	<b>BQA NCQF QUALIFICATION TEMPLATE</b>	Document No.	DNCQF.QIDD.GD02
		Issue No.	01
		Effective Date	04/02/2020

SECTION A: QUALIFICATION DETAILS													
<b>QUALIFICATION DEVELOPER (S)</b>				Department of Teacher Training and Technical Education (TT & TE)									
<b>TITLE</b>		DIPLOMA IN SYSTEMS ADMINISTRATION								<b>NCQF LEVEL</b>		6	
<b>FIELD</b>		INFORMATION & COMMUNICATION TECHNOLOGY			<b>SUB-FIELD</b>		SYSTEMS ADMINISTRATION			<b>CREDIT VALUE</b>		361	
New Qualification					<input checked="" type="checkbox"/>		Review of Existing Qualification						
<b>SUB-FRAMEWORK</b>		General Education			<input type="checkbox"/>		TVET			<input checked="" type="checkbox"/>		Higher Education	
<b>QUALIFICATION TYPE</b>		Certificate	I	II	III	I	V	Diploma	<input checked="" type="checkbox"/>	Bachel or			
		Bachelor Honours		Post Graduate Certificate				Post Graduate Diploma					
		Masters				Doctorate/ PhD							
<b>RATIONALE AND PURPOSE OF THE QUALIFICATION</b> <p>Sub field of Systems Administration has been identified as one of the occupations in high demand in Botswana and beyond (HRDC Occupation Code No. 2522). This is based on the Labour Market Analysis conducted by the HRDC.</p> <p>This qualification has been developed in line with Botswana Government's Vision 2036 which acknowledges Information and Communication Technology (ICT) identified as one of the key contributors to economic growth and employment creation (page 17) and NDP11 (page 71)</p> <p>The Vision further emphasizes implementation of curriculum which is aligned to the needs of the economy and business, science, mathematics and technology (page 20).</p> <p>This qualification was developed following thorough consultations with industry practitioners in the subfield together with trainers/assessors in the TVET institutions who identified, analysed and verified a set of typical</p>													

	<b>BQA NCQF QUALIFICATION TEMPLATE</b>	Document No.	DNCQF.QIDD.GD02
		Issue No.	01
		Effective Date	04/02/2020

Duties, Tasks, Generic Skills, Attitudes and future trends for the occupation of a “Systems Administrator”. The data obtained here was used by TVET trainers to develop most of the Exit level outcomes and Learning Outcomes which eventually resulted in a Learning Programme which was also audited by another team of Industry Experts and TVET trainers.

### **PURPOSE:**


The purpose of this qualification is to produce ICT professionals with advanced technical knowledge, skills, and competencies to enable them to:

- Design, plan, implement and monitor networked systems based on different scenarios, requirements, and limitations.
- Evaluate and install computer hardware, networking software, operating system, and software applications.
- Operate master consoles to monitor the performance of computer systems and networks.
- Coordinate access and use of computer networks.
- Maintain, troubleshoot, and administer the use of Local Area Networks, Wide Area Networks, Computer Workstations, Internet connections and peripheral equipment.
- Apply safety and health principles in an ICT related working environment
- Apply project management disciplines and concepts in a given project


### **ENTRY REQUIREMENTS (including access and inclusion)**


Minimum entry requirement for this qualification is NCQF Level IV or equivalent.


Credit Accumulation and Transfer (CAT) and Recognition of Prior Learning (RPL) provisions shall be made for learners to access the qualification in line with institutional and national policies on CAT and RPL.

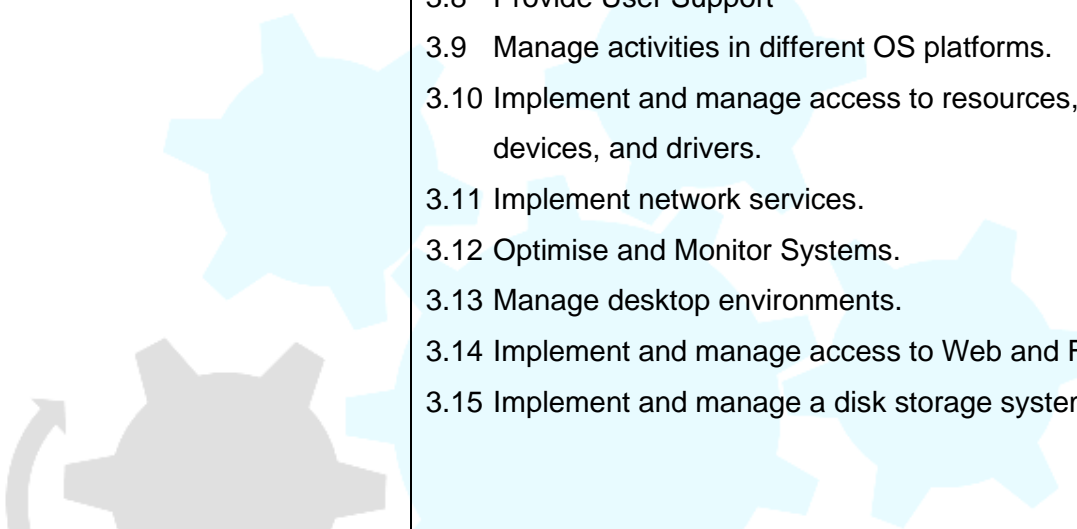
	<b>BQA NCQF QUALIFICATION TEMPLATE</b>	Document No.	DNCQF.QIDD.GD02
		Issue No.	01
		Effective Date	04/02/2020


<b>SECTION B</b>		<b>QUALIFICATION SPECIFICATION</b>	
<b>GRADUATE PROFILE (LEARNING OUTCOMES)</b>		<b>ASSESSMENT CRITERIA</b>	
<p>1. Apply a wide range of current and emerging specialised server administration knowledge, skills and techniques to implement server and storage solutions</p>		<p>1.1 Analyse the conceptual, physical, and logical design factors for the network and directory services infrastructure.</p> <p>1.2 Plan and Implement Directory Services infrastructure.</p> <p>1.3 Prepare and implement virtualisation technologies.</p> <p>1.4 Plan and implement organisational unit strategy.</p> <p>1.5 Administer group policies.</p> <p>1.6 Maintain directory services infrastructure.</p> <p>1.7 Implement a Domain Name System</p> <p>1.8 Implement a Dynamic Host Configuration Protocol.</p> <p>1.9 Configure network interfaces.</p> <p>1.10 Manage Remote Access to Server Resources.</p>	


	<b>BQA NCQF QUALIFICATION TEMPLATE</b>	Document No.	DNCQF.QIDD.GD02
		Issue No.	01
		Effective Date	04/02/2020


<p><b>2.</b> Design, Configure, implement, monitor and maintain network infrastructure to support organisational operations using current and emerging network administration expertise</p> 	<p>2.1 Construct a Local Area Network using different networking media.</p> <p>2.2 Configure appropriate networking protocols and standards.</p> <p>2.3 Configure an intranet for a specific company.</p> <p>2.4 Design and install a wireless Network.</p> <p>2.5 Implement Cloud Computing Services.</p> <p>2.6 Configure Point-to-Point Protocol.</p> <p>2.7 Configure Network Address Translation.</p> <p>2.8 Implement IPv6 Addressing Services.</p> <p>2.9 Implement Virtual Private Network.</p> <p>2.10 Install a database management platform.</p> <p>2.11 Develop a logical data model.</p> <p>2.12 Implement a physical database.</p> <p>2.13 Manipulate data in the database.</p> <p>2.14 Tune and optimise access to data in the database.</p> <p>2.15 Implement a security system on a given network infrastructure.</p> <p>2.16 Implement a database security plan.</p>
<p><b>3.</b> Implement secure solutions for access and use of devices, servers, networks, and data storage through the application of updated expertise and emerging IT security techniques</p>	<p>3.1 Plan and Install Network Server Components.</p> <p>3.2 Maintain a network server environment.</p> <p>3.3 Plan for Business Continuity in the event of a disaster.</p> <p>3.4 Install, configure, and upgrade Personal Computer and Server Hardware and Software.</p> <p>3.5 Troubleshoot and resolve PC and server hardware Problems.</p> <p>3.6 Carryout procedures to recover system failures</p>

	<b>BQA NCQF QUALIFICATION TEMPLATE</b>	Document No.	DNCQF.QIDD.GD02
		Issue No.	01
		Effective Date	04/02/2020


	<p>3.7 Troubleshoot Printers.</p> <p>3.8 Provide User Support</p> <p>3.9 Manage activities in different OS platforms.</p> <p>3.10 Implement and manage access to resources, hardware devices, and drivers.</p> <p>3.11 Implement network services.</p> <p>3.12 Optimise and Monitor Systems.</p> <p>3.13 Manage desktop environments.</p> <p>3.14 Implement and manage access to Web and FTP Services.</p> <p>3.15 Implement and manage a disk storage system.</p>
<p><b>4.</b> Carry out ICT related projects and tasks assigned in a relevant work/business place environment within specified parameters in a safe and professional manner.</p>	<p>4.1 Plan for a Work placement in any specialised IT environment.</p> <p>4.2 Negotiate for a work placement.</p> <p>4.3 Undertake a work placement.</p> <p>4.4 Evaluate a work placement.</p> <p>4.5 Carry out an integrated project applying project life cycle concepts.</p> <p>4.6 Investigate health and safety requirements in an IT related environment.</p> <p>4.7 Apply safe use of IT related tools and equipment.</p> <p>4.8 Maintain safe and secure environment in the workplace.</p>
<p><b>5.</b> Apply effective interpersonal, collaborative and communication skills professionally and ethically</p>	<p>5.1 Evaluate concepts of work ethics and Professionalism.</p> <p>5.2 Analyse ethical issues arising in the workplace.</p> <p>5.3 Evaluate the influence of believe system on the workforce</p>

	<b>BQA NCQF QUALIFICATION TEMPLATE</b>	Document No.	DNCQF.QIDD.GD02
		Issue No.	01
		Effective Date	04/02/2020

<p>when working with clients and colleagues in an IT environment</p> 	<p>supervisory skills.</p> <p>5.4 Apply organisational skills in the workplace.</p> <p>5.5 Prepare supervisory plans.</p> <p>5.6 Demonstrate ethical leadership in the workplace.</p> <p>5.7 Demonstrate mastery of the interview process.</p> <p>5.8 Conduct formal meetings.</p> <p>5.9 Produce investigative reports.</p> <p>5.10 Present a research proposal.</p> <p>5.11 Review secondary data relating to research objectives.</p> <p>5.12 Design data collection tools for primary data collection.</p> <p>5.13 Compile a research proposal.</p>
<p><b>LEARNING OUTCOME 6</b></p> <p>Demonstrate competencies in applying essential business strategies, principles, and techniques to start a small to medium or micro enterprises and to ensure its effective functioning</p>	<p>6.1 Prepare a business plan.</p> <p>6.2 Sell goods and services.</p> <p>6.3 Evaluate the business operation.</p>


	<b>BQA NCQF QUALIFICATION TEMPLATE</b>	Document No.	DNCQF.QIDD.GD02
		Issue No.	01
		Effective Date	04/02/2020

<b>SECTION C</b>	<b>QUALIFICATION STRUCTURE</b>				
<b>FUNDAMENTAL COMPONENT</b> <i>Subjects/ Courses/ Modules/Units</i>	<b>TITLE</b>	<b>Credits Per Relevant NCQF Level</b>			<b>Total (Per Subject/ Course/ Module/ Units)</b>
		<b>Level [ 5 ]</b>	<b>Level [ 6 ]</b>	<b>Level [ 7 ]</b>	
	Communication Skills	8			8
	Entrepreneurship	8			8
	Supervisory Skills		6		6
	Work Ethics and Professionalism		8		8
	Research Skills		8		8
	Occupational Health and Safety	6			6
	Numeracy		8		8
<b>TOTAL</b>					<b>52</b>

 <b>BOTSWANA</b> Qualifications Authority	<b>BQA NCQF QUALIFICATION TEMPLATE</b>	Document No.	DNCQF.QIDD.GD02
		Issue No.	01
		Effective Date	04/02/2020

<b>CORE COMPONENT</b>  <i>Subjects/Courses/ Modules/Units</i>	Workstation Operating System	15			15
	Server Implementation		15		15
	PC Hardware and Software	15			15
	Network Server Operating System	15			15
	Local Area Network Technology	15			15
	Directory Services Administration		18		18
	Network Services Administration		18		18
	Network Infrastructure Analysis		15		15
	Wide Area Network Technology		18		18
	Wireless Networking	15			15
	Cloud Computing		15		15
	Network Security		15		15
	Integrated Project		30		30
	Work Placement		60		60
<b>ELECTIVE/ OPTIONAL COMPONENT (Choose 2)</b>  <i>Subjects/Courses/ Modules/Units</i>					
	Web Technologies	15			15
	Database Administration	15			
	Linux Operating System		15		15
	Project Management		15		
<b>TOTAL</b>					30



	<b>BQA NCQF QUALIFICATION TEMPLATE</b>	Document No.	DNCQF.QIDD.GD02
		Issue No.	01
		Effective Date	04/02/2020

### **SUMMARY OF CREDIT DISTRIBUTION FOR EACH COMPONENT PER NCQF LEVEL**

#### **TOTAL CREDITS PER NCQF LEVEL**

<b>NCQF Level</b>	<b>Credit Value</b>
Level 5	112
Level 6	249
<b>TOTAL CREDITS</b>	<b>361</b>

#### **Rules of Combination:**


**(Please Indicate combinations for the different constituent components of the qualification)**

The rules of combination for this qualification are defined below and cover the minimum and maximum credit values required to be accumulated, along with details of any mandatory units.

<b>COMPONENT</b>	<b>LEVEL 5</b>	<b>LEVEL 6</b>
<b>Fundamental</b>	<b>22 credits</b>	<b>30 credits</b>
<b>Core</b>	<b>75 credits</b>	<b>204 credits</b>
<b>Elective</b>	<b>15 credits</b>	<b>15 credits</b>

The Fundamental Component consists of **52 credits** all of which are compulsory.

- The Core Component consists of **279 credits** all of which are compulsory.
- Elective Component consists of **30 credits**.
- The Total Minimum number of Credits should be **361 Credits** for the qualification award.

	<b>BQA NCQF QUALIFICATION TEMPLATE</b>	Document No.	DNCQF.QIDD.GD02
		Issue No.	01
		Effective Date	04/02/2020

## **ASSESSMENT ARRANGEMENTS**

### **FORMATIVE ASSESSMENT**

Formative assessment or continuous assessment contributing towards the award of credits should be based on module (unit) outcomes. This may include:

- Tests
- Assignments
- Research project
- Simulated Practice in computer or network Laboratories
- Real work practice in the IT related industry set up

The contribution of formative assessment to the final grade shall be 60%.

### **SUMMATIVE ASSESSMENT**

Candidates shall undergo assessment. The final assessment for each module (unit) contributes 40% of the final mark for that module.

Assessment activities shall be carried out by BQA registered and accredited assessors.


## **MODERATION ARRANGEMENTS**

BQA accredited subject specialists in relevant fields with relevant industry experience and academic qualifications shall be engaged to conduct internal and external moderation in accordance with applicable policies and regulations.

## **RECOGNITION OF PRIOR LEARNING**

Recognition of Prior Learning (RPL) Policy and Procedures are in place.

Candidates may submit evidence of prior learning and current competence and/or undergo appropriate forms of RPL assessment for the award of the qualification in accordance with applicable RPL policies and relevant 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.

	<b>BQA NCQF QUALIFICATION TEMPLATE</b>	Document No.	DNCQF.QIDD.GD02
		Issue No.	01
		Effective Date	04/02/2020

### ***CREDIT ACCUMULATION AND TRANSFER***

Candidates may submit evidence of credits accumulated in related qualification in order to be credited for the purposes of the award of Diploma in Systems Administration.

### ***PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)***

#### ***LEARNING PATHWAYS***

Horizontal Articulation (related qualifications at NCQF Level 6 level that graduates may consider

- Diploma in Network Technology.
- NCQF Level 6 - Diploma in Web Design.
- NCQF Level 6 - Diploma in Software Engineering.
- NCQF Level 6 - Diploma in Information Technology.

Graduates may consider undertaking professional certifications since vendor training is recognized internationally as an industry benchmark for product specific training.


Vertical Articulation (qualifications at NCQF Level 7 to which the holder may progress to)

- Bachelor's Degree in systems administration.
- Bachelor's Degree in Network Technology.
- Bachelor's Degree in Software Engineering
- Bachelor's Degree in Computer Science.
- Bachelor's Degree in Information Technology.

#### ***EMPLOYMENT PATHWAYS***

On successful completion of this qualification the holder may be absorbed in the job market as:

- System Administrator.
- Network Supporter.
- Entrepreneur in IT and related areas.
- IT User Support.
- System Analyst.

	<b>BQA NCQF QUALIFICATION TEMPLATE</b>	Document No.	DNCQF.QIDD.GD02
		Issue No.	01
		Effective Date	04/02/2020

### QUALIFICATION AWARD AND CERTIFICATION

For a Candidate to be awarded Diploma in Systems Administration must acquire a minimum of 361 credits.


#### Certification

A certificate will be awarded to a Candidate upon completion of the qualification in accordance with applicable policies.


### REGIONAL AND INTERNATIONAL COMPARABILITY

This qualification has been benchmarked against similar Regional and International Qualifications. The comparisons are as detailed in the table below:


	<b>Botswana</b>	<b>SAQA</b>	<b>NZQF</b>
<b>Title</b>	Diploma in Systems Administration	Diploma in Information Technology in Network Design and Administration	New Zealand Diploma in IT Infrastructure with strands in Networking and Systems Administration
<b>Level</b>	NCQF Level 6	NQF Level 06	NZQF Level 6
<b>Credit Value</b>	361	370	120
<b>Entry Requirements</b>	Minimum entry requirement for this qualification is NCQF Level IV  Credit Accumulation and Transfer (CAT) and Recognition	<ul style="list-style-type: none"> <li>- National Senior Certificate.</li> <li>- National Certificate (Vocational) at NQF Level 4;</li> <li>- Senior Certificate, with Matriculation exemption</li> </ul>	NZ Diploma in IT Technical Support (Level 5) or equivalent knowledge, skills and experience.

	<b>BQA NCQF QUALIFICATION TEMPLATE</b>	Document No.	DNCQF.QIDD.GD02
		Issue No.	01
		Effective Date	04/02/2020

	<p>of Prior Learning (RPL):</p> <p>CAT and RPL Provisions shall be applied to allow candidates to start this qualification at a level that is consistent with the knowledge and skills gained from prior learning. This would be applied in relation to CAT and RPL policies in place.</p>			
<b>Structure</b>	<p>Local Area Networking;</p> <p>Network Security;</p> <p>Server Implementation;</p> <p>Wide Area Network Technology; PC Hardware and Software;</p>	<p>Networks (1A); Networks (1B);</p> <p>Computer Systems(1A);</p> <p>Computer Systems(1B);</p> <p>Databases (1A); Databases (1B);</p> <p>Principles of Project Management (1A&amp;B);</p> <p>Communication in the ICT environment (1A&amp;B); Work Integrated Learning; ICT Trends(3A&amp;B)</p>	<p>Virtualization;</p> <p>Emerging Technologies and Innovation;</p> <p>Internetworking with TCP/IP;</p> <p>Advanced network Security;</p> <p>Project Management; Enterprise Skills;; Cloud Computing Services;</p> <p>Directory Services; Business Continuity Services; Professional and Ethical Practices; Problem Solving; advanced Networking Configurations;</p>	

	<b>BQA NCQF QUALIFICATION TEMPLATE</b>	Document No.	DNCQF.QIDD.GD02
		Issue No.	01
		Effective Date	04/02/2020

	<p>Network Server Operating System; Network Services Administration; Network Infrastructure Analysis; Directory Services Administration.</p> <p>Linux Operating System.</p> <p>Cloud Computing; Work placement; Integrated Project; Supervisory Skills; Communication Skills; Entrepreneurship ; Project Management; Research Skills; Work Ethics and Professionalism</p>			
--	---	--	--	--

	<b>BQA NCQF QUALIFICATION TEMPLATE</b>	Document No.	DNCQF.QIDD.GD02
		Issue No.	01
		Effective Date	04/02/2020

This Three-year Diploma in System Administration Qualification is outstanding as it covers a wide range of currently applied knowledge and skills globally needed by the IT industry. It seeks to develop competencies in varying application platforms including server-based virtualization, directory services, network protocols and infrastructure, automated systems, application deployment and IT service management which make up the core knowledge and skills expected of someone working as an IT professional.

### **REVIEW PERIOD**

The qualification will be reviewed every five **(5) years** or as and when required depending on the changing needs of the market