QUALIFICATION SPECIFICATION SECTION A						
QUALIFICATION DEVELOPER	BOTSWANA UNIVERSITY OF AGRICULTURE AND NATURAL RESOURCES					
TITLE	BACHELOR OF SCIENCE IN AGRICULTURE			**NCQF LEVEL**	7	
FIELD	AGRICULTURE AND NATURE CONSERVATION		**SUB-FIELD**	AGRICULTURE		
New qualification		Review of existing qualification				
SUB-FRAMEWORK	General Education		TVET		Higher Education	√
QUALIFICATION TYPE	Certificate		Diploma		Bachelor	√
	Bachelor Honours		Master		Doctor	
CREDIT VALUE					516	

RATIONALE AND PURPOSE OF THE QUALIFICATION

Rationale

Under NDP10 which covered the period 2009 to 2016, the Botswana Agriculture sector, under the Economy and Employment Thematic Area (Outcome 1: Diversified Economy) contributed only 3.6% to GDP with an average value-added growth rate of -0.1%. The main contributing factors to poor performance of the sector at production level were, among others, outbreaks of pests and diseases, prolonged droughts and extreme weather as a result of climate change and aging farmers with low levels of education not practicing basic agronomic principles such as timely weeding and application of fertilizers and pesticides. At value chain level, poor infrastructure such as roads, water, electricity, markets, and food processing

plants led to poor production capacity despite interventions such as the National Master Plan for Arable Agriculture and Dairy Development (NAMPAADD) and Integrated Support Programme for Arable Agriculture development (NDP11). In NDP11 the government aims to improve infrastructure for agriculture and support further development of value chains in beef, horticulture, dairy, piggery, goat, poultry and leather. For increased production and success of envisaged value chains, there is need to have well trained human resources to be farmers and agro-entrepreneurs and the Bachelor of Science in Agriculture graduates will form the core of the farmers and entrepreneurs.

A review of the Bachelor's qualification was carried following a needs assessment and resulted in the subsequent and gradual development and introduction of Bachelor's qualifications in Animal Science (Ruminant and Non-ruminant streams), Crop Science (Agronomy and Horticulture streams), Agricultural Mechanization, Soil and Water Conservation Engineering, Agricultural Extension and Food Science and Technology in addition to the original general Agriculture qualification.

The Bachelor of Science in Agriculture qualification produces non-specialist graduates with a broad range of agricultural aspects such as crop and animal production, economics and mechanization. Such non-specialist graduates have an important role to play in the private, non-governmental and governmental sectors as farm managers, extension officers and entrepreneurs. In addition, the introduction of integrated farming in 2013 following the Presidential Directive Cab 2(B)/2013 - Introduction Of Integrated Farming In Agricultural Land justifies the qualification.

The Human Resources Development Council (HRDC) in 2016 listed top occupations in high demand for the various sectors. For the Agricultural sector the occupations in high demand relevant to the BSc in Agriculture qualification are those of farm managers and producers.

The Bachelor of Science in Agriculture qualification is aligned to ND11 which, among others, calls for the review of curriculum to improve relevance and quality of education through a shift from content-based to outcome-based curriculum and emphasis on technology, business and vocational skills that are essential to the needs of the economy (NDP11). The Bachelor of Science in Agriculture qualification will also continue to contribute to the improvement of transition rates from secondary to tertiary which is 21.3% The Bachelor of Science in Agriculture qualification is also aligned to Vision 2036 Pillars 1: Sustainable Economic Development and 2: Human and Social Development. It is envisioned that the agricultural sector

if well supported, will have a positive impact on the livelihoods of the majority of the population which lives in rural areas. Hence the vision is “Our country will have a sustainable, technology-driven and commercially viable agriculture sector” (Vision 2036). The country envisions developing a disease-free agriculture sector that optimizes use of land, utilizing technologies and modern farming methods to improve productivity and fostering development of private sector-led value chain activities in production, processing, marketing and distribution. To achieve this, there is need for a new and visionary agri-entrepreneur able to embrace new agricultural technologies and capable of innovation at the farm level and the Bachelor of Science in Agriculture graduate will be a key part of the solution. For Pillar 2 the Nation envisions that “Botswana society will be knowledgeable with relevant quality education that is outcome-based with an emphasis on technical, vocational skills as well as academic competencies (education with production)”. The Bachelor of Science in Agriculture qualification will contribute towards a knowledge economy and the graduates will be “internationally competitive, productive and creative with international exposure” which, should the need arise, emigrate and work regionally and internationally.

Purpose of the Qualification

The purpose of this qualification is to:

(i) Develop graduates with experiential learning skills for growing crops and rising livestock in a profitable and sustainable manner

ii) Equip graduates with skills to plan and execute research, critically evaluate results and disseminate findings

(iii) Train graduates in the identification of constraints to crop and animal health, formulate and apply appropriate interventions for optimal growth of crops and animals

(iv) Develop graduates with critical entrepreneurial skills and competencies for proposing and successfully executing agribusiness

(vi) Impart the knowledge, skills and attributes needed by graduates to develop agricultural communication and extension packages for farmers and other stakeholder

(vii) Equip graduates to operate at a substantial level of responsibility and accountability in implementing appropriate government policies and other instruments related to agriculture

ENTRY REQUIREMENTS (including access and inclusion)
Entry to this qualification is through any of the following: • NCQF Level IV, or its equivalent, with passes in Biology, Chemistry, Physics, Mathematics and English Language. • Recognition of Prior Learning (RPL) and CAT policies shall apply in accordance to institutional and the national RPL policy.

QUALIFICATION SPECIFICATION SECTION B	
GRADUATE PROFILE (LEARNING OUTCOMES) **At the end of the qualification students will be able to:**	**ASSESSMENT CRITERIA**
1. Assess crop resources and identify those suitable for growing in various environments	1.1 Assess priorities in small-scale and commercial crop production and recommend them for various agro-ecological zones 1.2 Assess and recommend appropriate crop varieties and associated technologies for production in various agro-ecological zones of Botswana
2. Assess livestock resources and identify those suitable for raising in various environments	2.1 Determine priorities in small-scale and commercial livestock production for various agro-ecological zones

	2.2 Assess and recommend appropriate livestock species and stocking densities for production in various agro-ecological zones of Botswana.
3. Establish and manage an agribusiness profitably	3.1. Conduct a market survey for establishment of a viable small-scale or commercial livestock or crop production enterprise 3.2. Apply knowledge and skills to establish and profitably run a small-scale or commercial crop or livestock enterprises 3.3. Demonstrate leadership capabilities and organization of appropriate staff development activities in an institution or business.
4. Advise small-scale and commercial farmers and other stakeholders on best practices for crop and animal production	4.1. Package extension materials or technologies for farmers 4.2. Effectively communicate extension messages to small-scale, commercial farmers and other stakeholders 4.3. Apply appropriate extension methods and establish demonstrations to support farmer practices of raising livestock and growing crop profitably
5. Execute government policies related to the agriculture sector	5.1. Use appropriate legislation and government policies in decision making at the workplace 5.2. Apply and implement appropriate policies and guidelines in execution of duties

6. Recommend environmental-friendly management measures for animal and crop pests to enhance productivity	6.1. Identify of common pests and diseases of crops and livestock on the farm 6.2.Recommend soil management technologies to farmers 6.3. Assess and recommend appropriate control measures for crop and livestock pests and disease
7. Manage soil and range resources in a sustainable manner to enhance livestock and crop productivity.	7.1 Assess and recommend appropriate livestock stocking densities to minimize range degradation 7.2. Recommend appropriate soil use and conservation methods for optimal crop production
8. Utilize ICT to access and apply scientific knowledge to advance all aspects of sustainable commercial agriculture	8.1. Acquire information from the internet and other ICT resources for use in crop and animal production and value-addition processes 8.2. Utilize ICT resources in preparation and presentation of reports and other official documents

QUALIFICATION STRUCTURE

SECTION C

FUNDAMENTAL COMPONENT Subjects / Units / Modules /Courses	Title	Level	Credits
	Mathematics	5	24
	Chemistry	5	24
	Physics	5	24
	Biology	5	24
	Basic Computing	6	24
	Communication skills	6	16
CORE COMPONENT Subjects / Units / Modules /Courses	Introduction to Agricultural economics	6	8
	Agribusiness development and management	7	36
	Agricultural policy and extension	7	28
	Genetics	6	8
	Statistics, data analysis and presentation	7	28
	Principles Animal production	6	48
	Principles of crop production	7	48
	Soil science	6	12
	Industrial experiential training	7	24
	Field and horticultural production	7	24
	Farm workshop and farm implements	7	20
	Crop pest management	7	36
	Research Project	7	16
ELECTIVE COMPONENT Subjects / Units / Modules /Courses	Elective Group 1. **Surveying and water conservation** (choose 1 from this group)		
	Land Surveying and Evaluation	6	12
	Soil and Water Conservation	6	12
	Soil-Plant-Water Relations	6	12
	Elective Group 2. **Farm and irrigation structures** (choose 1 from this group)		
	Farm Structures	7	12
	Design of Irrigation Systems	7	12

	Elective Group 3. **Non-ruminant animal production** (choose 1 from this group)		
	Poultry production	7	12
	Pig and rabbit Production	7	12
	Elective Group 4. **Ruminant animal production** (choose 1 from this group)		
	Sheep and Goat Production	7	8
	Beef Production	7	8

Rules of combinations, Credit distribution (where applicable):

Candidates are required to do all Subjects / Units / Modules /Courses from fundamental and core components. **To make up the elective credits required for the award of the qualification, candidates are required to do 44 credits comprising 12 credits from each of the first three elective groups and 8 credits from the last elective group.**

The qualification credit distribution will be as follows:

	Credit distribution				
Level	Core	Fundamental	Elective	Total	
5	0	96	0	96	
6	76	40	12	128	
7	260	0	32	292	
Total	336	136	44	516	

ASSESSMENT AND MODERATION ARRANGEMENTS

ASSESSMENT ARRANGEMENTS

Assessment will include both formative and summative modes. The summative and formative assessments will each contribute 50% of the overall grade

MODERATION ARRANGEMENTS

There will be provision for internal and external moderation as a quality assurance measure. Both the internal and external moderators must be registered with BQA as moderators and assessors.

RECOGNITION OF PRIOR LEARNING (if applicable)

Recognition of Prior Learning, RPL and Credit Accumulation and Transfer will be applicable and considered for award of this qualification. Assessment for RPL shall be done as per the individual ETP policy in line with the national policy on RPL.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Learning progression Pathways

Enrolled learners of this qualifications may **Horizontally Articulate** to any of the following:

i. Bachelor of Science in Crop Science at NCQF Level 7
ii. Bachelor of Science in Wildlife Management at NCQF Level 7
iii. Bachelor of Science in Range Sciences at NCQF Level 7
iv. Bachelor of Science in Biological Sciences at NCQF Level 7

Holders of this qualification may **Vertically Articulate** to any of the following:

i. Post-Graduate Certificate in Agriculture at NCQF Level 8
ii. Bachelor of Science (Honours) in Agriculture, at NCQF Level 8
iii. Post Graduate Diploma in Agriculture, at NCQF Level 8
iv. Master of Science in Crop Science at NCQF Level 9

Employment Pathways

Bachelor of Science in Agriculture graduates can be employed as:

i. Agricultural Research Officers
ii. Biosecurity Officers
iii. Lecturers in tertiary institutions
iv. Charity administrators (e.g. in National Trusts)
v. Extension Officers
vi. Secondary School Agriculture teachers
vii. Agricultural field technicians
viii. Farm managers

The graduates can set up their enterprises such as farms, agrochemical retailers and consultancy firms .

QUALIFICATION AWARD AND CERTIFICATION

Graduates shall be awarded **a Bachelor of Science in Agriculture** upon obtaining a minimum pass mark of 50% or more in a course/module and attaining a total of **516 credits**, and having satisfied the rules of combination.

On attainment of the qualification and certification the graduates should be able to demonstrate knowledge, skills and attitudes required to perform effectively in agriculture and related fields. All the learning outcomes should be met for the award of the qualification.

REGIONAL AND INTERNATIONAL COMPARABILITY

This generic Bachelor of Science qualification is comparable to other similar level 7 qualifications nationally, regionally and internationally with regards to exit-level earing outcomes, assessment criteria, degree of difficulty and notional learning time. There is no national ETP that offers BSc Agriculture qualification, hence, for purposes of comparability only regional and international bench marking was done. In general, very few agricultural higher education institutions are offering qualifications in general agriculture since the trends has been to produce specialists in animal, crop and soil sciences.

The BSc in Agriculture qualification compares with those from two (2) regional universities (University of Limpopo (UL), South Africa and Sokoine University of Agriculture (SUA), Tanzania) and one international university (University of Adelaide (UA, Australia). The detailed comparability matrix is appended.

This BSc in Agriculture qualification is comparable to both the regional and international qualifications in terms of:

1. Structure of qualification

All three qualifications cover animal and crop production with supporting courses/modules/units from agricultural engineering, soil science, agricultural economics and extension with fundamental science and mathematics courses but differ slightly in which course/units/modules are core and elective. All qualifications have a component of industrial/field attachment.

2. Duration and total credits of qualification

The main difference with our qualification is the duration of four (4) years with a total minimum credits of 480 whereas all three are for three years and 360 credits (UL and SUA) or 72 units (UA). The main reason for the difference in duration is that our candidates join the university after O-Levels as opposed to A-Levels for the other Universities.

3. Assessment

Assessment for the modules/courses/units are similar in that both formative and summative forms of assessment are used with each contributing 50%.

REVIEW PERIOD

The qualification will be reviewed every 5 years