

BQA NCQF QUALIFICATION TEMPLATE

SECTION A: QUALIFICATION DETAILS																			
QUALIFICATION DEVELOPER (S)			Botswana University of Agriculture and Nature Conservation																
TITLE		Doctor of Philosophy in Agronomy								NCQF LEVEL		10							
STRANDS (where applicable)		1. Field Crops 2. Horticultural Crops 3. Soil Science 4. Crop Breeding																	
FIELD		Agriculture and Nature Conservation								CREDIT VALUE		360							
SUB FIELD		Crop Production																	
New Qualification		✓		Legacy Qualification						Renewal Qualification									
										Registration Code									
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: Higher education plays a crucial role in the economic and social development of a country; thus, it is not accidental that the most developed nations of the world produce the highest number of PhD scholars (OECD, 2018). The USA is leading in this aspect, and no African country appears in the top 10 countries that produce the highest number of PhDs. In a study conducted by the British Council and the German Academic Exchange Service (DAAD), it was found that all countries in Sub-Saharan countries needed to significantly expand their pool and increase their rate of production of PhD graduates.																			

According to the 2022 census, the population of Botswana that lives in rural areas is about 30%. They derive their subsistence from crop production and related agricultural activities (Statistics Botswana, 2022). Lately, a good number of urban/peri-urban people have entered arable agriculture after the closure of borders between Botswana and South Africa with respect to the importation of fruits and vegetables. The importation bill for food, including grains, is over 2 billion BWP. To reduce this amount, it will take dedication to train future workers with the necessary skills and competencies to catapult the country forward in terms of food and nutrition security. The agriculture sector has multiple backward and forward linkages to other sectors of the economy, such as input services, transport, manufacturing, advisory services, financial services, and tourism. Thus, improving this sector will spill onto others and develop the whole value chain. However, constraints to increased crop production in Botswana include low and erratic rainfall, endemic droughts, high summer temperatures, low soil fertility and high incidence of pests, diseases, and weeds, low mechanisation and automation rates (low adoption of technology). Furthermore, inadequate research-extension linkages and limited highly trained and skilled human resources are key challenges. To overcome these constraints, the country requires highly skilled specialised trained crop production (field crops, horticulture and crop breeding) and soil management scientists, hence the importance of the PhD Agronomy qualification.

So, the need for specialised agronomy scientists with advanced knowledge and can demonstrate high level of mastery, innovation, autonomy, scholarly and professional integrity in the crop sub-sector of Botswana's agricultural sector cannot be over emphasized. The Human Resource Development Council (HRDC) has since its first needs assessment report of 2015 up to date recognised the for developing capacity in the various fields and crop science and/or agronomy. The current report of 2023 still identifies the lack of qualified personnel as one of the bottlenecks to the implementation of agricultural policies and development projects. In the 2023 report, the skills in high demand include Agronomists, Soil Scientists, Horticulturists, Weed Scientists, Entomologists, and Molecular Biologists/Geneticists. Thus, according to the HRDC (2023b) report on recommendations for local training at Post Graduate level (Masters, Doctorate, Professional and Others) in the field of agriculture, the professionals needed were agronomists (Field Crops, Horticultural Crops, Soil Science, Fodder Crops, and Molecular Biologists/Geneticists).

PURPOSE: (itemise exit level outcomes)

The purpose of this qualification is to produce graduates with the most advanced knowledge, skills, and competence to:

1. Conduct original scholarly research related to crop production and management in all the various disciplines of agronomy (soil science, field crops, horticulture and crop breeding).
2. Develop and implement strategies for managing various agronomic enterprises in the fields of Field Crops, Horticultural Crops, Soil Science and Crop Breeding.
3. Contribute to formulating policies to solve complex and unpredicted problems in the agricultural industry, especially in the agronomy and crops subsector.
4. Communicate agronomy information effectively to diverse audiences through publications, presentations and appropriate technological media.

MINIMUM ENTRY REQUIREMENTS (including access and inclusion)

- Master's degree NCQF Level 9 in the same or cognate field of study.
- Candidates who do not meet the above minimum entry requirements will be considered through Recognition of Prior Learning (RPL) and Credit Accumulation and Transfer (CAT) as specified in policies by the Education and Training Provider (ETP) in line with the National RPL and CAT policies.

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SECTION B		QUALIFICATION SPECIFICATION	
GRADUATE PROFILE (LEARNING OUTCOMES)		ASSESSMENT CRITERIA	
1. Conduct original scholarly research with respect to theory, knowledge, or practice for field and horticultural crops, breeding of crop varieties development and sustainable soil resources management to solve societal problems.		1.1 Prepare a research proposal and formulate and test hypotheses 1.2 Select and utilise research instruments that are relevant to research problems in crop and soil science and related fields 1.3 Undertake field and laboratory work during actual research or investigation relevant to the research project 1.4 Report the findings of the investigation and formulate recommendations that emanate from the findings. 1.5 Apply to all the agronomy strands (field crops, horticultural crops, soil science and crop breeding).	
2. Conceptualise new ideas, designs, and techniques for agronomic management and research.		2.1 Analyse and evaluate different scientific procedures and techniques relevant to the agronomic problem being researched. 2.2 Apply the appropriate research methods or techniques in solving complex and unpredicted problems being investigated 2.3 Synthesize research information 2.4 Disseminate effectively research findings through various platforms and media 2.5 Develop policies informed by research.	
3. Contribute knowledge of agronomy (field crops, horticultural crops, soil science and crop breeding) to society in order to inform policy.		3.1 Share knowledge/technology with society 3.2 Evaluate and monitor the impact of knowledge shared	

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	3.3 Effect dissemination and adoption of knowledge transfer 3.4 Publish information briefs for knowledge and technology transfer
4. Communicate complex ideas in a clear and understandable manner	4.1 Give context to ideas using simple language 4.2 Apply relevant presentation techniques 4.3 Use appropriate technologies to simplify complex issues

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Qualifications Authority

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SECTION C		QUALIFICATION STRUCTURE			
COMPONENT	TITLE	Credits Per Relevant NCQF Level			Total Credits
		Level []	Level []	Level [10]	
FUNDAMENTAL COMPONENT Subjects/ Courses/ Modules/Units	N/A				
CORE COMPONENT Subjects/Courses/ Modules/Units	Ph D Thesis			360	360
STRANDS/ SPECIALIZATION	Subjects/ Courses/ Modules/Units	Credits Per Relevant NCQF Level			Total Credits
		Level []	Level []	Level [10]	

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STRANDS (where applicable)	1. Field Crops			360	360
	2. Horticultural Crops			360	360
	3. Soil Science			360	360
	4. Crop Breeding			360	360
Electives	N/A				



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SUMMARY OF CREDIT DISTRIBUTION FOR EACH COMPONENT PER NCQF LEVEL

TOTAL CREDITS PER NCQF LEVEL

NCQF Level	Credit Value
Core NCQF Level 10	360
TOTAL CREDITS	360

Rules of Combination:

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

Core NCQF Level 10, 360 Credits:

Learners conduct research and present a doctoral degree thesis worth 360 credits in one of the following areas of specialisation:

1. Field Crops
2. Horticultural Crops
3. Soil Science
4. Crop Breeding

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ASSESSMENT ARRANGEMENTS

Formative and summative assessments will be used.

Formative assessment

It will include seminars, research, and thesis drafting, which collectively contribute 20% of the final grade.

Summative assessment

A thesis will be submitted at the end of the research. The thesis shall contribute 80% of the final grade. Assessment of the thesis will be in accordance with respective ETP's regulations and procedures.

Assessment will be carried out by people with doctoral degrees in agronomy or related field..

MODERATION ARRANGEMENTS

Moderation will be carried out by people with doctoral degrees in Agronomy or related subjects. There is a provision for internal and external moderation in line with ETP policies.

RECOGNITION OF PRIOR LEARNING

There shall be a provision for the award of credits through Recognition of Prior Learning (RPL) in accordance with respective ETP's policies.

CREDIT ACCUMULATION AND TRANSFER

There shall be a provision for the award of credit through Credit Accumulation and Transfer (CAT) in accordance with respective ETP's policies.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Learning Pathways

- Doctor of Philosophy in Horticulture
- Doctor of Philosophy in Agriculture
- Doctor of Philosophy in Crop Science
- Doctor of Philosophy in Biological Science
- Doctor of Philosophy in Molecular Biology
- Doctor of Philosophy in Plant Science
- Doctor of Philosophy Soil Science

- Doctor of Philosophy Crop Protection

Employment Pathways

- Biosecurity Specialist
- Specialist Weed Scientist
- Specialist Plant Breeder
- Fodder Specialist
- Molecular Geneticist and Biotechnologist
- Market Development Horticulturalist/Agronomist
- Specialist Conservation Agriculturalist
- Soil Fertility/Plant Nutrition Specialist and Researcher

QUALIFICATION AWARD AND CERTIFICATION

The minimum condition for award of Doctor of Philosophy in Agronomy is 360 credits.

SUMMARY OF REGIONAL AND INTERNATIONAL COMPARABILITY

This qualification has been compared to the Doctor of Philosophy in Agronomy offered by the University of Nairobi, University of Stellenbosch, University of Pretoria and University of Texas A&M.

Title of Qualification, NQF Level & Credit Value or Duration

All qualifications are called Doctor of Philosophy in Agronomy. The ones from Universities of Nairobi and Stellenbosch and University of Pretoria are NQF level 10 in those countries and are using a similar qualifications framework to that of Botswana. The credit value is 360 for the three African universities and the duration of the study is 3 years. The University of A&M in the USA uses a different credit system and have no national qualification framework; the duration of that PhD is 3 years. For all the four universities, the entry level is similar; they all require an MSc in a cognate area.

Main Exit Outcome(s)

Regarding the main exit outcomes for the compared qualifications, all universities emphasise a systems approach in problem analysis; ability to choose appropriate resources and effective communication.

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Domains/Modules/Courses/Subjects covered (Fundamental, core & electives)

All universities do not offer course work for the Doctor of Philosophy in Agronomy qualification.

Assessment strategies and Weightings

For all universities, the qualification is assessed through examination of thesis

Qualification rules and minimum Standards for the award of the qualification

For the three African universities (University of Nairobi, University of Pretoria, University of Stellenbosch) candidates must attain 360 credits to be awarded the degree of Doctor of Philosophy in Agronomy

Education and Employment Pathways

Employment pathways are very similar for holders of Doctor of Philosophy all the three universities being compared to the qualification being developed; they can work in academia, research institutions, in all areas of agronomy.

This qualification is at par with the qualifications offered by the universities used in the comparative study. Articulation of this qualification with the ones examined shall be in accordance with respective ETP regulations and procedures. For all the areas of comparability, this qualification is similar to that of other universities: NQF level 10, 360 credits, research-based, candidates to be employed as academicians, researchers, agricultural policy analysts, or self-employed.

REVIEW PERIOD

5 years in line with the NCQF

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CODE (ID)			
REGISTRATION STATUS	BQA DECISION NO.	REGISTRATION START DATE	REGISTRATION END DATE
LAST DATE FOR ENROLMENT		LAST DATE FOR ACHIEVEMENT	