

BQA NCQF Qualification Template

DNCQF.FDMD.GD04

Issue No.: 01

QUALIFICATION SPECIFICATION							SECTION A
QUALIFICATION DEVELOPER		Botswana University Agriculture & Natural Resources (BUAN)					
TITLE		Bachelor of Science in Animal Science			NCQF LEVEL		7
FIELD	Agriculture and Nature Conservation	SUB-FIELD		Animal Science			
New qualification		✓	Review of existing qualification				
SUB-FRAMEWORK		General Education			TVET		Higher Education
		Certificate			Diploma		Bachelor
QUALIFICATION TYPE		Bachelor Honours			Master		Doctor
CREDIT VALUE						480	
RATIONALE AND PURPOSE OF THE QUALIFICATION							
<p>RATIONALE</p> <p>Animal agriculture, especially ruminant animals are a cornerstone of farming and economy in rural communities in Botswana. Cattle, goats and sheep are found in rural communal farming systems in higher proportion (88.5, 97.9 and 95.3% respectively; Statistics Botswana 2015). In particular beef export is the main contributor of agriculture towards GDP. In this sense livestock management and technologies should be geared to rural farmers in order to improve productivity and efficiency. In addition, other livestock such as poultry (chicken and ostrich), swine and donkey contribute to the livelihoods of both small-scale farmers in rural areas and large-scale farmers. This call for improvement in husbandry practices to not only ensure efficiency but to also produce a healthy and wholesome product. Therefore, this programme of study in animal science aim at encompassing all facets and critical phases in the livestock production chain in the training of young animal scientists with the view of serving the livestock industry of Botswana and the region to create employment and wealth. Pillar One of National Vision 2036 promote sustainable economic development through export-led economy. In the 21st century wealth creation will be underpinned by knowledge-based economy and hence expanding human capital is critical. However, agricultural knowledge only is not enough, as it is goods and services from primary production which are consumed. Therefore agro-business and entrepreneurship is important and animal agriculture as taught through the programme has the ability to support micro and small enterprises and manufacturing that contribute to the economy (value addition).</p> <p>Central to the government's policy on household nutrition is food security and poverty alleviation. This programme is designed to contribute towards reducing poverty and food insecurity through training young people who will be future food producers, innovators in food production and food scientists. Supporting policies to this central policy of poverty alleviation and food security are Ministry of Agricultural Development and Food Security's National Policy on Agricultural Development (NPAD) – 1991 (Botswana Government 1991), National Master Plan for Arable Agriculture and Dairy Development (NAMPAADD) (Ministry of Agriculture 2001) and the Strategy for Development of the Dairy Sector in Botswana (2013) among other initiative. The graduate from this qualification should function within these frameworks as either farmers, policy makers or innovators.</p>							

PURPOSE

The purpose of this qualification is to:

- Equip learners with knowledge and skills in managing rangelands and their associated ecosystems used for raising of livestock in Botswana, especially grazing ungulates.
- Equip learners with capabilities as animal scientists and farmers that are stewards of the environments in order to sustainably support livestock production.
- Equip learners with competencies on working in both intensive and extensive or extensive production systems (organic) in poultry and swine production.
- Empower the youth and women to start their own small stock businesses or be advisors to small stock farmers.
- Empower learners to tackle challenges in the livestock sector such as diseases, nutrition, market and climate change.
- Empower learners to provide solutions to the general farming industry as farmers, innovators/scientists and or policy makers.

ENTRY REQUIREMENTS (including access and inclusion)

Minimum entry requirement for this qualification is a:

- Certificate Level IV in General Education (e.g. BGCSE or its equivalence) with passes in Biology, Chemistry, Physics, Mathematics and English Language.

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 SECTION B		SPECIFICATION
GRADUATE PROFILE (LEARNING OUTCOMES)	ASSESSMENT CRITERIA	
1. Demonstrate proficiency in scientific methodologies such as animal experimental design, and the critical analysis of animal research data in the laboratory and in the field and their interpretation.	Design and execute research projects and experiments in the course of two semesters under supervision of academic staff.	
2. Present and communicate ideas and scientific opinions (current hot topics) effectively in order to offer professional insight, interpretations and solutions to problems appropriate to animal agriculture.	Conduct oral/written presentations of assignments, research projects, case study and field work using state of the art science information in the field of animal agriculture.	

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3. Demonstrate effective searching and retrieval skills and information processing skills using the appropriate research engines and e-resources.	Critic scientific information, analyse and discuss findings and give advice or implications and recommendations.
4. Demonstrate in-depth knowledge of international policies, treaties, protocols and trends in Animal Agriculture.	Interpret and assess world animal production, health and animal trade policies and protocols and interrogate their relevance to Botswana and the region.
5. Demonstrate knowledge of how climate change impact Animal Agriculture and how to mitigate its effects.	Analyze animal factors contributing to climate change and how climate change impact animal production efficiencies.
6. Demonstrate skills and knowledge essential to form and operate a success animal agriculture and related businesses.	Design and presentation of viable animal related business plans.
7. Demonstrate skills in routine and innovative livestock management strategies.	Design and implement livestock management plans (feeding, health, breeding etc).
8. Demonstrate skills in articulating cross-sectional ideas in climate change, sustainable development goals, trans-boundary diseases, and animal products-related human diseases.	Critical analysis of information and interdisciplinary and multidisciplinary interaction and collaborate with other disciplines.

QUALIFICATION STRUCTURE				SECTION C
FUNDAMENTAL COMPONENT Subjects / Units / Modules /Courses	Title	Level	Credits	
	Mathematics I	5	12	
	General and Inorganic Chemistry	5	12	
	Physics	5	12	
	Biology of Cells	5	12	
	Communication and Academic Literacy Skills I	6	12	
	Computer Skills Fundamentals I	6	8	
	Mathematics II	5	12	
	Physical and Organic Chemistry	5	12	
	Physics II	5	12	
	Biodiversity	5	12	
	Communication and Academic Literacy Skills II	6	12	
	Computer Skills Fundamentals II	6	8	
	TOTAL		136	
CORE COMPONENT Subjects / Units /	Introduction to Agricultural Economics	6	8	
	Introduction to Animal Science	6	12	
	Animal Anatomy and Physiology	6	12	

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Modules /Courses	Livestock Production Systems	6	8
	Introduction to Range Science	6	8
	Introduction to Genetics	6	8
	Livestock Feeds and Feeding	6	12
	Reproduction and Obstetrics	6	12
	Agricultural Extension	6	12
	General Microbiology	6	8
	Field Practical Training I	7	12
	Livestock Feed Processing	7	8
	Meat Science	7	12
	Animal Breeding	7	8
	Biometry I	7	8
	Biometry II	7	8
	Biochemistry	7	8
	Animal Health	7	12
	Feedstuff Analysis	7	12
	Animal Diseases	7	12
	Principles of Animal Nutrition	7	8
	Field Practical Training II	7	12
	Livestock Product Processing	7	12
	Project	7	20
	TOTAL		252
ELECTIVE COMPONENT Subjects / Units / Modules /Courses	RUMINANT OPTION SET		
	Range Plant Taxonomy	7	8
	Ruminant Nutrition	7	8
	Range Survey and Monitoring	7	8
	Fodder Production	7	8
	Beef Production	7	8
	Game Farming and Ranching	7	8
	Dairy Production	7	12
	Sheep and Goat Production	7	8
	TOTAL		68
	OR		
	NON-RUMINANT OPTION SET		
	Monogastric Nutrition	7	8
	Equine Management	7	8
	Aquaculture	7	8
	Pet Management	7	8
	Farm Business Management	7	8
	Poultry Production	7	8
	Pig and Rabbit Production	7	12
	Ostrich Production	7	8
	TOTAL		68
	OPTION SET 3		
	Vertebrate Zoology	6	8

	OR Invertebrate Zoology		
	Animal Behaviour OR Environmental Physiology of Farm Animals	7	8
	Animal Biotechnology OR Applied Animal Breeding	7	8
	TOTAL		24

Rules of combinations, Credit distribution (where applicable):

This qualification has a total credit load of 480 credits for both Ruminant and Non-Ruminant options.

1. At Levels 6 and 7, Learners studying this qualification shall choose optional courses that lead to a final exit on either ruminant or non-ruminant option.
2. Learners shall choose courses between Vertebrate Zoology or Invertebrate Zoology in Level 6; and between Animal Behaviour or Environmental Physiology of Farm animals, and between Animal Biotechnology or Applied Animal Breeding in Level 7.

Credit Distribution

Level 5 = 96

Level 6 = 148

Level 7 = 236

Total = 480

ASSESSMENT & MODERATION ARRANGEMENTS

ASSESSMENT ARRANGEMENTS

All assessments, formative and summative, leading/contributing to the award of credits or qualification will be based on learning outcomes and/or sub-outcomes.

Formative assessment

The contribution of formative assessment to the final grade is 50%.

Summative assessment

The contribution of summative assessment to the final grade is 50%.

MODERATION ARRANGEMENTS

The purpose of the moderation is to ensure that assessment and marking across all Modules is fair, valid, and reliable. It also ensures that the assessment tool is aligned to the learning outcomes, that it is set at appropriate level of study and, that the process of marking is consistent.

Internal and external moderators to be engaged will be BQA accredited subject specialists in relevant fields with relevant industry experience and academic qualifications.

Both internal and external moderation shall be done in accordance with applicable policies and regulations.

RECOGNITION OF PRIOR LEARNING (if applicable)

Recognition of prior learning (RPL) shall be used to augment entry into the qualification for candidates who do not have required entry requirement into the qualification. Assessment shall be done to determine whether the candidate has an abundance of relevant knowledge and skills acquired through formal or informal methods, workplace learning, or work experience gained from animal agriculture, biological science, environmental science or wildlife biology and other related fields. Diploma holders in Animal Health & Production, Agriculture or related Animal qualification of two years will be considered for enrolment. Candidates will be expected to provide evidence of learning such as transcripts from institution of learning and references from employers to support their applications. Such evidence should meet the criteria of being relevant, sufficient, valid, verifiable and authentic. This knowledge shall be awarded credits based on developed criteria for such.

RPL will also be assessed to determine whether it can award credits to contribute to the exit learning outcomes.

Relevant vocational qualification at NCQF Levels 5 or 6 are eligible for exemption or credit transfer in accordance with applicable University policies.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

Learning progression Pathways

This qualification is an Animal Science major, but apart from it, the enrolled candidates may opt for any of the following:

Horizontal Articulation:

1. BSc Biodiversity (Ecology Stream) at NCQF 7
2. BSc Wildlife Management at NCQF 7
3. BSc Range Sciences at NCQF 7
4. BSc Biological Sciences at NCQF 7
5. Bachelor of Veterinary Science at NCQF level 7
6. Any of the BSc qualifications in Agricultural Sciences and Natural Resources at NCQF 7

Holders of this qualification can progress as follows:

Vertical Articulation:

1. BSc (Honours) Animal Science at NCQF Level 8
2. MSc Animal Science and related fields, at NCQF 9
3. PhD Animal Science and related fields, at NCQF Level 10

Employment Pathways

BSc Animal Science graduates can be employed as:

1. Manager (Farm, Food chain)
2. Livestock consultant
3. Wildlife Biologist
4. Research scientist
5. Lecturer in tertiary institutions
6. Agricultural Advisor in Community Trusts

7. Environmental health officers
8. Biology field technician
9. Animal Biosecurity officer
10. Livestock Abattoir or butcheries
11. Livestock product sales, marketing, Auction
12. Public relations and promotions (Breed Societies, Breed services, Farmers' Associations, Livestock publications)
13. Farm credit service, financing and insurance
14. Feed manufacturing & distribution
15. Feed mill management
16. Field service technician and/or research technician

QUALIFICATION AWARD AND CERTIFICATION

Award of BSc in Animal Science after;

The degree awarded will be a Bachelor of Animal Science upon fulfilments of all the study requirements. The award of the qualification will be on conditions of successful completion of courses, both theory, practical and industrial attachment and credit load should meet the minimum requirement of 480 credits for both Ruminant and Non-Ruminant options.

REGIONAL AND INTERNATIONAL COMPARABILITY

Comparable to BSc programmes in the region (South Africa, Namibia) and Sub-Saharan Africa

Location	Name	Qualification title	No of years	Credit value
Namibia	University of Namibia	Bachelor of Science in Agriculture (Animal Science) honours	5	544
Republic of South Africa	University of Free State	Bachelor of Science in Animal, Wildlife and Grasslands	4	Minimum 392
Republic of South Africa	University of Pretoria	Bachelor of Science in Agricultural Animal Science	4	560

The qualification was compared with similar or equivalent qualifications from several institutions regionally as shown in the table above.

REVIEW PERIOD

This qualification will be reviewed after every 5 years.