BQA NCQF Qualification Template

DNCQF.FDMD.GD04 **Issue No.: 01**

QUALIFICATION SPECIFICATION								**SECTION A**
QUALIFICATION DEVELOPER	Botswana University of Agriculture and Natural Resources							
TITLE	Bachelor of Science in Horticulture				**NCQF LEVEL**	7		
FIELD	Agriculture and Nature Conservation		**SUB-FIELD**	Horticulture				
New qualification	✓	Review of existing qualification						
SUB-FRAMEWORK	General Education		TVET		Higher Education	✓		
QUALIFICATION TYPE	Certificate		Diploma		Bachelor	✓		
	Bachelor		Masters		Doctor			
CREDIT VALUE	528							

RATIONALE AND PURPOSE OF THE QUALIFICATION

Rational

According to the Human Resource Development Council of Botswana (HRDC) human resource development plan under agriculture sector committee, agriculture is the main source of livelihood in Botswana as 40% of the population lives in rural areas and derive their subsistence from crop production and related agricultural activities (https://www.hrdc.org.bw/?q=sector-committees). However, crop production in Botswana is severely hampered by low and erratic rainfall, endemic droughts, high summer temperatures, low soil fertility and high incidence of pests, diseases and weeds. Lack of technology adoption by farmers, poor research-extension linkages and limited human resources have also been blamed as contributing to poor performance of the crop sector. The need for Crop Scientist equipped with adequate knowledge and skills to serve the emerging crop sector in Botswana is strong. A country-wide needs assessment survey was conducted in February and March 2003. An overwhelming majority of the respondents (96.9%) indicated that they require graduates in Crop Science in their organizations and therefore requested that the Department of Crop Science and Production should introduce the proposed BSc Crop Science. The streams in Agronomy and Horticulture were designed to provide specialized knowledge in field and horticultural crop production, respectively. Special emphasis has been placed on production of cereals, legumes and oilseeds, fibre and industrial crops, root and tubers as well as fruits, vegetables, ornamentals, controlled environment horticulture and irrigation. Also, according to the HRDC's agricultural sector plan, there is the need for human capital and skills development for technology transfer to raise the productivity of both small- and large-scale farmers. There is also the need to improve the quality of the agricultural training by improving its relevance and practical training component to produce, among others, agronomists, breeders and horticulturalists; these have been identified as occupations in high demand in Botswana. Furthermore, among the six broad basis of the National Development Plan 11 (NDP 11) are human capital development and sustainable use of natural resources which this qualification will also address. Graduate of this qualification further advance Vision 2036 pillars of Sustainable Economic Development, Human and Social Development and Sustainable Environment.

Purpose

The purpose of the qualification is to produce graduates who are skilled in horticulture to be able to drive change that can lead to increased horticulture crop productivity in conditions of Botswana, be industry ready and can be self-employed. Horticulture enterprise management, conduct elementary trials and research in horticulture, operate municipal landscapes/parks, advice horticulture farmers/practitioners.

Graduates of this qualification will be able to do the following.

- Plan and execute research studies and demonstrations in the area of crop production

• Apply strategies such as climate smart agriculture to mitigate effect of global climate change on crop production • Design and apply pest management programs to manage pests, disease and weed to improve crop production.
ENTRY REQUIREMENTS (including access and inclusion)
• Minimum entry is Certificate IV (NCQF Level 4) or BGCSE equivalent • Candidate not meeting minimum requirement will be admitted through RPL and CAT

QUALIFICATION SPECIFICATION **SECTION B**

GRADUATE PROFILE (LEARNING OUTCOMES)	ASSESSMENT CRITERIA
1. Assess bio-resources and identify crops suitable for growing in various environments.	1. Identify and assess the bio-resource potential of Botswana and make recommendations for their suitability for different crops and cropping systems 2. Advice Government, farmers and other stakeholders on crop suitability for various parts of the country
2. Identify and utilize appropriate information and communication technology in horticulture operations	1. Apply computer technology for storage and analysis of data, written and graphic works, as well as presentations
3. Plan and execute research studies and demonstrations in the area of crop production	1. Carryout scientific experiments 2. Communicate scientific information generated from the research work
4. Identify and apply sustainable management practices to manage horticultural crop production operations	1. Design long term cropping systems and field practices to produce field, industrial, horticultural and forage crops on a sustainable basis. 2. Explain concepts of sustainable agriculture concepts applicable to horticultural crop production
5. Formulate, interpret and execute relevant Government policies and Acts related crop production.	1. Craft policies and programs to promote sustainable production 2. Explain Government policies aimed at improving farmers crop productivity
6. Design and operate controlled environment crop production systems to improve crop productivity	1. Describe different controlled environment systems like greenhouses, tunnels and hydroponics for both large- and small-scale crop production
7. Draw and apply strategies such as climate smart agriculture to mitigate effect of global climate change on crop production	1. Explain climate smart crop production practices.
8. Design, establish and manage agribusiness profitably	1. Draw agribusiness/enterprise business plans 2.
9. Design and apply pest management programs to manage pests, disease and weed to improve crop production.	1. Identify the major pests, diseases and weeds that constrain crop production 2. Apply suitable and appropriate control measures of these pests and diseases to enhance crop yield on a sustainable basis

10. Manage soil in a sustainable manner, to enhance crop production	1. Sample soil for do laboratory analyses for physical and chemical properties 2. Calculate fertilizer application for supply of nutrients and other soil amendments to increased crop yields and quality
11. Advice farmers on appropriate practices of growing crops to obtain economic yields	1. Explain extension principles and methods to impart crop production knowledge farmers
12. Manage human resource in organization of interest	1. Explain principles of human resource management
13. Establish and manage large- and small-scale field and horticultural crop production enterprises profitably	1. Describe appropriate land preparation technology for crop growing 2. Identify suitable crop planting methods to establish effective crop stands 3. Calibrate and use farm implements like planters, sprayers, soil cultivating equipment
14. Prepare post-harvest handling operations to preserve produce shelf life	1. Describe post-harvest handling techniques to preserve quality of produce

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
	Computer Skills	6	16
	Communication Skills	6	24
CORE COMPONENT Subjects / Units / Modules /Courses	Genetics and plant breeding	6	16
	Biometry	7	16
	Biochemistry	7	8
	Soil Science	6	24
	Crop Protection	6	24
	Agricultural Economics, Extension and Agribusiness	8	28
	Crop Production	7	24
	Industrial Attachment	8	24
	Farm mechanization and irrigation	7	24
	Research Project	8	16

QUALIFICATION STRUCTURE			SECTION C
CORE COMPONENT Subjects / Units / Modules /Courses	**Title**	**Level**	**Credits**
	Plant Biology and Propagation	7	24
	Soil Plant Relationships	7	12
	Horticulture Crop Production	7	36
	Pests and diseases of Horticultural Crops	7	12
	Ornamental Horticulture	8	24
	Postharvest Physiology and Technology	8	12
ELECTIVE COMPONENT Subjects / Units / Modules /Courses	**Optional set 1**		
	Biosystems and Agricultural Engineering	6	24
	Animal Sciences	6	24
	Optional set 2		
	Food Science and Technology	7	24
	Agronomy	7	24
	Optional set 3		
	Agriculture, Economics	8	20
	Education and Extension	8	20
	Biodiversity and Natural Resources	8	20
	Total Elective credits		**68**

Rules of combinations, Credit distribution (where applicable):

Rules of Combination

Fundamental (F) + Core (C) + Elective (E)
= 136 + 324 + 68
= 528

Core = 324 = 61.36%
Fundamentals = 136 = 25.76%
Elective = 68 = 12.88%

Credit Distribution for Horticulture stream

Level	Total Credits
5	96
6	128
7	180
8	124
TOTAL	528

ASSESSMENT AND MODERATION ARRANGEMENTS

ASSESSEMENTS

- The Formative is 50%
- The summative assessment is 50%
- Assessment will be carried out by BQA accredited assessors

INTERNAL AND EXTERNAL MODERATION

Internal and external moderation will be carried out by BQA accredited moderators

Assessment and moderation will be carried in accordance with institutional policies in line with the national policy.

RECOGNITION OF PRIOR LEARNING (if applicable)

There will be provision for award of the qualification through RPL and CAT
RPL will be carried in accordance with institutional policies in line with the national policy.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Horizontal Progression

Bachelor of Science in Agriculture,
Bachelor of Science in Agricultural Extension
Bachelor of Science in Agronomy

Vertical Progression

Bachelor of Science Honours in Agriculture,
Bachelor of Science Honours in Agricultural Extension
Bachelor of Science Honours in Agronomy
Master of Science in Horticulture
Master of Science in Agronomy,
Master of Science in Soil Science
Master of Science in Plant Health

Employment Pathways

Horticulture Scientific Manager
Horticulture Research Officer
Horticulture Marketing Manager
Horticulture Entrepreneur Manager

QUALIFICATION AWARD AND CERTIFICATION

- Graduates will be awarded Bachelor of Science in Horticulture after obtaining attaining a minimum of 528
- There will be issuance of a certificate and transcript at award
- There is provision for award of the qualification through RPL and CAT

REGIONAL AND INTERNATIONAL COMPARABILITY

The qualification is comparable to similar ones offered in the SADC region and beyond based on content and credit requirements.
Benchmarking for the Bachelor of Science in Horticulture was done with regional and international universities. Nationally, there are no universities offering this qualification. Comparisons were done using the qualification name, the credit load, the duration of study, the qualification structure as well as the entry requirements with the following universities: University of Venda in South Africa and University of Guelph in Canada. This qualification is at par with the qualifications offered by the universities used in the comparative study.

The university of Venda offers a similar degree but with a lesser credit value 480 compared to 528 allocated to this proposed qualification, hence, compares highly. The University of Guelph in Canada runs a similar qualification although it did not indicate credit value but looking at modules offered, the two qualifications are at par. University of Guelph qualification is four years like the qualification proposed.

REVIEW PERIOD

The qualification shall be reviewed every 5 years