SECTION A:	***QUALIFICATION DETAILS***																	
QUALIFICATION DEVELOPER (S)	University of Botswana																	
TITLE	Bachelor of Science in Mathematics of Finance															***NCQF LEVEL***	*7*	
FIELD	Natural, Mathematical and Life Sciences			***SUB-FIELD***	Mathematics and Statistics											***CREDIT VALUE***	*525*	
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:

Applied Mathematics is a major tool in supporting modern technology through its diverse applications. From communication technology to financial systems, mathematical modeling forms the invisible backbone of the modern world. Africa urgently needs its own human resources capacity in applied mathematical sciences if it is to successfully develop and thrive.

Africa faces some of the world's toughest development challenges in improving public health, education and stimulating economic growth. The key to finding solutions in Africa is to develop local and regional expertise. Skills in the mathematics of finance are crucial to investment and therefore crucial to economic growth. As such,

developing a strong mathematics of finance community is one of the highest priorities, yet with the lowest cost.

Mathematics of Finance is a branch of modern applied mathematics covering financial markets, investment strategies, financial risk measurement and analysis, derivatives structuring and pricing, among others. The field has a close relationship with the discipline of financial economics, which is also concerned with much of the underlying theory.

The financial sector in developing countries has been the reason why western countries have enjoyed an advantage over developing countries as governments in the industrialized countries have, in addition to taxation, alternative ways of raising finances to improve public services. Currently Botswana has around thirty banks, insurance companies and investment agents. This number does not include the insurance brokers. These institutions need mathematics of finance skills to provide better service. The financial sector has abundant employment opportunities for individuals possessing skills in mathematics of finance.

The qualification will meet Botswana's strategic goals of producing creative, competent and motivated professional graduates for the finance industry, and the private sector, who are capable of independent, critical and innovative thinking. It will contribute significantly to the following national strategic goals:

Fulfill the vision to expand access in ICT related programmes.
Contribute to the country's Vision 2036 and National Development Plan 11 (NDP 11) objectives with respect to the diversification of Botswana's economy and employment (NDP 11 Chapter 6).

PURPOSE:

The purpose of the Bachelor of Science (Mathematics of Finance) is to develop professionals who have knowledge, skills and competences to:

Demonstrate independent ability to carry original research in the field of Mathematics of Finance.
Solve identified national, regional, continental and global problems through modelling of real-life situations arising in the financial sector.
Demonstrate a sustained commitment to development of new ideas and processes in the financial sector.
Apply modelling and computational processes to solve real-life financial problems.
Provide financial leadership both in Government departments and the private sector.

ENTRY REQUIREMENTS (including access and inclusion)
Minimum entry requirement for this qualification: • NCQF level 4 (General Education) There will be provision for access through Recognition of Prior Learning system in accordance with relevant policies and guidelines at national and provider levels.

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SECTION B	***QUALIFICATION SPECIFICATION***
GRADUATE PROFILE (LEARNING OUTCOMES)	***ASSESSMENT CRITERIA***
1. Demonstrate wider knowledge and problem-solving skills in Mathematics of Finance.	1.1 Demonstrate a general understanding of the basic principles of mathematics, economics accounting and finance. 1.2 Demonstrate knowledge through analysis of different forms of economic and financial data. 1.3 Analyze different forms of economic and financial information.
2. Model financial problems in mathematical terms and use appropriate tools (methods and software) to solve them.	2.1 Apply acquired knowledge and skills to deal creatively with financial industry problems at analytical and conceptual levels. 2.2 Model real life economic and financial situations in mathematical terms. *2.3* Apply modelling and programming skills to solve industrial and or financial mathematics problems.
3. Demonstrate ability to carry out research in the area of Mathematics of Finance.	3.1 Formulate problems in mathematics of finance and conduct research. 3.2 Engage in research involving financial mathematics in industry. 3.3 Present and communicate findings in an organised manner.
4. Demonstrate ability to think in an analytical and organized manner, and to formulate mathematical arguments precisely and logically.	4.1 Formulate problems from finance and accounting in mathematical terms. 4.2 Select and/or *develop* appropriate numerical methods for solving problems in Financial Mathematics.

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SECTION C	***QUALIFICATION STRUCTURE***				
COMPONENT	***TITLE***	***Credits Per Relevant NCQF Level***			***Total*** ***(Per** Subject/ Course/ Module/ Units)*
		Level [5]	***Level [6]***	***Level [7]***	
FUNDAMENTAL COMPONENT *Subjects/ Courses/ Modules/Units*	Communication and Study Skills	***24***			***24***
	Computing and Information Skills Fundamentals	***16***			***16***
CORE COMPONENT *Subjects/ Courses/ Modules/Units*	Mathematical Analysis	***24***	***36***	***36***	***96***
	Algebra		***24***		***24***
	Probability & Statistics		***12***	***48***	***60***
	Mathematics of Finance	***24***	***12***	***12***	***48***
	Finance	***12***	***12***	***72***	***96***
	Accounting	***12***	***24***		***36***
	Economics	***24***	***24***		***48***

	Project & Industrial attachment			***29***	***29***
OPTIONAL COMPONENT *Subjects/ Courses/ Modules/Units*	Calculus of Variation and Control Theory			***12***	***12***
	Function of Complex Variables			***12***	***12***
	Mathematical Methods			***12***	***12***
	Optimization in Finance			***12***	***12***
	Financial Models			***12***	***12***
	Financial Institutions and Markets II			***12***	***12***
	International Business Finance			***12***	***12***
	Accounting Information Systems			***12***	***12***

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SUMMARY OF CREDIT DISTRIBUTION FOR EACH COMPONENT PER NCQF LEVEL	
TOTAL CREDITS PER NCQF LEVEL	
NCQF Level	***Credit Value***
5	***136***
6	***144***
7	***245***
TOTAL CREDITS	***525***

Rules of Combination:

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

The qualification requires **40** credits of fundamental courses, **437** credits of core courses and **48** credits of optional/elective courses. From the pool of Optional courses, the learner must choose **4** courses from itemised courses offered by the Departments of Mathematics and/or Accounting and Finance.

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ASSESSMENT ARRANGEMENTS
Assessment will consist of both formative and summative assessments. Assessment weightings will be as follows: • Formative Assessment : 50% • Summative Assessment: 50%. Assessment will be carried out by BQA registered and accredited assessors.
MODERATION ARRANGEMENTS
There shall be both internal and external moderation in line with the institutional policies in place for quality assurance purposes.
RECOGNITION OF PRIOR LEARNING
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.
CREDIT ACCUMULATION AND TRANSFER
Credit accumulation and transfer is applicable for this qualification.
PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)
Horizontal Articulation (related qualifications of similar level that graduates may consider) Bachelor of Science (Mathematics) Bachelor of Science (Computing with Finance) Bachelor of Science (Actuarial Science) Bachelor of Science (Operations Research)

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

Master of Science in Mathematics

MPhil in Mathematics

Master of Science (Actuarial Science)

Master of Science (Operations Research)

Master of Science (Financial Mathematics)

Employment Pathways

Financial modelers

Portfolio managers

Risk Modelers

Risk Analysts

Quantitative analysts

Financial Analysts

Actuarial Analysts

Investment Analysts

Financial Brokers

Financial advisors

QUALIFICATION AWARD AND CERTIFICATION

Qualification Award

To be awarded the Bachelor of Science in Mathematics of Finance qualification, a candidate is required to achieve a minimum of 525 credits.

Certification Award

Candidates awarded the qualification shall receive a certificate and an official transcript.

REGIONAL AND INTERNATIONAL COMPARABILITY

This BSc (Mathematics in Finance) Qualification is comparable to other similar BSc qualifications from around

the region (e.g., University of the Witwatersrand, South Africa) and the world with regards to outcomes and assessment criteria, degree of difficulty and notional learning time.

There is no directly comparable qualification regionally or internationally. However, the Bachelor's (BSc) degree in New Zealand is at Level 7 and is worth **360** credits. The BSc Honours Degree is at Level 8 and is worth 480 credits. Our BSc (Mathematics of Finance) is worth **525** credits and is thus comparable to the Bachelor's Degrees in New Zealand and some universities in South Africa.

The main difference is that in these other countries, their Bachelor's degree is 3 years whereas ours is 4 years. In these countries, entrance in the qualification is mostly at NCQF level 5 while for us is Level 4.

REVIEW PERIOD

The qualification will be reviewed after every 5 years.

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