QUALIFICATION SPECIFICATION							SECTION A
QUALIFICATION DEVELOPER	BOTSWANA ACCOUNTANCY COLLEGE						
TITLE	Bachelor of Science in Mobile and Web Technologies		**NCQF LEVEL**	7			
FIELD	Information and Communication Technology		**SUB-FIELD**	Mobile Technologies			
New qualification	✓		Review of existing qualification				
SUB-FRAMEWORK	General Education		TVET		Higher Education	✓	
QUALIFICATION TYPE	Certificate		Diploma		Bachelor	✓	
	Bachelor Honours		Master		Doctor		
CREDIT VALUE					485		

RATIONALE AND PURPOSE OF THE QUALIFICATION

RATIONALE

The arrival of the Fourth Industrial Revolution has shifted the way companies present information to their customers. Many customers prefer app and web-enabled markets as indicated by World Economic Forum (WEF). The study shows that the markets will be the second highest technology adoption by the year 2022 of 75% . As a result, the qualification has been designed to make students relevant for these coming changes and requirements of Jobs of the future. Students will be taught skills and abilities that will help them drive and influence the technological markets and so enable companies to stay relevant and competitive. The qualification will enable students to be innovative and develop analytical thinking stills, which will help companies make decisions using empirical statistical data. The qualification has been developed to tap into the emerging mobile technology domain within the African region and beyond, by equipping students with innovation skills, interpersonal skills and technological skills that enables students to build apps that integrate with organizational systems and cloud-based systems.

PURPOSE

The purpose of the Bachelor of Science in Mobile and Web Technologies is to:

- Equip learners with the necessary skills to use mobile technologies in a business and societal context by learning how to design, implement, support and evaluate a variety of mobile solutions for the enterprise and mobile customer.
- Produce graduates who are techno savvy in blending business and mobile technologies.
- Produce graduates who can take full advantage of ubiquitous Mobile and Web Technologies resources to foster business opportunities that create employment and contribute to economic growth.
- Produce graduates who can create business solutions from Mobile and Web Technologies and manage such solutions for future enhancements.
- Produce graduates who are competent in mobile software development through work-related learning and world experiences through corporate and community engagement.
- Produce graduates who can comfortably apply algorithmic thinking to problem solving.

ENTRY REQUIREMENTS (including access and inclusion)

Entry to this qualification is through <u>any one</u> of the following:

(a) Minimum entry level is NCQF Level 4 or equivalent, with a minimum of six (6) subjects passed. The subjects must include Math or Physics or Statistics with English, plus any other 4 subjects.

(b) **Recognition of Prior Learning (RPL)**

There will be access through Recognition of Prior Learning (RPL) and Credit Accumulation and Transfer (CAT) in accordance with the RPL and CAT National Policies.

QUALIFICATION SPECIFICATION	SECTION B
GRADUATE PROFILE (LEARNING OUTCOMES)	**ASSESSMENT CRITERIA**
LO1 Critically evaluate mobile and web technologies development solution strategies for business problems, implement and maintain them	1.1: Analyze an existing business and be able to design and develop computerized solution that can meet the business needs. 1.2: Apply project management techniques in delivering solutions for large ICT projects in the ICT industry. 1.3: Critically evaluate security strategies for business assets 1.4: Apply project management techniques to model, solve and deploy business solutions. 1.5: Apply logic and programming constructs in delivering business solutions.
LO2 Exhibit intellectual capability while working as an individual and in a group, indicating effective communication and professionalism.	2.1: Demonstrate Presentation and argument skills when putting across concepts. 2.2: Show Collaboration and interpersonal skills in self-expression. 2.3: Display professional Ethics and code of conduct all round. 2.4: Critically evaluate and discuss the application of a range of algorithms to solve more complex problems. 2.5: Participate in interdependent learning activity and function effectively as an independent learner.
LO3 Demonstrate ability to participate in constructive arguments on concepts, heuristics and theories encountered during learning time.	3.1: Reflect that learning is a cumulative process and must not learn to forget. 3.2: Argue concepts and theories in discussions. 3.3: Reflect on their own value systems, development and practices and compare these with alternative systems and practices. 3.4: Critically evaluate heuristics encountered in their studies.
LO4 Demonstrate and analyse ability to fully accomplish SDLC, testing, deployment of mobile web applications, conversion and support strategies for software development.	4.1: Apply appropriate techniques/development methodologies. 4.2: Communicate effectively by written, visual and oral means. 4.3: Use software development methodology principles to make decisions to use agile and other methodologies in projects. 4.4: Engage in creative problem solving that addresses student's individual needs and practice. 4.5: Appreciate the need to use code re-use in OOAD and not re-invent the software development wheel. 4.6: Analyse mobile web requirements with view to meet client solution needs.

	4.7: Integrate mobile and enterprise systems. 4.8: Secure web and mobile applications
LO5 Demonstrate ability to analyse, design, simulate and develop mobile networks in the business environment.	5.1 Apply appropriate techniques/analysis/simulation/development methodologies of mobile networks. 5.2 Ability to diagnose issues that may arise from a mobile network. 5.3 Manage and administer a mobile network in a business environment.
LO6 Compile, model and report on innovative work and produce an artefact.	6.1: Construct an artefact solution from research findings. 6.2: Model innovative ideas that address real life problems as found in industry. 6.3: Apply design heuristics in product development. 6.4: Model networks using digital signal processing like Fourier transforms. 6.5: Develop heterogenous mobile applications useable across different platforms.

QUALIFICATION STRUCTURE

SECTION C

	Title	**Level**	**Credits**
FUNDAMENTAL COMPONENT Subjects / Units / Modules /Courses	Introduction to Mobile Technologies	5	15
	Mobile Development Environments	5	20
	Systems Development	5	20
	Mathematics for Computing	5	20
	Computer Programming	5	20
CORE COMPONENT Subjects / Units / Modules /Courses	Innovation Project	6	20
	Web and Multimedia	6	20
	Database Design and Development	6	20
	Cross Platform Development for Mobile Applications	6	20
	Computer Networks	6	20
	Mobile Application Development	6	20
	Enterprise Mobile Application Development	6	20
	Modelling and Simulation of Mobile Networks	6	20
	Mobile and Web Security	6	20
	Industry Attachment	6	60
	Research (Dissertation)	7	30
	Advanced Mobile Application Development	7	20
	Product Development	7	20

	Applied Design and Development	7	20
	Android Mobile Development	7	20
	User Experience Design	7	20
	Telecommunications	7	20
	GRAND TOTAL CREDITS		**485**
ELECTIVE COMPONENT Subjects / Units / Modules /Courses	**No Electives**		

Rules of combinations, Credit distribution (where applicable):

The total number of credits at (level 5) = 95; (level 6) = 240 and (level 7) = 150. For this qualification, students will do all the modules. There are no electives. All modules are 20 credits each except for the Industry Attachment module which has 60 credits. A total of 485 credits must be completed to obtain the bachelor's degree.

ASSESSMENT AND MODERATION ARRANGEMENTS

ASSESSMENT ARRANGEMENTS

FORMATIVE ASSESSMENT (40%)

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

The contribution of formative assessment to the final grade shall be 40%.

SUMMATIVE ASSESSMENT (60%)

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

Assessment shall be carried out by BQA registered and accredited Assessors.

MODERATION ARRANGEMENTS

Moderation is done on all assessments that earn a student grade towards attainment of the qualification. It is two-fold covering internal and external moderation.

Internal moderation Arrangements

Internal moderation is done locally to uphold quality issues. It is done on all assessments that lead to the attainment of the qualification. It is done following an internal moderation instrument. Evidence of moderation will be in the form of moderation reports. Observations from the moderators are actioned by examiners to keep up with quality. After internal moderation is complete, external moderation takes place.

External moderation Arrangements

External moderation takes place after the internal moderation process has been completed. The External moderator moderates the assessment before and after its attempted. It is done following an external moderation instrument. In the latter case, the moderator is presented with a sample set of marks and a sample set of assessments. Due diligence, confidentiality and anonymity is practiced.

RECOGNITION OF PRIOR LEARNING (if applicable)

RPL and CAT will be considered towards the awarding of the qualification. RPL allows for the recognition of knowledge, skills and attributes acquired through formal and non-formal learning experiences. The Learning experience is evaluated to determine its validity and reliability when measured against the learning outcomes of a specific qualification, learning qualification for the purpose of recognition, and awarding the qualification.

Provisions are in place to accommodate appeal of the decisions; in the event the candidate chooses.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

LEARNING

a) **Vertical pathways**

Upon completion of the qualification graduates can progress into Bachelor Honors degree or Master's,
Master of Science in Computer Science,
Master of Science in IT
Master of Science in Mobile and Web Technologies.

b) **Horizontal**

Learners can progress horizontally across qualifications based on Credit Accumulation and Transfer (CAT). This implies that learners can progress to the same qualification that are in the same path e.g.

Bachelor of Science in Applied Business Computing,

Bachelor of Science in Computer Systems Engineering

Employment pathway

Upon completion, graduates can secure employment in various computing disciplines beginning at entry level point for the positions. They could venture into industry as,
Entrepreneurs,
Business analysts,
Android developers, and programmers.

They could further enhance themselves with professional bodies like SAP, CISCO, Huawei, Microsoft certifications.

QUALIFICATION AWARD AND CERTIFICATION

For a Candidate to achieve this qualification they must have acquired a minimum of **485** credits. The Candidate should pass all the **Fundamental and Core,** modules.

Certification

A **Bachelor of Science in Mobile and Web Technologies** will be awarded to a Candidate upon completion of the qualification in accordance with applicable policies. A certificate and transcript will be issued at award.

REGIONAL AND INTERNATIONAL COMPARABILITY

International Benchmarking

The qualification was developed with a focus to equip graduates with top level skills in Mobile and Web Technologies. The qualification was informed by the BSc Mobile and Web Technologies qualification from University of Sunderland in general. Internationally the qualification is considerably underpinned to University of Sunderland. The comparisons made in this qualification is against BSc (Hons), which is what most institutions offer. There has not been any BSc qualifications found for international benchmarking. The qualifications have been meticulously named as a way of explicitly outlining the domain areas that the qualifications are targeting. A comparison against 3 institutions has been made and outlined. The assessment criteria for the qualifications has not been outlined in the comparison as most institutions have been silent on it. Learning outcome comparison has been provided where possible. The qualification was developed following the requirements of QA associations such as BQA and QAA to ensure that the skills graduates develop are relevant.

Comparison with BSc (Hons) Web & Mobile Development (University of Suffolk UK)

University of Suffolk, in the UK, offers a similar qualification called BSc (Hons) Web & Mobile Development. The qualification runs for 3 years without any top up at University of Suffolk. There is 62.5% similarity on the modules being offered between the two institutions. The difference of 37.5% is due to the industries that where these two-qualification run. BSc Web & Mobile Technologies introduces students to the basic fundamentals in mobile application development while University of Suffolk has very little emphasis on these foundation modules. Core modules that teach students about developing applications the same application that run in different platforms has been left out by University of Suffolk.

Comparison with BSc (Hons) Web and Mobile Development (University of West of Scotland)

Another UK based university called University of the West of Scotland offers a similar qualification called BSc (Hons) Web and Mobile Development. The names are similar to that offered in University of Suffolk. The qualification has been crafted to meet the requirements of the British Computing Society [8]. The qualification runs for 6 years full-time or 8 years part-time, with 3 modules at each semester. This is a common trend with UK qualifications. The learning outcomes of the qualification have been designed to be very practical, with much focus on programming and problem solving. The qualification defines learning outcomes for each level. Learning outcomes from this qualification have been clearly covered by several other learning outcomes from the qualification of University of West Scotland. The qualification follows the same tune and structure as far as knowledge dissemination is concerned. BSc Web and Mobile Technologies goes further to cover mobile networks, which is not covered in University of West Scotland. University of West of Scotland has more modules running as it takes a longer time (6 years) compared to the 3 years we have running. Some of the levels have optional modules to choose from.

Comparison with BSc (Hons) Computing (Mobile Application Development) University of Northampton

This qualification runs for 3 years with 3 modules per semester. The qualification covers a diverse range of mobile platform that users interact with.

There is 69% module similarity between the qualifications. BSc (Hons) Computing (Mobile Application Development) has 31% module difference which is due to the different industries targeted by the qualifications.

Regional Benchmarking

There has not been any qualification found within the region that can be comparable to BSc Mobile and Web Technologies. This may be due to the fact that mobile technologies are relatively new in the region and thus have not gained popularity.

REVEW PERIOD

The qualification shall be reviewed after five years upon registration or as and when the need arises.