SECTION A:	QUALIFICATION DETAILS				
QUALIFICATION DEVELOPER	University of Botswana				
TITLE	Master of Arts in Statistics			NCQF LEVEL	9
FIELD	Natural, Mathematical and Life Sciences	SUB-FIELD	Statistics	CREDIT VALUE	245

New Qualification	✓	*Review of Existing Qualification*													
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

RATIONALE: Statistics, as a field, is high in demand by professionals in different fields such as Education, Business, Engineering, Natural, Mathematical and Life Sciences, Agriculture, Social Sciences etc., due to its potential applications in these fields. According to Human Resource Development Council (HRDC) 2019 report, data analysts and scientists and big data specialists are one of the future jobs in the global market driven by the fourth industrial revolution. Furthermore, Research, Innovation, Science and Technology (RIST) sector listed statisticians amongst top occupations in high demand in Botswana as they will assist the country to address research priority areas as outlined in VISION 2036 and National Development Plan (NDP11), (HRDC Report, 2016).

Master of Arts in Statistics qualification has been designed to provide a deep understanding of the modern statistical methods required to model and analyse data. The learners will benefit from thorough grounding in

the ideas underlying the statistical methods and develop skills in key areas such as statistical inference, practical data analysis, data modelling etc. The programme equips statisticians with skills needed for posts in industry, government, research, and teaching. The competencies gained through completion of this qualification also add value to economic development in an information-driven society where monitoring and evaluation are critical components.

PURPOSE:

The purpose of Master of Arts in Statistics is to produce graduate with the knowledge, skills, and competences to:

(i) Organise census, market surveys and opinion polls.

(ii) Apply advanced theory and methods of statistics needed to analyse and interpret data and write reports for projects.

(iii) Provide advisory and consultancy services, including the use of statistical software packages.

ENTRY REQUIREMENTS (including access and inclusion)

The minimum requirement for admission to the MA Statistics program shall be:

(i) NCQF level 8 (TVET/HE) or equivalent in statistics
(ii) Entry through Recognition of Prior Learning (RPL)

SECTION B	*QUALIFICATION SPECIFICATION*
GRADUATE PROFILE (LEARNING OUTCOMES)	***ASSESSMENT CRITERIA***
LO1 - Relate and critically apply probability theory as a mathematical discipline, to numerically measure the uncertainty of outcomes of an action or experiment with applications in commerce, health, sport, and industry	1.1. Assign relevant probability model to a specific experiment 1.2. Compute the likelihood that a given event will occur using a given probability model 1.3. Use probability in daily life to make decisions when one does not know for sure what the outcome will be. 1.4. Demonstrate the calculation of probabilities, moments and other related quantities based on given distributions 1.5. Demonstrate the application of the characteristic function- properties, inversion theorem, the laws of large numbers and central limit theorems. 1.6. Appraise the basic concept of measure theory and their applications.
LO2 – Conduct estimation, interpretation of results and report writing for projects	2.1 Adapt and develop competency in theoretical and applied statistics to work as a professional statistician 2.2 Perceive theoretical basis for statistical methodologies 2.3 Adapt the use of appropriate terminology in report writing 2.4 critically analyze and interpret data, build statistical models of real situations, and use programming tools and statistical software packages
LO3 - Provide advisory and consultancy services	3.1. Construct the client's inquiry as a statistical problem 3.2. Determine the appropriate statistical methods to address client's enquiry 3.3. Apply the knowledge in the discipline to real life problems from all sectors of society

LO4 - Adopt and/or innovate statistical tools and techniques to suit special problems.	4.1. Use various and appropriate statistical software to address socio-economic problems facing the society 4.2. Create or write own computing code to address a specialized statistical enquiry 4.3. Construct computer programs that address statistical research problems.
LO5 – Critically evaluate statistical techniques to point estimation, hypothesis testing and confidence sets.	5.1. Derive point and interval estimators of the parameters in statistical estimation. 5.2. Demonstrate and implement various approaches in hypothesis testing. 5.3. Develop a greater familiarity with a range of techniques and methods through a diverse set of theoretical and applied readings. 5.4. Model assumption checking, validity of models and goodness of fit of the models to the real data. 5.5. Develop a deeper understanding of the analysis of variance and decomposition of sum of squares in regression approach.

SECTION C	QUALIFICATION STRUCTURE				
FUNDAMENTAL COMPONENT *Subjects/ Courses/ Modules/Units*	**TITLE**	**Credits Per Relevant NCQF Level**			**Total** **(Per** *Subject/ Course/ Module/ Units)*
		Level [8]	**Level [9]**	**Level [10]**	
	Probability		25		25
	Statistical Inference		40		40
	Statistical Analysis		45		45
	Statistical Consultancy		15		15
	Research Treatise		30		30
OPTIONAL COMPONENT *Subjects/Courses / Modules/Units*	Any three courses from: Mathematical Methods for Statistics		15		15
	Advanced Statistical Computing		15		15
	Categorical Data Analysis		15		15
	Agricultural Statistics		15		15
	Economic Statistics and National Accounts		15		15
	Reliability and Life-testing		15		15

	Any three courses from:				
	Non-Parametric Inference		15		15
	Advanced Survey Sampling		15		15
	Time Series Analysis and Forecasting		15		15
	Medical Statistics		15		15
	Econometrics		15		15
	Education Statistics		15		15
	Advanced Probability Theory		15		15
	Advanced Stochastic processes		15		15
	Advanced Operations Research		15		15
	Selected Special Topics		15		15
ELECTIVE/ COMPONENT *Subjects/Courses / Modules/Units*					

SUMMARY OF CREDIT DISTRIBUTION FOR EACH COMPONENT PER NCQF LEVEL	
TOTAL CREDITS PER NCQF LEVEL	
NCQF Level	***Credit Value***
9	245
TOTAL CREDITS	245
Rules of Combination: ***(Please Indicate combinations for the different constituent components of the qualification)***	
For a student to graduate from this programme they must have acquired the following credits (Fundamental course 125 credits; Optional courses 90 credits and Projects 30 credits)	

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ASSESSMENT ARRANGEMENTS
5.1 Formative assessment Weightage: 50% **5.2 Summative assessment** The contribution of continuous assessment shall be 50%.
MODERATION ARRANGEMENTS
External Examiner: The person must be competent in the area of work to be examined, and an experienced researcher. Assessors and moderators should be BQA accredited and should follow ETP policy which is aligned with national/BQA policies.
RECOGNITION OF PRIOR LEARNING (if applicable)
RPL shall be applicable to gain credits towards the qualification as per BQA/ national policy on the same.
CREDIT ACCUMULATION AND TRANSFER
CAT policy shall be applied as per BQA/ national policy on the same.
PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)
The Masters of Arts in Statistics qualification provides career-path articulation options leading to a variety of horizontal articulation and vertical articulation as follows: **Horizontal Articulation** (related qualifications of similar level that graduates may consider) Graduates may consider pursuing related qualification for purposes of multiskilling, retooling such as: • Master of Business Administration • Master of Science in Biometry • Master of Science in Biostatistics

Vertical Articulation (qualifications to which the holder may progress to)

Graduate may progress to higher qualifications such as

- Master of Philosophy or Doctor of Philosophy in Statistics, NCQF Level 10.

Graduates will have requisite competencies and attributes to work as statisticians in all sectors of the economy be it private or public sectors.

The successful Master's degree holders can be absorbed into a:

- Senior managerial supervisory positions in the statistics divisions
- Statistical Consultants for a varied client base - Public and Private sectors such as Banks, Statistics Botswana, Ministry of Agricultural Development and Food Security, Ministry of Finance and Economic Development and many others.
- Academia in tertiary institutions and universities
- Researchers in research and academic based institutions

QUALIFICATION AWARD AND CERTIFICATION

Minimum standards of achievement for the award of the qualification
A student is required to achieve the 245 total credits inclusive of fundamental and optional components to be awarded the Masters of Arts in Statistics qualification.

Certification

Candidates meeting prescribed requirements will be awarded the Master of arts degree in Statistics.

REGIONAL AND INTERNATIONAL COMPARABILITY

Regionally, Master of arts degree in Statistics compares well with the University of Cape Town (UCT) Master's degree in Mathematical Statistics by dissertation. In UCT a candidate entering a Master's degree must have a BSc (Honours) degree or four-year undergraduate equivalent.

Internationally, the qualification compares well with the University of Sheffield MSc Statistics. The programme equips graduates with theories behind a variety of statistical techniques and apply them in

scenarios that professional statisticians face every day. The students take courses on Bayesian statistics, computational methods, machine learning, time series, sampling theory, etc.

The degree also compares well with the University of Kent MSc in Statistics. The courses offered are advanced regression modelling, Bayesian statistics, computational statistics, practical statistics and computing, principles of data collections and probability and classical inference. The courses offered at University of Kent have some similarities with those offered at UB.

REVIEW PERIOD

The program will undergo a review every 5 years.