

BQA NCQF Qualification Template

DNCQF.FDMD.GD04

Issue No.: 01

QUALIFICATION SPECIFICATION SECTION A							
QUALIFICATION DEVELOPER		Botswana University of Agriculture and Natural Resources					
TITLE		Doctor of Philosophy in Crop Protection			NCQF LEVEL		10
FIELD		Agriculture and Nature Conservation		SUB-FIELDS		Crop Protection	
New qualification		✓		Review of existing qualification			
SUB-FRAMEWORK		General Education		TVET		Higher Education ✓	
QUALIFICATION TYPE		Certificate		Diploma		Bachelor	
		Bachelor Honours		Master		Doctor ✓	
CREDIT VALUE						360	
RATIONALE AND PURPOSE OF THE QUALIFICATION							
<p>Rationale</p> <p>About 40% of the population of Botswana live in rural areas and most of them derive their subsistence from crop production and related agricultural activities (Statistics Botswana, 2014). The agriculture sector is important because of the multiple backward and forward linkages to other sectors of the economy such as input services, transport, manufacturing, advisory services, financial services, and tourism. 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. A key challenge for Botswana is that the country is drought prone. Also, low adoption of technologies by farmers, inadequate research-extension linkages and limited highly trained and skilled human resources. These constraints of crop production require highly specialized trained crop scientists, hence the importance of this qualification.</p> <p>The need for Crop Scientist with advanced knowledge and 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 need to develop human resources in crop science (Horticulturists, Agronomists, Crop Breeders, Crop Protection Scientists and Soil Scientists) for research, extension and managerial positions in the Ministry of Agricultural Development and Food Security, and other related ministries and non-governmental organizations is great. The recent National Development Plans (NDP 8 and NDP 9), NAMPAADD (2002) and Human Resource Development Council (HRDC) reports have identified the lack of qualified personnel in specialized disciplines, as one of the bottlenecks to the implementation of agricultural policies and development projects (HRDC, 2015). In 2015, HRDC identified skills that are in high demand for agriculture sector by level. In the crops sub-sector the skills in demand per annum are Agronomists (40), Crop Scientists (20), Soil Scientists (20), Research Scientists (20), Molecular Biotechnologists (20), Plant Breeders (30), Soil Physicists (30), Soil Chemists (30), Soil Biologists (20), Seed Technologists (20), Weed Scientists (30), Florists (40), Pomologists (Fruit Scientists) (50), Olericulturists (Vegetable Scientists) (50), Postharvest Physiologists (60), Geneticists (30), Plant Pathologists (100), Entomologists (60), Greenhouse Technicians (80) and Field Crop Producers (50). The above mentioned skilled and competent personnel are</p>							

to be provided by through this qualification. (HRDC, 2015). The above skilled and competent personnel required at higher level of training at masters and PhD levels to provide evidence-based policy reforms for the agriculture sector (HRDC, 2015, 2019). PhD training should no longer be treated as a luxury but a necessity for the agriculture sector (HRDC, 2015). Entomologists and plant pathologists are among the technical and soft skills for the top occupations in demand in Botswana (HRDC, 2019). Therefore, the importance of this qualification for Botswana.

Purpose

The purpose of this qualification is to equip students with skills, knowledge and competencies to;

- conduct research related to crop protection and management.
- develop and implement strategies for crop protection against pests and diseases
- solve complex and unpredicted problems in horticulture independently, systematically, and creatively in familiar and unfamiliar contexts facing the crop sub-sector of the Agricultural Industry in Botswana.
- communicate effectively to a diverse group of people using appropriate technological media.

ENTRY REQUIREMENTS (including access and inclusion)

The minimum admission requirement for Doctor of Philosophy in Crop Protection shall be one of the following:

- 1.1 NCQF Level 9 in the same or cognate field of study.
- 1.2 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.

QUALIFICATION SPECIFICATION		SECTION
B		
GRADUATE PROFILE (EXIT LEVEL OUTCOMES)	ASSESSMENT CRITERIA	
At the end of the qualification, graduates will be able to;		
1. Apply and demonstrate advanced knowledge, skills, and competences in the field of crop protection to design, undertake and write up research.	1.1 Develop research proposals 1.2 Formulate and test hypotheses 1.3 Design field and laboratory experiments 1.4 Collect data 1.5 Analyze and interpret the research data concisely 1.6 Communicate research findings through different platforms and media	

<p>2. Apply highly specialized skills in the selection of appropriate scientific procedures and research methods or techniques in solving complex and unpredicted problems in crop protection</p>	<p>2.1 Analyze and evaluate different scientific procedures and techniques relevant to the problem being researched.</p> <p>2.2 Apply the appropriate research methods or techniques in solving complex and unpredicted problems being investigated</p> <p>2.3 Synthesize research information</p> <p>2.4 Communicate effectively research findings through various platforms and media</p> <p>2.5 Develop policies informed by research</p>
<p>3. Apply specialized skills and knowledge in literature review relevant to the research problem</p>	<p>3.1 Review, interpret and synthesize literature from different sources on the problem being researched</p> <p>3.2 Draw conclusions from different literature sources and indicate anomalies.</p> <p>3.3 Develop a theoretical conceptual framework provided by the literature review</p> <p>3.4 Compile a complete bibliography</p>
<p>4 Apply specialized and advanced skills to develop a thesis, dissertation or scientific manuscript that is linguistically, technically, and scientifically correct</p>	<p>4.1 Compile relevant information and synthesized research data</p> <p>4.2 Publish a dissertation and manuscripts that are linguistically, technically, and scientifically sound and acceptable to examiners and journal reviewers in different platforms and media.</p> <p>4.3 Circulate the dissertation and manuscripts in different platforms and media</p>

**QUALIFICATION STRUCTURE
SECTION C**

CORE COMPONENT Subjects / Units / Modules /Courses	Title	Level	Credits
	Proposal Development	10	60
	Proposal Seminar Presentation	10	10
	Research and Thesis	10	280
	Thesis Seminar	10	10
	Total		360

RULES OF COMBINATION, CREDIT DISTRIBUTION

Candidates will have to complete 360 credits from the core subjects. There are no electives in this qualification. The total number of credits to be completed are 360 credits.

ASSESSMENTS AND MODERATION ARRANGEMENTS

ASSESSMENTS

Formative and summative assessments will be used.

Formative assessment

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

Summative assessment

There shall be a thesis to 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 BQA registered and accredited assessors.

MODERATION

Internal Moderation Arrangements

Pre-moderation is done by relevant internal structures. Quality assurance of the assessment instruments is conducted prior to administration. Research proposal seminar are pre- and post-moderated internally. The thesis and thesis defense seminar will also be internally moderated.

Moderation will be carried out by BQA registered and accredited moderators.

External Moderation Arrangements

The thesis and thesis defense seminar will be externally moderated

RECOGNITION OF PRIOR LEARNING (if applicable)

There shall be provision for award of the qualification through Recognition of Prior Learning (RPL) in accordance with institutional Policies in line with the National RPL Policy.

Candidates may submit evidence of credits accumulated in related qualification to be credited for the qualification they are applying for.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

The Doctoral Degree is the highest qualification type on the NCQF. The only progression pathway is horizontal articulation with another Doctoral Degree in a cognate field.

Horizontal Progression

- Doctor of Philosophy Degree in Horticulture
- Doctor of philosophy Degree in Agriculture
- Doctor of philosophy in Crop Science
- Doctor of Philosophy Degree in Biological Science
- other related disciplines.

Employment Pathways

Holders of the qualification can work as:

- Crop protection Consultant.
- Crop protection Researcher.
- Crop protection and agrochemicals Entrepreneur.
- Farm Manager.
- Crop protection Lecturer.
- Crop protection Policy Analyst

QUALIFICATION AWARD AND CERTIFICATION

For a candidate to graduate with a Doctor of Philosophy Degree in Crop Protection, they should:

- have presented research proposal before a panel of judges
- have passed the thesis
- have passed thesis defense seminar
- have attained 360 credits.

Certification:

There shall be an award of Doctor of Philosophy Degree in Crop Protection upon successful completion of the qualification.

REGIONAL AND INTERNATIONAL COMPARABILITY

Extensive regional and international comparability was conducted with various countries and the following countries were chosen because of their best practice:

Benchmarking for the Doctor of Philosophy in Crop Protection was done with regional and international universities. 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 Nairobi, University of Pretoria, Stellenbosch University, Kansas State University, Ohio State University, Washington State University, Oregon State University and Cornell University (Ithaca). The following universities offer PhD qualification in Crop Protection with research only University of Nairobi, University of Pretoria,



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Stellenbosch University, Kansas State University, Washington State University and Oregon State University. The remaining universities offer PhD qualification in Crop Protection with both course work and research. All universities selected are ranked high on the world scale and were selected because of their long history of best practices in academia. This qualification is at par to the qualifications offered by the universities listed above.

REVIEW PERIOD

After every five (5) years