BQA NCQF Qualification Template

QUALIFICATION SPECIFICATION SECTION A							
QUALIFICATION DEVELOPER	INSTITUTE OF DEVELOPMENT MANAGEMENT						
TITLE	Diploma in Information Technology				**NCQF LEVEL**		6
FIELD	Information Communication and Technology		**SUB-FIELD**	Information Technology			
New qualification		✓	Review of existing qualification				
SUB-FRAMEWORK	General Education		TVET			Higher Education	✓
QUALIFICATION TYPE	Certificate		Diploma	✓		Bachelor	
	Bachelor Honours		Master			Doctor	
MINIMUM CREDIT VALUE						364	

RATIONALE AND PURPOSE OF THE QUALIFICATION
With the ever-increasing demand and growth of the Information Technology industry in Botswana, it is becoming more and more a realization for the need of good and skilled Information Technology workers. The Government of Botswana has long realized the critical role of Information and Communication Technology (ICT) in economic development. This was consolidated and articulated in the National Information Technology Policy of 2007, commonly referred to as *Maitlamo* which presents ICT as a key driver of social, economic, cultural, and political transformation.

The Thuto Net strategy under the Ministry of Education and Skills Development aims to use ICT as an enabler to enhance the teaching learning process through E-learning. The Education and Training Sector Strategic Plan (ETSSP 2015-2020) which sets out to improve the performance of the education sector views ICT as a driver of all the key initiatives and hence sets out to utilize and integrate ICT in the education sector. Similarly, all other sectors are repositioning themselves to optimize the use of ICT for enhance their performance and contribute to the envisaged transformed Botswana characterized by sustained economic growth.

Human Resource Development Council (HRDC) top occupational demand identified Information Communication and Technology use in modern world of work as critical as it facilitates awareness, easy access of information and policymaking decisions on dynamics of the labour market.

Botswana Vision 2036 acknowledges Information and Communication Technology as a key contributor to economic growth enabling private and public sector employment growth opportunities (Page 17).

The purpose of the qualification is to:

1. Produce graduates that demonstrate through their own study and practice, knowledge of information technology.

2. Produce graduates able to demonstrate through their own practice, specialist technical competencies in the laboratory and professional workplace related to information technology, and advanced knowledge of theoretical concepts applicable to their information technology.
3. Graduates that conduct investigations to critically analyse and evaluate complex ideas and apply established theories to identify solutions to complex problems relating to information technology.
4. Graduates that are effective communicators of technology by communicating technical knowledge and concepts and transferring complex knowledge and technical ideas to a variety of audiences using a range of written and oral communication modes.

ENTRY REQUIREMENTS (including access and inclusion)

The normal entry requirement into the qualification shall be:

1. NCQF Level IV Certificate.

2. There will be admission with provisions through CAT and National RPL Policies.

3.

QUALIFICATION SPECIFICATION	SECTION B

GRADUATE PROFILE (LEARNING OUTCOMES)	ASSESSMENT CRITERIA
1. Demonstrate understanding of information technology principles in solving real world business problems.	1.1 Apply basic principles of information technology. 1.2 Perform user management and file system management using information technology principles. 1.3 Perform various administrative tasks in different computing environment. 1.4 Design information technology solutions for business.
2. Demonstrate understanding of computer network requirements and provide solutions to business needs.	2.1. Apply networking concepts by using a network design simulator. 2.2. Evaluate different network topologies and protocols. 2.3. Create logical and physical network 2.4. Create a LAN (Local Area Network). 2.5. Apply the principles and create a LAN and WAN.
3. Design and develop object-oriented programmes to address loosely defined problems in software engineering and creative publication of web development	3.1 Analyze a set of classes and their interrelationships to address the problem 3.2 Apply effective use of encapsulation, inheritance and polymorphism. 3.3 Select and reuse pre-existing objects and templates specializing as required. 3.4 Structure the design so that objects communicate efficiently.

	3.5 Specify the properties and behavior of classes to allow efficient implementation, selecting appropriate data types, data and file structures and algorithms. 3.6 Apply the design using well-established Notations. 3.7 Apply appropriate data validation and error handling techniques. 3.8 Create and work with illustrations, graphics, special effects, and color management. 3.9 Demonstrate knowledge in key stages of software development lifecycles. 3.10 Create, enhance and manipulate simple shapes, logos and advertisements.
4. Demonstrate skills competencies in database design and software development in information technology to solve business problems.	4.1 Summarize the common uses of database systems. 4.2 Demonstrate knowledge for database management system (DBMS). 4.3 Summaries the advantages and disadvantages of a DBMS. 4.4 Create database tables based on a data dictionary.
5. Demonstrate knowledge and understanding of concepts and technologies used to establish and maintain network security and computer architecture design	5.1 Analyze and evaluate network security needs of an organization. 5.2 Analyze software vulnerabilities and security solutions to reduce the risk of exploitation. 5.3 Design network security solutions for business need. 5.4 Understand the Public-key Infrastructure. 5.5 Be able to perform simple vulnerability assessments and password audits. 5.6 Be able to build and configure computer architecture. 5.7 Assemble and build a computer system based on computer architecture design.
6. Understand the project management techniques, tools and methods of systems analysis and design in a business environment	6.1 Apply project management principles, tools and techniques. 6.2 Understand both the nature of 'information systems analysis and design' and its various components. 6.3 Demonstrate knowledge on the different phases of Systems Development Life Cycle (SDLC).

	6.4 Appreciate the use of systems design techniques, methodologies, and tools.
7. Demonstrate knowledge in data analytics, computer mathematics and its algorithm in solving real-time solutions	7.1 Demonstrate competency in core mathematics calculations. 7.2 Analyze relevant ethical issues arising from data usage and data recovery. 7.3 Describe several areas of mathematics beyond calculus. 7.4 Demonstrate the ability to understand and write mathematical proofs. 7.5 Understand the basic principles of sets and operations in sets. 7.6 Analyze existing theories, methods and interpretations within the subject area and work independently in applying and evaluating different storage and data processing technologies. 7.7 Contribute to new ideas and innovation processes by introducing data-driven approaches. 7.8 Analyze and interpret data using an ethically responsible approach.
8. Apply knowledge and skills in integrating classroom theory and workplace practice	8.1 Demonstrate professionalism in workplace. 8.2 Apply classroom theories to industry practice. 8.3 Develop skills and techniques directly applicable to their careers.

QUALIFICATION STRUCTURE SECTION C			
FUNDAMENTAL COMPONENT Subjects / Units / Modules /Courses	**Title**	**Level**	**Credits**
	Communications and Academic Writing Skills	5	**12**
	ICDL Computer Essentials	5	**5**
	ICDL Word Processing	5	**5**
	ICDL Spreadsheets	5	**5**
	ICDL Online Essentials	5	**5**
	Professional Communication	6	**12**
	Introduction to Entrepreneurship and Innovation	6	**10**
CORE COMPONENT Subjects / Units / Modules /Courses	Introduction to Information Systems	6	**10**
	Computational Mathematics and Algorithms	6	**10**
	Website Design (WEBDN)	6	**10**
	Principles of Object-Oriented Programming	6	**10**
	Computer Organization and Architecture	6	**10**

	Database Theory and Practice	6	**15**
	Network Administration I (Routing)	6	**15**
	Systems Analysis and Design	6	**15**
	IT Project Management Fundamentals	6	**15**
	Dynamic Web Design	6	**15**
	Network Server Administration Infrastructure	6	**15**
	Software Engineering	6	**15**
	Network Administration II (Switching)	6	**20**
	Network Security	6	**15**
	Managing Business Information	6	**15**
	Information Systems Projects	6	**15**
	Creative Publication	6	**15**
	Ethical Hacking	6	**15**
	Ethics in Information Technology	6	**10**
	Industrial Attachment	6	**30**
	Information Technology Project (REPROJ202)	6	**20**
ELECTIVE COMPONENT Subjects / Units / Modules /Courses			

Rules of combinations, Credit distribution (where applicable):

Level & Credit	Fundamental	Core	Elective
5	32	0	0
6	22	310	0
7	0	0	0
8	0	0	
Total	54	310	
Grand Total			364

- This qualification will have at least 364 credits and takes 3 years to complete
- The credit combination for this qualification is from 54 fundamental components, 310 core components
- The qualifications structure is premised on these rules of combination.

ASSESSMENT AND MODERATION ARRANGEMENTS

This qualification is assessed and moderated as follows:

Summative assessment
Summative assessment based on learning outcomes leading to the award of the qualification will be done by means of a written examination (of at least 3 hours) at the end of every module (per module) contributing 60% of the overall mark.

Formative assessment- informs teaching and learning
Learners are continuously assessed to evaluates learner learning, knowledge, proficiency which constitutes 40% of the overall module mark:

Moderation:
The moderation process of assessments focuses on ensuring the assessment is aligned to the module learning objectives and the learning outcomes.

Professional registration and accreditation
Assessors and moderators must have valid registration and accreditation with all or some of the relevant bodies such as:
- Botswana Qualifications Authority (BQA)
- Fortinet Network Security Expert
- Computer Information System Company- CISCO

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 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 and international professional bodies.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Horizontal articulation (related qualifications of similar level that graduates may consider)
Diploma in Software Engineering
Diploma in Computer Networks
Diploma in Mobile Applications
Diploma in Computing

Vertical Articulation- Pathways which the holders may progress to
Bachelor of Science in Software Engineering
Bachelor of Science e in Computer Networks
Bachelor of Science in Mobile Applications
Bachelor of Science in Computing

Employment Pathways

System Administrator
Network Administrator
Information Technology Entrepreneur

Information Technology User Support
Systems Analyst
Information Technology Consultant
Software Developer
Database Administrator

QUALIFICATION AWARD AND CERTIFICATION

To be awarded this qualification, a candidate must complete 54 Credits of the Fundamental Component, 310 Credits of the Core component. Those who meet that requirement will be issued a certificate

To be awarded the Diploma in Information Technology the learnermust achieve a minimum of 50% pass in all the modules registered and required for the qualification.

REGIONAL AND INTERNATIONAL COMPARABILITY

Regionally
1. **UNISA –**Diploma in Information Technology (SAQA)
    National Qualifications Framework Level: 6
    Credit Value: 360
    Duration: 2 years
    Similarities:
    Introduction to Information Systems [15 Credits]
    Computational Mathematics and Algorithms [15 Credits]
    Web Design [15 Credits]
    Data Communications and Networks [15 Credits]
    Systems Analysis and Design [15 Credits]
    Database Theory and Practice [15 Credits]
    Software Engineering [15 Credits]
    Network Technical Skills [15 Credits]

    Differences:
    Business Informatics [15 Credits]
    E-Business [15 Credits]
    Digital Logic [20 Credits
    Professional Issues In IT/Ethical Issues in IT [15 Credits]
    IT Security [15 Credits]
    IT Project Management [15 Credits]
    Introduction to financial Accounting [10 Credits]
    Interactive programming [15 Credits]

2. **Vaal University of Technology – Diploma in Information Technology (**SAQA**)**
    Nationa Qualifications Framework Level: 6
    Credit Value: 360
    Duration: 1 Year
    Similarities
    Information Systems [15 Credits]
    Programming [15 Credits]
    Web Development [15 Credits]

Differences
Business Analysis [15 Credits]
Accounting Skills [15 Credits]
Artificial Intelligence [20 Credits]

Internationally
- The curriculum incorporates the latest trends, standards and practices in the discipline
- Well-qualified academics and industry practitioners act as external examiners and moderators of thequalification;

1. **England - British Computer Society (BCS) Diploma in Information Technology**.
   Regulated Qualifications Framework Level: 5
   Credit Value: 120
   Duration: 1 Year

   Course   Syllabus:

   Year   One:

- Computer Technology Fundamentals. [15 Credits]
- Software Development and Programming Techniques. [15 Credits]
- Principles of Information Systems. [15 Credits]
- Professional Issues in Information Systems Practice. [15 Credits]

   Year   Two:

- Database Systems. [15 Credits]
- Information Technology Project Management. [15 Credits]
- Object Oriented Programming (Java). [15 Credits]
- Practical   Project.   [30   Credits]

   The qualification: British Computer Society (BSC) Diploma in Information Technology offered by West London College is also comparable with the Botswana IDM Diploma in Information Technology, especially in terms of subjects offered. The British qualification is a two-year qualification as Botswana IDM's Diploma in Information Technology. It also acts as the first two years of a Degree.

2. **NCC Education Level 4 Diploma in Computing-** The Level 4 Diploma in Computing (L4DC) is the first year of the NCC Education degree journey. The qualification is equivalent to the first year of a Computing degree qualification in the UK university system.
   Regulated Qualifications Framework Level: 4
   Credit Value: 120
   Duration: 1 Year

   Similarities:
   Computer Organisation Architecture [15 Credits]
   Professional Issues in IT [15 Credits]

Database Theory and Practice [15 Credits]
Computer Organisation and Architecture [15 Credits]
IT Project [20 Credits]

Differences:
Agile Development [20 Credits]

REVIEW PERIOD
Every 5 years. However, the IT landscape is forever changing, and review of the qualification will provide a window for constant refining and updating where applicable, arising from legislative changes or stakeholder feedback