

BQA NCQF QUALIFICATION TEMPLATE

SECTION A: QUALIFICATION DETAILS											
QUALIFICATION DEVELOPER (S)	Ed-Tech Africa										
TITLE	Diploma in Data Science and Analytics						NCQF LEVEL		6		
STRANDS (where applicable)	N/A										
FIELD	Information and Communication Technology						CREDIT VALUE		360		
SUB FIELD	Information Technology										
New Qualification	√		Legacy Qualification				Renewal Qualification				
							Registration Code				
SUB-FRAMEWORK	General Education				TVET		√		Higher Education		
QUALIFICATION TYPE	Certificate	I	II	III	IV	V	Diploma		√		Bachelor
	Bachelor Honours			Post Graduate Certificate				Post Graduate Diploma			
	Masters					Doctorate/ PhD					
RATIONALE AND PURPOSE OF THE QUALIFICATION											
<p>The rationale for this qualification is to address Botswana’s shortage of mid-level professionals in data science and analytics, as identified in the Human Resource Development Council (HRDC) Priority Skills and Prospects Reports (2019 & 2023). These reports list Data Science, Analytics, and Artificial Intelligence among the country’s top emerging and critical skill areas needed across sectors such as finance, agriculture, education, healthcare, and public administration.</p> <p>Currently, most organisations rely on imported expertise or unstructured short-term training to meet data-related needs. There is therefore a skills gap in developing local practitioners who can collect, clean, analyse, visualise, and interpret data for evidence-based decision-making.</p>											

This qualification is designed to fill that gap by providing a technical, hands-on diploma that equips learners with practical capabilities in statistics, programming, database management, data visualisation, and machine learning fundamentals. It contributes directly to national efforts under HRDC to promote digital transformation and employment creation within Botswana's knowledge-based economy.

The Diploma in Data Science and Analytics (NCQF Level 6) therefore supports Botswana's national digital-skills agenda, enabling graduates to contribute immediately in technical roles and to progress into advanced diplomas or bachelor's degrees in related fields.

Purpose:

The purpose of this qualification is to produce graduates with advanced knowledge, skills, and competence to:

1. Apply statistical and computing techniques to real-world data problems in business and public-sector environments.
2. Use industry-standard tools and languages (Python, SQL, Power BI) to transform raw data into actionable insights.
3. Uphold professional ethics, data privacy, and governance standards when handling sensitive information.
4. Collaborate effectively within multidisciplinary teams to support organisational data-driven decisions.

MINIMUM ENTRY REQUIREMENTS (including access and inclusion)

Minimal Entry Requirements

- Certificate IV (NCQF Level 4) and relevant subjects.
- Recognition of Prior Learning (RPL) - ETP shall consider RPL as an enrolment criterion in accordance with its RPL policy.
- Credit Transfer - ETP shall apply Credit Transfer as a method for enrolling candidates who hold certificates recognized by BQA, guided by the Credit Transfer policy.

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SECTION B QUALIFICATION SPECIFICATION	
GRADUATE PROFILE (LEARNING OUTCOMES)	ASSESSMENT CRITERIA
<p>1: Apply statistical techniques to interpret organizational data sets in sectors such as healthcare, agriculture, or retail.</p>	<p>1.1. Select and apply appropriate statistical methods (e.g., regression, probability) to real datasets from administrative or commercial domains.</p> <p>1.2. Use spreadsheet or statistical software (e.g., Excel, R) to compute summaries and derive insights.</p> <p>1.3. Interpret data outputs and make recommendations relevant to departmental objectives.</p> <p>1.4. Prepare written reports or dashboards that reflect the statistical reasoning and assumptions made.</p> <p>1.5. Identify data limitations and propose improvements to data collection or processing workflows.</p>
<p>2: Develop and manage data systems using spreadsheets and databases to support day-to-day operations in service-based organizations.</p>	<p>2.1. Design a relational database or spreadsheet layout suitable for daily transactions.</p> <p>2.2. Use functions or queries to extract relevant records (e.g., client lists, orders).</p> <p>2.3. Validate and clean inputs to prevent data entry errors.</p> <p>2.4. Automate simple tasks with formulas or scripts (e.g., inventory alerts).</p> <p>2.5. Backup and document the structure and logic of the system.</p>

<p>3: Use data science programming tools (Python or R etc) to clean and prepare raw datasets for analysis in applied work contexts.</p>	<p>3.1. Write code to import datasets in formats such as CSV, Excel, or SQL.</p> <p>3.2. Detect and handle missing, duplicate, or inconsistent values.</p> <p>3.3. Standardize column names, data types, and units for analysis readiness.</p> <p>3.4. Combine multiple datasets through joins or merges.</p> <p>3.5. Generate a clean summary report describing the preprocessing steps taken.</p>
<p>4: Generate data visualisations and dashboards to communicate insights to internal stakeholders in sectors such as finance or logistics.</p>	<p>4.1. Choose the right chart type (bar, pie, line) for each data insight.</p> <p>4.2. Use tools like Excel, Power BI, or Tableau to design interactive dashboards.</p> <p>4.3. Annotate visuals with clear titles, axis labels, and legends.</p> <p>4.4. Adapt dashboard layout to stakeholder needs (e.g., executive summary).</p> <p>4.5. Present visuals in a live or recorded walkthrough, explaining key findings.</p>
<p>5: Perform exploratory data analysis (EDA) to identify trends and inform workplace decisions.</p>	<p>5.1. Produce descriptive statistics and distribution plots (e.g., histograms).</p> <p>5.2. Identify correlations or group differences in variables.</p> <p>5.3. Detect anomalies or data quality issues.</p> <p>5.4. Summarise trends with sector-specific interpretations (e.g., sales cycles).</p> <p>5.5. Document findings in a brief workplace report or memo.</p>
<p>6: Apply data protection and ethical principles when handling personal or sensitive information in professional environments.</p>	<p>6.1. Identify personal and sensitive data in a given dataset.</p> <p>6.2. Anonymize or encrypt data using appropriate tools or methods.</p>

	<p>6.3. Adhere to relevant legal and organizational data privacy policies.</p> <p>6.4. Justify data use decisions ethically in written or oral communication.</p> <p>6.5. Maintain data access controls and log data-handling activities.</p>
<p>7: Support the design and testing of predictive models to address organizational forecasting or classification problems.</p>	<p>7.1. Prepare data for modelling (feature selection, train/test split).</p> <p>7.2. Select and justify the model type (e.g., linear regression, decision tree).</p> <p>7.3. Train models and evaluate their accuracy using appropriate metrics.</p> <p>7.4. Compare multiple models and document performance differences.</p> <p>7.5. Interpret the implications of model outputs for workplace action.</p>
<p>8: Document analytical processes and communicate results in a clear and structured manner to workplace stakeholders.</p>	<p>8.1. Maintain a version-controlled record of all data processing steps.</p> <p>8.2. Write a technical appendix with code explanations.</p> <p>8.3. Summarize results and implications in a stakeholder-friendly report.</p> <p>8.4. Use visuals and bullet points to improve communication clarity.</p> <p>8.5. Deliver an oral or slide-based presentation of key findings.</p>
<p>9: Collaborate within a multidisciplinary team to complete data projects on time and to standard.</p>	<p>9.1. Participate in planning meetings to define roles and timelines.</p> <p>9.2. Share tasks equitably and report progress through collaborative tools.</p> <p>9.3. Follow agreed protocols for data sharing and documentation.</p>

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9.4. Provide and accept constructive feedback on work contributions.

9.5. Submit joint deliverables by deadline, meeting client or supervisor requirements.

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SECTION C	QUALIFICATION STRUCTURE				
COMPONENT	TITLE	Credits Per Relevant NCQF Level			Total Credits
		Level [5]	Level [6]	Level [7]	
		FUNDAMENTAL COMPONENT Subjects/ Courses/ Modules/Units	Introduction to Data Science	12	
	Mathematics for Data Science I	12			12
	Introduction to Statistics	12			12
	Academic and Professional Communication	8			8
	Ethics and Data Privacy	8			8
	Data Governance and Quality Management		8		8
CORE COMPONENT Subjects'/Courses/ Modules/Units	Computer Programming (Python)		16		16
	Data Wrangling and Visualization		16		16
	Mathematics for Data Science II		12		12
	Database Systems		16		16
	Probability and Statistical Inference		12		12
	Machine Learning Fundamentals		12		16

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	Applied Linear Algebra		12		12
	Big Data Tools and Platforms		16		16
	Data Mining Techniques		16		16
	Natural Language Processing (NLP)		12		12
	Advanced Statistical Methods		12		12
	Capstone Project Proposal		8		8
	Industrial Attachment / Internship		40		40
	Advanced Machine Learning		16		16
	Capstone Project Execution		24		24
	Project Management for Data Projects		8		8
	Web and Cloud Data Technologies		16		16
	Introduction to Artificial Intelligence		12		12
	Domain-Specific Analytics (e.g., Health, Finance)		12		12
STRANDS/ SPECIALIZATION	Subjects/ Courses/ Modules/Units	Credits Per Relevant NCQF Level			Total Credits
		Level [5]	Level [6]	Level [7]	

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1.					
2.					
Electives	Entrepreneurship and Innovation in Data Science		12		12
	Time Series Analysis and Forecasting		12		12
	Cloud-Based Machine Learning (AWS/GCP)			12	12

SUMMARY OF CREDIT DISTRIBUTION FOR EACH COMPONENT PER NCQF LEVEL

TOTAL CREDITS PER NCQF LEVEL

NCQF Level	Credit Value
NCQF Level 5 Modules	52
NCQF Level 6 Modules	296
NCQF Level 7 Modules	12
TOTAL CREDITS	360

Rules of Combination:

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

Qualification Combination Rules Based on Module Status per NCQF Designation of Fundamental, Core, and Elective Modules entail that:

- (a) Elective modules, only one should be selected to make a total of 12 credits.
- (b) Compulsory core modules with a total of 296 credits
- (c) Fundamentals modules, which are also compulsory, with a total of 52 credits

To graduate, a candidate should have completed one elective module, done all core modules and fundamentals modules to attain 360 credits.

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ASSESSMENT ARRANGEMENTS

1.1. Assessment Arrangements

Learners shall be evaluated based on a summative and formative evaluation approach, which considers the attainment of qualification learning outcomes.

1.2. Assessment Strategies and Requirements.

- (a) All Assessments shall be compiled by ETP's lecturers who are BQA-accredited as assessors.
- (b) All assessors should have a General Degree in Data Science and Analytics or above, or a related qualification.
- (a) The contribution of assessment to the final module grade is 60% formative and 40% summative.

MODERATION ARRANGEMENTS

1.1. Moderation Arrangements

The following shall apply for both internal and external moderation following applicable ETP policies and regulations:

1.2. Appointment and Personnel Responsible for Internal and External Moderation

- Internal moderation shall be done by appointed and selected institution moderators, who are registered with BQA.
- External moderation shall be by moderators from other ETPs or the industry.
- External moderators should be accredited with BQA as moderators, having a General Degree in Data Science and Analytics or above or a related qualification or related areas.

RECOGNITION OF PRIOR LEARNING

There shall be provision for the award of credits towards this qualification through Recognition of Prior Learning (RPL).

CREDIT ACCUMULATION AND TRANSFER

There shall be provision for the award of credits towards this qualification through Credit Accumulation and Transfer (CAT) as per NCQF policy.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

1. Learning Pathways

Horizontal articulation of the qualification

- Diploma in Information Technology
- Diploma in Business Administration
- Diploma in Computer Science
- Diploma in Information Systems
- Diploma in Business Analytics
- Diploma in Cyber Security
- Diploma in Software Engineering
- Diploma in Electronic Commerce

Vertical articulation of the qualification

- Bachelor of Science in Data Science
- Bachelor of Science in Information Technology
- Bachelor of Business Administration (IT/Analytics stream)
- Bachelor of Science in Computer Science
- Bachelor of Science in Information Systems
- Bachelor of Science in Cyber Security
- Bachelor of Science in Business Analytics

2. Employment Pathways

Graduates of this qualification may work in occupations such as Data Analyst, Business Intelligence Technician, Database Administrator, ICT Specialist, Data Technician, and Research Assistant across public and private sectors.

QUALIFICATION AWARD AND CERTIFICATION

The qualification in Diploma in Data Science and Analytics is awarded to a candidate who must attain 360 credits to graduate. The following conditions for attaining credits for graduation should be fulfilled.

- Elective modules shall have a total of 12 credits
- Core modules for the qualification should contribute a compulsory minimum of 296 credits
- Fundamentals modules shall consist of compulsory and minimum of 52 credits
- Complete Industrial attachment

To graduate a person should have completed 360 credits

SUMMARY OF REGIONAL AND INTERNATIONAL COMPARABILITY

The following is a summary of the regional and international comparability.

1) Name of University and Country

The qualifications chosen for comparison were the Diploma in Data Science & Analytics from Zetech University (Kenya), the Diploma in Data Science (DDA) and Analytics from Ghana Communication Technology University (Ghana), and the Diploma of Data Science and Analytics from Cavendish University (Uganda)

2) Title of Qualification

All the qualifications compared have the same title with the developed qualification “*Diploma in Data Science & Analytics*”

3) NQF Level, Credit Value and Duration

Qualifications from Kenya and Uganda are at Level 6, however, the qualification from Ghana is at NTVETQF Level 5. However, these are considered similar in terms of depth and complexity because the Ghana curriculum covers advanced domains like Machine Learning and Big Data Technologies, which align with the requirements of NCQF Level 6.

4) Main Exit Outcome(s)

All the 3 Diploma programs share the developed qualification’s focus on applied data analysis, tools, and ethics; however, the *Diploma in Data Science & Analytics* for Zetech University differs by emphasizing entrepreneurship, for Ghana Communication Technology University by offering broader technical depth (ML and big data), and for Cavendish University Uganda by targeting foundational rather than advanced competencies.

5) Domains/ Modules Covered (Fundamental, Core & Electives)

All the 3 qualifications compared cover similar core areas (programming, statistics, ML, big data, visualization, and ethics) with the developed qualification, the latter’s curriculum is broader and more advanced.

6) Assessment Strategies and Weightings

The developed qualification uses the formative focused model, while the ones for Zetech University and Cavendish University Uganda emphasize continuous and project-based assessment, while that of Ghana Communication Technology University places greater weight on final examinations so the developed qualification utilizes a formative focused model to ensure continuous practical competency. This strategy was chosen over the exam heavy model of Ghana Communication Technology University to better align with the applied, project-based nature of data science roles in industry.

7) Qualification Rules (Minimum Standards for the Award)

The developed qualification is similar with the 3 compared qualifications on the entry requirement but differ on awards as it requires completion of 360-credits, while the other 3 qualifications focus minimum pass marks with less explicit credit and progression framework.

8) Education and Employment Pathways

All the 3 compared qualifications provide similar employment pathways like the developed qualification in data and analytics roles and allow progression to bachelor’s degrees, but Zetech emphasizes broader technical roles like Data Architect and Big Data Expert, while Ghana and Cavendish focus more on entry-level positions with strong industry readiness.

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Overall Conclusion

All 3 compared programs share strong similarities with the program described in the title, including NQF levels, core data science competencies, ethics, programming, assessment of applied skills, employment pathways, and progression to bachelor's degrees. There are minor differences in emphasis on entrepreneurship, technical depth, assessment models, and credit structures.

REVIEW PERIOD

Every 5 years, when a complete cycle of the qualification is completed, several alumni in the industry can also participate in the evaluation of the qualification.

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CODE (ID)			
REGISTRATION STATUS	BQA DECISION NO.	REGISTRATION START DATE	REGISTRATION END DATE
LAST DATE FOR ENROLMENT	LAST DATE FOR ACHIEVEMENT		