology					
TITLE	Bachelor of Science (Honors) in Information Systems				**NCQF LEVEL**	8
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 Honors	√	Master		Doctor	
CREDIT VALUE					130	

1. RATIONALE AND PURPOSE OF THE QUALIFICATION

1.1 Rationale of the Qualification

The requirement for developing this qualification emanated from a labour market need indicating the scarcity of available information systems professionals able to analyse, design, evaluate, critique and coordinate business solutions in key occupational areas of research in Information Systems (HRDC Citation).The Human Resource Development Council Top 20 Occupation report (2016), highlights information technology as one of the occupations facing shortages in the labour market. In the long term however, a strong employment growth is anticipated.

Bachelor of Science (Honours) in Information Systems is carefully designed to cater for the future needs of employment growth that is anticipated in the ICT sector, as articulated in (HRDC citation). The qualification does not only address the technical skills only in terms of research, but also includes soft skills in the areas of business entrepreneurship. This will not only prepare the learner for research-based study at higher levels, but will also prepare them to become ready to venture into ICT based business operations. Thequalification'srationale is premised on the following documents;

- Maitlamo national ICT policy (2007)
- National Development Plan 11 (2010-2023)
- The Human Resource Development Council Top 20 Occupation report (2016)
- Limkokwing University Faculty of ICT Needs Analysis Document with Stakeholders.

Maitlamo National ICT Policy (2007) e-Readiness study, documented a list of findings with regards to human capital, technical infrastructure and the internet. The document strongly emphasises on the development of technically literate students in ICT if the country wishes to form a vibrant information system that would support a knowledge driven economy and a complaint information society. This qualification's structure addresses this requirement through research-oriented modules contributing adequately to prepare students for vertical articulation in M.Sc. or PhD study that are mostly related to identifying a problem and conducting intensive research to develop a solution to that problem or improve any existing solutions.

The National Development Plan 11 (2010-2023) advocated adoption and fostering for ICT as a tool for Botswana's economic diversification from non-renewable-resource driven economy to a knowledge driven

economy. This calls upon an implementation of Information Systems that provide a host of services to the nation as it drives towards a contextualised Botswana Information Society Community realised in the form of e-Government, e-Legislation, e-Education, e-Health, e-Commerce, e-Agriculture and e-Tourism. This can only be possible with necessary skills in Information Systems that drive the above, hence the need for Bachelor of Science (Honours) in Information Systems.

Botswana Human Resource Development Council Skills Development Priority Areas 2016 Report by the (HRDC TOP OCCUPATIONS IN HIGH DEMAND report, December 2016) In tandem with national strategic plan and national ICT policy HRDC's Top 20 occupation report of 2016, identified the sector of ICT in the form of information management skills as needed skills. The structure for this qualification includes modules such as Management Information Systems that will give the learner an opportunity to acquire such skill.

Bachelor of Science (Honors) in Information Systems Qualification, Needs Analysis with Stakeholders

Limkokwing University in consultation with Botswana ICT industry, *University alumni* and *current students* of Electronic Commerce conducted a needs analysis assessment on the need and relevance for the qualification. The institution conducted a labour market survey to gather requisite skills, knowledge and competencies in Information Systems from established SMEs and formal business entities. Various hard and soft skills needed for such qualification were specified as problem solving, critical thinking, information analysis, research, entrepreneurial, software development, data management and many others. The industry participant overall position was information management competences and ability to analyse business, and exploit opportunities offered by emerging technologies is now paramount. The survey responses recommended the Bachelor of Science (Honours) in Information Systems qualification programme relevant to the industry of Botswana and recommended the learning outcomes as appropriate. The programme modules were recommended as appropriate in addressing the learning outcomes as well. Industry participants were represented by Chairman of Botswana Information Society (BITS) and Chief Executive of CIT, Database Administrator University of Botswana, Former Chief Information Technology Air Botswana and Entrepreneur and finally the Director in the Directorate of Information Technology (DPSM), Botswana Government.

In Conclusion:

(a) There is need to develop information systems research-based skills so as to capitalise on emergent ICT skills related to information systems, data management and business analysis thus create a Botswana Knowledge based economy and Information Society in line with the aspirations of the National ICT Policy.

(b) Based on the advocacy of the National Development Plan strategic plan 11, and the Human Resource Development Council findings on top most labour market demanded skills according to the HRDC's op 20 occupation priority in the sector of ICT (HRDC TOP OCCUPATIONS IN DEMAND report, December 2016) information management and business analysis skills are mentioned as highly in demand for Botswana ICT Industry.

1.2 PURPOSE OF THE QUALIFICATION:

The purpose of the qualification is therefore to produce candidates who possess pertinent skills, knowledge and competencies in information systems and emerging technologies who engage in the following profiles;

- Systems Analyst
- IS Research Assistant

- Database Administrator
- Business Analysts
- Business Process Analyst
- Business IT Consultant

Furthermore, the qualification prepares the student for research intensive learning and analysis skills at higher levels. The qualification also empowers the learner to become entrepreneur in ICT sector. This means they will create jobs for other citizens and contribute towards the economy, leading to sustainable development as envisioned in Vision 2036.

2. ENTRY REQUIREMENTS (including access and inclusion)

2.1 Entry Requirements:

2.1.1 Normal Requirements

- Bachelor's Degree (NCQF Level 7) in Information Systems or any ICT-related field of study.

2.1.2 Recognition of Prior Learning (RPL)

An applicant who does not possess one of the qualifications which satisfies the University General Academic Entry Requirement may be considered through Accreditation of Prior Learning (APL) (both Certified Prior Learning and/or Prior Experiential Learning) as per the University's Admissions and Retention Policy.

2.1.3 Credit Transfer

Credit transfer shall also be recognised as an approach to enrol those who have certificates and Qualifications obtained from other institutions and recognised by BQA for purposes of placing them to an equivalent NCQF level as outlined in table 2 below.

Table 2: Credit Transfer based on NCQF levels

NCQF Level	Credit Exemptions
Level 7	480

2.2 Target Population

- Bachelors' Degree in ICT-related field (Level 7)
- Advanced Post Graduate Diploma in an ICT-related field with relevant work experience

3. QUALIFICATION SPECIFICATION SECTION B	
GRADUATE PROFILE (LEARNING OUTCOMES)	**ASSESSMENT CRITERIA**
3.1 Apply fundamental information system design concepts and computer-based techniques to solve business related problems.	3.1.1 Procure information systems solutions and configure them for optimum operation to meet business requirements. 3.1.2 Design applications and integrate systems to form Information Systems architectures 3.1.3 Use tools for testing, integration and deployment of business information systems 3.1.4 Manage information systems development and information systems projects. 3.1.5 Maintain information systems and create versions in response to new emerging technologies.
3.2 Derive appropriate models & methodologies for developing information systems to solve specific problems & user requirements.	3.2.1 Evaluate Modeling and design techniques for information systems, including a user centered design approach; 3.2.2 Analyse business information systems requirement needs based on stakeholder specifications. 3.2.3 Convert business requirements into technical specifications; 3.2.4 Apply quality assurance process throughout the design to maintenance of information systems 3.2.5 Select and use appropriate tools for developing IS models
3.3 Develop advanced database systems to support forecasting and advanced reporting to meet organisational requirements.	3.3.1 Analyse an organization's database performance requirements and recommend strategies for improvement. 3.3.2 Evaluate appropriate data management solutions for specific business needs and requirements. 3.3.3 Demonstrate the ability to design, build and implement a simple data warehouse system or decision support systems. 3.3.4 Implement database systems to support organization functionality 3.3.5 Troubleshoot database systems operations and recommend optimal solutions through research
3.4 Review business processes and optimize their operational efficiency	3.4.1 Analyse and align business IS needs and present a financial case 3.4.2 Apply business analysis and modeling tools to develop optimized Business Process Operations (BPRE) 3.4.3 Manage relevance and effectiveness of implemented information systems through software improvement processes (e.g. CMMI);

3. QUALIFICATION SPECIFICATION SECTION B	
GRADUATE PROFILE (LEARNING OUTCOMES)	**ASSESSMENT CRITERIA**
	3.4.4 Investigate techniques on gathering, managing, modeling, and specifying requirements 3.4.5 Automate business process based on derived models and techniques to enhance business performance
3.5 Create business analysis written reports to communicate to peers, company stakeholders, and business communities consistent with professional standards.	3.5.1 Apply software requirements elicitation techniques to gather and document relevant functionalities of information systems. 3.5.2 Develop information system specification document for purposes of engaging and agree with client in developing required information systems 3.5.3 Select appropriate tools for presenting information systems and user requirements to meetings, as required in the IS industry; 3.5.4 Differentiate different tools for creating information systems project reports 3.5.5 Select appropriate presentations and communicating tools based on different types of stakeholders and business communities
3.6 Research on topics in relation to Information Systems using appropriate research methods.	3.6.1 Apply theoretical and appropriate methodologies in designing research approaches 3.6.2 Select appropriate and relevant statistical, mathematical or experimental models to explain results of conducted information system research 3.6.3 Develop a comprehensive and articulate information systems research report 3.6.4 Publish findings of an information systems research and present to professional audience 3.6.5 Develop a critique sense and ability to discern correct and wrong information during research.
3.7 Apply analytical and critical thinking skills through use of information systems concepts for solving organizational problems.	3.7.1 Analyse practices and standards of ICT in various business contexts. 3.7.2 Analyse ways in which ICT improves the efficiency of a business. 3.7.3 Investigate on business problems and components or processes and develop technology-based solution to address. 3.7.4 Apply state of the art management theory and principles to decision making. 3.7.5 Apply emergent Information Systems technologies to solve contemporary problems

	Title	Level	Credits
FUNDAMENTAL COMPONENT Subjects / Units / Modules /Courses	Business Process Management	8	10
	Research Paper in Information System	8	15
	Introduction to Business Skills	7	10
	Systems Analysis and Integration	8	10
	Enterprise Architecture	8	10
	Database Management Systems	8	10
	Business Development & Entrepreneurship	8	10
CORECOMPONENT Subjects / Units / Modules /Courses	Research Methodology	8	15
	Research Proposal	8	15
	Academic Research Project	8	15
ELECTIVE COMPONENT Subjects / Units / Modules /Courses	Option 1: Decision Support Systems	9	10
	Option 2: Data Warehouse and Data Mining	9	10
	Option 3: IS Strategy, Management & Acquisition	9	10
	Option 4: IT-enabled Supply Chain Management	9	10

5 ASSESSMENT AND MODERATION ARRANGEMENTS

5.1. Assessment Strategies, Requirements and Weightings

All assessments, formative and summative, leading/contributing to the award of credits or a qualification should be based on learning outcomes and/or sub-outcomes.

Formative assessment

(a) Formative assessment or continuous assessment contributing towards the award of credits should be based on module learning outcomes.
(b) The formative assessment methods for this qualification are by:
    1. Test and
    2. Assignment.
(c) The contributions of formative assessments to the final mark are as follows:
    1. Test – 20%
    2. Assignment - 40%
(d) The contribution of formative assessment to the final grade is 60%

Summative assessment

(a) Summative assessments contributing towards the award of credits should be based on exit programme learning outcomes.

(b) Candidates may undergo assessment including written final examination for each module which contributes 40 % of the final mark for that module.
(c) The contribution of summative assessments to the final grade is 40%
(d) Candidates also undertake research modules which include assessment in research proposal and academic research project with a combination final grade of 100%.

Module Grading

(e) To pass a module, a final combined mark (summative +formative) of 50% is required.
(f) To pass the academic research project, final summative marks of 40% from research proposal and 60% from final research academic report is required.

5.2. Alternative Assessment Arrangements

There should be a **Special Needs Unit** whose responsibilities are sorely but not limited to;

(a) dealing with arrangements for students who may need additional support and/or access needs
(b) coordinating reasonable adjustments to assessment arrangements available
(c) identifying special needs students during application/admission process

5.3. Matching Learning Outcome and Assessments

The learning outcome assessment is largely based on the summative approaches as specified and discussed above. Table 5.3 lists the learning outcome and categorizes against the BQA learning outcome descriptors as in Knowledge, Skills and Competencies. For each learning outcome listed assessments types are discussed and assigned based on the intended learning outcome. For instance, competency descriptor is a largely behavioral outcome assessed through practices like projects works, development of software, research, and presentations.

Table 5.3: Types of assessments for the Qualification

Learning Outcome	Assessments Type
1. Apply fundamental information system design concepts and computer-based techniques to solve business related problems.	1. Final module exam 2. Midterm module test 3. Group Assignments ▪ Case Studies ▪ Group Interactive Sessions –Q&A 4. Individual Assignments ▪ Research papers ▪ Personal Q&A ▪ Developing models & applications ▪ Laboratory practical tests
2. Derive appropriate models & methodologies for developing information systems to solve specific problems & user requirements	1. Final module exam 2. Midterm module test 3. Group Assignments ▪ Fieldwork ▪ Presentations ▪ Group Interactive Sessions –Q&A 4. Individual Assignments ▪ Development of models

	▪ Problem solving reports ▪ Presentations ▪ Development of prototype
3. Develop advanced database systems to support forecasting and advanced reporting to meet organisational operational requirements.	1. Final module exam 2. Midterm module test 3. Group Assignments ▪ Case Studies ▪ Group Interactive Sessions –Q&A 4. Individual Assignments ▪ research papers ▪ Presentations ▪ Laboratory practical's-Creating databases
4. Review business processes and optimize their operational efficiency	1. Final module exam 2. Midterm module test 3. Group Assignments ▪ Case studies ▪ Fieldwork ▪ Research work 4. Individual Assignments ▪ Projects assessments ▪ Fieldwork
5. Create business analysis written reports to communicate to peers, company stakeholders, and business communities consistent with professional standards.	1. Final module exam 2. Midterm module test 3. Group Assignments ▪ Case Studies ▪ Problem solving reports ▪ Presentations ▪ Group Interactive Sessions –Q&A 4. Individual Assignments ▪ Case Studies ▪ Problem solving reports ▪ Presentations
6. Research on topics in relation to Information Systems using appropriate research methods.	1. Final module exam 2. Midterm module test 3. Group Assignments ▪ Case Studies ▪ Problem solving reports ▪ Presentations ▪ Group Interactive Sessions –Q&A 4. Individual Assignments ▪ Case Studies ▪ Problem solving reports ▪ Presentations 5. Research Work

7. Apply analytical and critical thinking skills through use of information systems concepts for solving organizational problems.	1. Final module exam 2. Midterm module test 3. Group Assignments ▪ Case Studies ▪ Problem solving reports ▪ Presentations ▪ Group Interactive Sessions –Q&A 4. Individual Assignments ▪ Case Studies ▪ Problem solving reports ▪ Critique research paper ▪ Develop research paper ▪ Compilation of research proposal ▪ Presentations

5.4. Internal moderation requirements

The following shall apply for both **internal and external moderation** in accordance with applicable policies and regulations:

1. Documentation

All necessary documents including: qualification document, alignment matrices, assessment instruments and Assessment criteria/rubrics should be available.

2. Pre-Assessment Moderation

Before administering any assessments that contribute towards the award of credits, moderation must take place. This should entail the following:

(a) Ascertaining that the assessment strategy to be used is appropriate for the learning outcome to be assessed
(b) Ascertaining that the assessment instrument adequately captures the learning outcomes against which assessment is to be carried out
(c) Ascertaining whether the assessment tasks or questions can enable the assessor to collect sufficient evidence that is typical of relevant exit level descriptors.
(d) Checking if the cover page contains all necessary information
(e) Checking if the assessment instrument layout is appropriate and that wording of assessment tasks or questions is appropriate.
(f) Checking if the assessment criteria or rubric is consistent with the learning outcomes against which assessment is to be done.

3. Post-Assessment Moderation

Moderators must verify that the assessment has been done in compliance with assessment principles. This should include the following:

(a) Checking if all scripts have been assessed using the same criteria.
(b) Verifying if assessment judgments and decisions have been done consistently and that principles such as validity, authenticity, currency and sufficiency have been considered.
(c) Checking if calculation of marks has been done correctly
(d) Checking if necessary, records and reports have been completed.

4. Sampling Procedure for Moderation

The total number of scripts to be sampled depends on the total number of candidates. If the number of candidates is 20 or less, the moderator should go through all the papers. For more than 20 candidates, the sample shall be 20 candidates plus 10% of the remaining total number of Scripts. The sample should be representative of the population of candidates in relation to performance, gender, etc.

5. Moderation reports

A moderation report shall capture, but not limited to the following:

(e) Sample size and sampling procedures
(f) Observations about the performance of candidates
(g) Consistency of assessment judgments and decisions
(h) Assessment instruments and alignment to learning outcomes
Recommendations for improvement

6 RECOGNITION OF PRIOR LEARNING (if applicable)

An applicant who does not possess one of the qualifications which satisfies the University General Academic Entry Requirement may be considered through the following criteria and guided by the University's Admissions and RPL Policy as accreditation of Recognition of Prior Learning (RPL) according to the following:

1. Prior Experiential Learning (PEL)
2. Certified Prior Learning. (CPL)
3. In some cases, both PEL and CPL could be used.

7 PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Learning Pathways

Horizontal articulation (related qualifications of similar level that graduates may consider)

This Qualification builds on from Botswana ICT Degree (Level 8) qualifications and others recognised by the Botswana Qualifications Authority in ICT as related to the following:

- Level 8: Bachelor of Science (Honors) in Information Resources Management
- Level 8: Bachelor of Science (Honors) in Information Science
- Level 8: Bachelor of Science (Honors) in Computer Information Systems
- Level 8: Bachelor of Science (Honors) in Accounting Information systems

Vertical articulation in Bachelor of Science (Honors) in Information Systems may also lead to further studies in;

- Level 9: Master of Science in Information Systems
- Level 9: Master of Science in Information Science
- Level 9: Master of Science in Information and Quantitative Science

Employment Pathways

Graduates of the Qualification may find employment in a range of public and private organisations for the following posts.

Typical roles include

- Business Analyst,
- Database Administrator
- Database Analyst
- Application Developer

- Business Process Analyst
- IS Research Assistant

8 QUALIFICATION AWARD AND CERTIFICATION

Minimum standards of achievement for the award of the qualification;
A candidate is required to achieve the stipulated total credits of 130 inclusive of the fundamental, core and elective components, to be awarded the qualification.

Certification:
Candidates meeting prescribed requirements will be awarded the qualification in accordance with standards prescribed for the award of the qualification and applicable policies.

The graduates' class of degree will be determined by the weighted average mark for all modules, contributing to the Honors assessment using the classification boundaries presented in the table below.

Class of Degree	Weighted Average
First Class Honors	80+%
Second Class Honors (Division I)	70-79%
Second Class Honors (Division II)	60-69%
Third Class Honors	50-59%

In the event that the learner does not complete the qualification, a letter will be awarded indicating the credits accumulated at the point of exit, accompanied by a transcript.

9 INTERNATIONAL AND REGIONAL COMPARABILITY

9.1. THE INTERNATIONAL AND REGIONAL COMPARABILITY LOOKED AT THE FOLLOWING ATTRIBUTES

(a) Exit outcomes
(b) Duration
(c) Qualification Credits
(d) Elective availability
(e) Content

9.2. INTERNATIONAL COMPARABILITY

Criteria		Carnegie Mellon University	University of Northumbria	Swinburne University of Technology
Country		Australia	UK	UK
Title of Qualification		BSc (Hons) Information Systems	BSc (Hons) Information Systems	BSc (Hon) Information Systems
NQF Level & Credit Values		▪ Honours Level ▪ 140 Credits	▪ Honours Level ▪ 130 credits	▪ Honours Level ▪ 135 Credits
Main Exit Outcomes	Academic Research	√	√	√
	IS Innovation	√	√	√
	Business Analysis	x	√	x
	Data Management	√	√	x
	User Experience	√	x	√
	IT Project Management	x	x	√
	Data Warehouse	√	√	x
Electives Availability	Business Intelligence	x	x	√
	Decision Support	√	√	√

	Business Strategy	√	√	√
Duration(Years)		1	1	1
Source –URL		https://pdfs.semanticscholar.org/8fec/f36d913cf7a3f6e2415b4808f113fc7889a9.pdf	https://www.northumbria.ac.uk/static/5007/bepdf/bishandbook.pdf	https://www.swinburne.edu.au/study/course/bachelor-of-business-information-systems/business-analysis/

9.3. REGIONAL COMPARABILITY

Criteria		Monash University	Midlands State University	University of Venda
Country		South Africa	Zimbabwe	South Africa
Title of Qualification		BSc (Hons) Information Systems	BSc(Hons) Management Information Systems	BSc (Hons) Information Systems
NQF Level & Credit Values		▪ Honours Level ▪ 90Credits	▪ Honours Level ▪ 110credits	▪ Honours Level ▪ 140 Credits
Main Exit Outcomes	Academic Research	√	√	√
	IS Innovation	√	√	√
	Business Analysis	√	x	√
	Data Management	x	x	x
	User Experience	√	√	√
	IT Project Management	x	√	x
Elective Areas of Interest	Data Warehouse	√	√	√
	Business Intelligence	x	x	√
	Decision Support	√	√	x

	Business Strategy	√	√	√
Duration(Years)		1	1	1
Source –URL		http://www.monash.edu/pubs/handbooks/aos/business-information-systems---south-africa/	http://www.trustacademy.ac.zw/mumbure/index.php/icttt/8-frontpage/230-bachelor-of-management-information-system-bmis	http://www.univen.ac.za/school-of-management-sciences/business-information-systems/

Guidelines to Exit Learning Outcomes

- Business Analysis exit outcome: This focuses on business analysis and managing software development processes.
- User Experience exit outcome: This focuses on human computer interaction (HCI).
- IT Project Management exit outcome: This focuses on the tools and techniques used in IT project management.
- Information Systems Innovation exit outcome: This focuses on innovation to address organizational needs and opportunities.
- Academic Research exit outcome: This focuses on providing knowledge base for carrying out academic research
- Data Management exit outcome: This focuses on information creation, storage, and management

9.4. Explanation of Regional comparability: Similarity, Differences , Portability and Generalisation

Similarities

- All qualifications emphasise on research to ensure development of research competencies.
- All qualifications offer electives as areas of further specialization in the qualifications, i.e. applied domain.
- All qualifications cover some areas of knowledge in the domain of Information Systems.
- Majority of the qualifications use the learning outcome-based approach and cover the learning outcome descriptors of the NCQF

Differences

- The total credits awarded at the completion of the qualification are different

- Some qualifications do not use the notional 10 hours of learning
- Some qualifications have direct entry, but they will have done advanced level

Contextualization

The qualification is contextualised by benchmarking the areas stated above as follows;

- The National Qualification Level shall be BQA NCQF Level 8 and is an honours degree like many regional qualifications stated
- The Bachelor of Science (Honors) in Information Systems Qualification shall also adopt elective as means of co-opting specialization according to a majority of the universities
- The Bachelor of Science (Honors) in Information Systems Qualification shall put emphasis on research practice to build competency in research and ensuring practical assessments in all practical modules
- The Bachelor of Science (Honors) in Information Systems Qualification shall adopt the qualifications learning outcome like a majority of the universities and this in line with the BQA NCQF.

Portability and Generalisation

The Bachelor of Science (Honors) in Information Systems Qualification is based on the similarities and minor differences determined is portable and generalisable within the regional Universities. In addition, the modules specified in the qualifications for the domain Information Systems fall along the same guidelines and compliance according to the Information System guidelines on developing curriculum for Information Systems graduates. This also adds to the level of standardisation and general portability of the Bachelor of Science (Honors) in Information Systems Qualification.

REVIEW PERIOD

Every 5 years

Other information – please add any supplementary information to help the application for this qualification for NCQF Registration.

N/A