



**SCHOOL OF
VETERINARY MEDICINE**
Prospectus 2022

OFFICE OF THE ASSOCIATE DEAN SCHOOL OF VETERINARY MEDICINE (Neudamm Campus)

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Adjunct Lecturer: Dr G Hanstein: BVSc (University of Pretoria)
Adjunct Lecturer: Ms B Hoffmann: MA (Ind & Org Psych), PCC (ICF), CPRP (PRISA), CHR (IPMN)
Vet. Para-professional: Mr U Ujava: Dip Agric (University of Namibia)
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Lecturer: Dr D Mudimba: BVSc (University of Zimbabwe)
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 Lecturer: Dr L de Villiers: BVSc, MSc (University of Pretoria)
 Lecturer: Dr M Dahlberg: BVSc (University of Pretoria)
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 Adjunct Lecturer: Prof J Schoeman: BVSc, MMedVet, PhD (University of Pretoria)
 Adjunct Lecturer: U. Tubbesing: BVSc, M. Med. Vet, (University of Pretoria)
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 Adjunct Lecturer: Dr D Marggraff BVSc (University of Pretoria)
 Adjunct Lecturer: Dr D. Rodenwoldt: BVSc (University of Pretoria)
 Clinician: Dr M de Villiers BVSc (University of Pretoria)
 Clinician: Dr L Holtzhausen BVSc (University of Pretoria)
 Veterinary Nurse: Sr C Paetow: Dip. Vet. Nursing (University of Pretoria)
 Veterinary Nurse: Sr M Loschke: Dip. Vet. Nursing (University of Pretoria)
 Veterinary Nurse: Sr N Foerster: Dip. Vet. Nursing (University of Pretoria)
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 Senior Lecturer: Dr M Jago: MA, Vet M.B. (Cambridge University), MRCVS
 Senior Lecturer: Dr F Bruwer: BVSc (University of Pretoria); M. Med. Vet. (University of Pretoria)
 Senior Lecturer: Dr F Chitate: BVSc (University of Zimbabwe); MSc (University of Reading)
 Lecturer: Dr I Kaatura: Nat. Dip. Agric., BVM (University of Zambia); PGDM (Stellenbosch)
 Lecturer: Dr P Mbiri: BVSc (University of Zimbabwe); MSc (University of Pretoria)
 Veterinary Clinician: Dr V.G. Mutjavikua: BVSc (University of Pretoria)
 Staff Development Fellow: Dr I Amuthitu: BVM (University of Namibia)
 Adjunct Lecturer: Dr D. Rodenwoldt: BVSc (University of Pretoria)
 Adjunct Lecturer: Dr B.E. Voigts: BVSc (University of Pretoria)
 Adjunct Lecturer: Dr Arnold Olivier: BVSc (University of Pretoria)
 Adjunct Lecturer: Dr C. Brain: BVSc (University of Pretoria); PhD (University of Witswatersrand)

BACHELOR OF VETERINARY MEDICINE (17BVET) Six year Programme**PROGRAMME SCHEDULE****YEAR 1 (148 CREDITS)****Semester 1**

MODULE CODE	MODULE TITLE	NQF LEVEL	L	P	CREDITS	PRE-REQUISITES	CO-REQUISITES
PHY 3501	Physics for Life Science	5	02/28	21	8		
LEA 3519	English for Academic Purposes	5	04/56		16		
CSI 3580	Contemporary Social Issues	5	01/14		4		
BLG3511	Introduction to Biology	5	04/56	42	16		
MAT3511	Basic Mathematics	5	04/56	28	16		
BVM3511	Veterinary Structure and Function I	5	10/98		20		
Total Semester 1 credits:					80		

Semester 2

MODULE CODE	MODULE TITLE	NQF LEVEL	L	P	CREDITS	PRE-REQUISITES	CO-REQUISITES
BVM3512	Veterinary Structure and Function II	5	14/98		32		BVM 3511
CLC 3509	Computer Literacy	5	02/28		8		
BVB 3532	Veterinary Biochemistry	5	04/56	21	16		
BVM 3542	Veterinary Genetics	5	02/28	21	8		
CSI 3580	Contemporary Social Issues	5	01/14		4		
Total Semester 2 credits:					68		

YEAR 2 (168 CREDITS)**Semester 1**

MODULE CODE	MODULE TITLE	NQF LEVEL	L	P	CREDITS	PRE-REQUISITES	CO-REQUISITES
BVM 3601	Animal Ethology and Welfare	6	02/28	21	8		
BVC 3611	Veterinary Microbiology	6	04/56	21	16	BLG 3511	
BVM3631	Veterinary Structure and Function III	6	14/98		32	BVM 3511, BVM 3512	
BVM 3651	Veterinary Parasitology I	6	04/56	42	16	BLG 3511	
Total Semester 1 credits:					72		

Semester 2

MODULE CODE	MODULE TITLE	NQF LEVEL	L	P	CREDITS	PRE-REQUISITES	CO-REQUISITES
BVM 3602	Veterinary Immunology and Vaccinology	6	02/28	21	8		BVM 3601
BVM3632	Veterinary Structure and Function IV	6	7/98		32	BVM 3511, BVM 3512	BVM 3631
BVM 3652	Veterinary Parasitology II	6	04/56	42	16	BLG 3511	
BVM 3612	Animal Nutrition and Pasture Science	6	04/56	21	16	BVM 3511, BVM 3512 BVB 3532	
BVM 3622	Animal Production	6	02/28	21	8		
BVM 3642	Biometry	6	04/28	21	12	MAT 3511	
BVM 3609	Field Practical Training: Laboratory	6	1 week		4		
Total Semester 2 credits:					96		

YEAR 3 (144 CREDITS)**Semester 1**

MODULE CODE	MODULE TITLE	NQF LEVEL	L	P	CREDITS	PRE-REQUISITES	CO-REQUISITES
BVM 3701	General Surgery	7	02/28	21	8	BVM 3631, BVM 3632	
BVM 3731	Diagnostic Imaging	7	02/28	21	8	BVM 3631, BVM 3632	
BVM 3721	Herd Health Management and Economics I	7	02/28	21	8	BVM 3651, BVM 3622, BVM 3602	
BVM 3711	Infectious Diseases I	7	04/56	21	16	BVM 3601	
BVM 3700	Veterinary Pharmacology	7	02/56	21	8	BVM 3651, BVM 3652, BVM 3631, BVM 3632	
BVM 3740	Veterinary Toxicology	7	02/56	21	8	BVB 3532, BVM 3631, BVM 3632	
BVC 3701	Fish and Bee Medicine	7	02/14		8		
BVM 3720	General Pathology	7	02/56	21	8	BVM 3631, BVM 3632, BVM 3651, BVM 3652, BVM3602	
Total Semester 1 credits:					72		

Semester 2

MODULE CODE	MODULE TITLE	NQF LEVEL	L	P	CREDITS	PRE-REQUISITES	CO-REQUISITES
BVM 3732	Anaesthesiology	7	02/28	21	8	BVM 3631, BVM 3632	BVM 3701 BVM 3731
BVM 3722	Herd Health management and Economics II	7	02/28	21	8	BVM 3651, BVM 3622, BVM 3602	
BVM 3720	General Pathology	7	02/56	21	8	BVM 3631, BVM 3632, BVM 3651, BVM 3652, BVM3602	
BVM 3700	Veterinary Pharmacology	7	02/56	21	8	BVM 3651, BVM 3652, BVM 3631, BVM 3632	
BVC 3740	Veterinary Toxicology	7	02/28	21	8	BVB 3532, BVM 3631, BVM 3632	
BVM 3712	Infectious Diseases II	7	04/56	21	16	BVM 3611	BVM 3711
BVM 3702	Ethnoveterinary Medicine	7	02/28	21	4		
BVC 3722	Clinical diagnostics	7	02/28		8	BVM 3631, BVM 3632	
BVM 3709	Field Practical training: State and Private Vet	7	1 week		4		
Total Semester 2 credits:					72		

YEAR 4 (160 CREDITS)

Semester 1

MODULE CODE	MODULE TITLE	NQF L	L	P	CREDITS	PRE-REQUISITES	CO-REQUISITES
BVM 3821	Clinical Pathology	8	02/28	21	8		BVC 3831 BVM 3811
BVM 3800	Systemic Pathology	8	02/28	21	8	BVM 3720	
BVC 3801	Wildlife Clinical Studies I	8	05/70		8		
BVM 3811	Veterinary Public Health I	8	04/56	21	16	BVM 3720, BVM 3651, BVM 3652 BVM 3711, BVM 3712	
BVC 3831	Production Animal Clinical Studies I	8	07/98		16	BVM 3701, BVM 3731, BVM 3732, BVM 3711, BVM 3712, BVM 3740	
BVC 3800	Companion Animal Clinical Studies I (year)	8	07/98		16	BVM 3701, BVM 3731, BVM 3732, BVM 3602, BVM 3652, BVM 3700, BVM 3740	
BVB 3800	Theriogenology I (year)	8	05/70		8	BVM 3612, BVM 3700, BVM3711, BVM 3712, BVM 3701, BVM 3721	
Total Semester 1 credits:					80		

Semester 2

MODULE CODE	MODULE TITLE	NQF	L	P	CREDITS	PRE-REQUISITES	CO-REQUISITES
BVM 3812	Veterinary Public Health II	8	04/56	21	16	BVM 3720, BVM 3651, BVM 3652 BVM 3711, BVM 3712	BVM 3811
BVC 3800	Companion Animal Clinical Studies I (year)	8	7/98		16	BVM 3701, BVM 3731, BVM 3732, BVM 3602, BVM 3652, BVM 3700, BVM 3740	
BVC 3802	Wildlife Clinical studies II	8	05/70		8		BVC 3801
BVM 3800	Systemic Pathology	8	02/28	21	8	BVM 3720	
BVC 3832	Production Animal Clinical Studies II	8	07/98		16	BVM 3701, BVM 3702	

BVM 3822	Research methodology	8			8	BVM 3642	
BVB 3800	Theriogenology I (year)	8		05/70	8	BVM 3612, BVM 3700, BVM3711, BVM 3712, BVM 3701, BVM 3721	
Total Semester 2 credits:					80		

YEAR 5 (172 CREDITS)

Semester 1

MODULE CODE	MODULE TITLE	NQF LEVEL	L	P	CREDITS	PRE-REQUISITES	CO-REQUISITES
BVM 3890	Companion Animal Clinical Studies II (year)	8	7/98		16	BVC 3811, BVC 3812	
BVC 3871	Production Animal Clinical Studies III	8	7/98		16	BVC 3831, BVC 3832	
BVE 3800	Equine Clinical Studies	8	5/70		8	BVC 3722	
BVB 3880	Therigenology II (year)	8	5/70		8	BVB 3800	
BVM 3880	Veterinary professional skills	8	2/56		4 (year)		
BVM 3862	Wildlife Clinical Studies III	8	05/70		8	BVC 3801, BVC 3802	
BVM 3871	Epidemiology I	8	04/56		16	BVM 3642, BVM 3711, BVM 3712	
BVC 3880	Research Project	8	03/42		(year)	BVM 3882	
Total Semester 1 credits:					76		

Semester 2

MODULE CODE	MODULE TITLE	NQF LEVEL	L	P	CREDITS	PRE-REQUISITES	CO-REQUISITES
BVC 3872	Production Animal Clinical Studies IV	8	7/98		16	BVC 3831, BVC 3832	BVC 3871
BVC 3852	Companion Animal Clinical Studies II (year)	8	7/98		16	BVC 3811, BVC 3812	
BVM 3802	Therigenology II (year)	8	5/70		8		BVM 3871
BVE 3800	Equine clinical studies	8	5/70		8	BVC 3722	
BVM 3872	Epidemiology II	8	2/28		8	BVM 3642, BVM 3711, BVM 3712	
BVM 3880	Veterinary Professional skills	8	2/56		(year)		
BVC 3880	Research Project	8	03/42		32	BVM 3762, BVM 3822, BVC 3861	
BVM 3742	Policy, Legislation & Jurisprudence	8	02/32		8		
Total Semester 2 credits:					96		

YEAR 6 (140 CREDITS)

Semesters 1 & 2

MODULE CODE	MODULE TITLE	NQF LEVEL	Weeks	Credits	PRE-REQUISITES
BVC 3890	CLINICAL ROTATION	8	48	140	BVM V
Compulsory:	Outpatients		4	12	
	Pathology and Parasitology		2	6	
	Veterinary Professional skills		1	3	
	Production Animal Clinical Studies Neudamm Clinic and Ambulatory clinic		5	15	
	Theriogenology Ruminants		2	6	
	Theriogenology Equines		1	3	
	Veterinary Public Health A & B		2	6	
	Companion Animal Clinical Studies Mobile Clinic		1	3	
	Companion Clinic		2	6	
	Surgery A & B		3	12	
	Anaesthesiology and Pharmacology		3	12	
	Diagnostic Imaging A & B		2	6	
	State Veterinary Practice		2	6	
	Private Veterinary Practice		3	12	
	SPCA		1	3	
	Cage Birds and Exotic Animal Clinic		1	3	
	Equine Clinic		1	3	
	Cadaver Surgery		1	3	
	Epidemiology		1	3	
	Isolation Ward		4	12	
	Veterinary Association Congress		1	Attendance	
	Revisit (a catch-up opportunity)		2	Attendance	
Elective:	Exotic animals, Fish and Bee Medicine, Wildlife capture, Community veterinary clinic, Equine, Veterinary Laboratory, Nutrition, Semen freezing, Pigs, Poultry, (certain electives not available in Namibia are offered at OVAH)		3	9	

Module Title:	PHYSICS FOR LIFE SCIENCES
Module Code:	PHY 3501
NQF Level:	5
Notional Hours:	80
Contact hours:	Lectures: 2 x 1hr lectures / week for 14 weeks (28 hrs) Practicals: 1 x 3hr practical / alternate week for 14 weeks (21hrs)
NQF Credits:	8
Pre-requisites:	None
Co-requisite:	None
Compulsory/Elective:	Compulsory
Semester Offered:	1

Module Aim:

This module aims to introduce life science students (such as agricultural, biological, and environmental science students) to fundamental physics concepts and its applications, especially in mechanics, that will be useful to them in their undergraduate studies and respective careers. The module exposes the student to a wide range of applications involving problem-solving in life science related fields. The module is non-calculus based and largely aims to build a stimulating conceptual-based understanding of the basic laws of physics.

Learning outcomes:

Upon successful completion of this module, the student should be able to:

1. Employ units correctly, do unit conversions, use significant figures and take accurate measurements with different measuring instruments such as micrometers, and Vernier callipers.
2. Finding of the resultant of different vectors by component method and by the geometrical addition method.
3. Apply Newton's laws of motion to solve simple mechanical problems.
4. Discuss linear and circular motions and compute the involve quantities, such as the radius of an orbital motion.
5. Explain and use the conditions for bodies in mechanical equilibrium.
6. Discuss how to solve problems on work, energy and power.
7. Explain and apply the law of conservation of momentum and distinguish between elastic and inelastic collisions.
8. Apply Newton's law of universal gravitation and discuss Kepler's laws of planetary motion.

Module Contents:

Physics and Measurement: units and unit conversion, SI-unit system and non-metric systems, significant figures and scientific notation.

Vectors: vectors and scalars, operations with vectors in two dimensions, component method of vector operations

Motion 1 and 2 Dimensions: average velocity; acceleration; motion at constant acceleration; freely falling bodies; Projectiles; uniform circular motion

Newton's Laws of Motion: force and weight, Newton's first, second and third laws, applications of Newton's laws, free-body diagrams, friction, motion on inclined planes; centripetal force, banking of curves.

Gravitation: Newton's law of universal gravitation; gravity near the Earth's surface, satellites; Kepler's first, second and third laws.

Work, Energy and Power: work done by a constant force, kinetic energy, work-energy theorem, potential energy, conservation of mechanical energy, power.

Momentum: conservation of momentum; collisions in one dimension; impulse; conservation of energy and momentum in collisions; elastic and inelastic collisions in one dimension.

Methods of Facilitation in Learning:

Through lectures, tutorials, presentations, case studies, illustrations, laboratory practicals, written assignments, group work, class discussions.

Assessment Strategies:

- Continuous assessment (tests, practicals and assignments): 50%.
- Written examination (1 x 2-hour paper): 50%
- Minimum mark to pass the module: 50%
- The tests and examination will cover the module content.

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- regular reviews of module content
- effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	ENGLISH FOR ACADEMIC PURPOSES
Module Code:	LEA 3519
NQF Level:	5
Notional Hours:	160
Contact hours:	Lectures: 4 x 1hr lectures / week for 14 weeks (56 hrs)
NQF Credits:	16
Pre-requisites:	None
Co-requisite:	None
Compulsory/Elective:	Compulsory
Semester Offered:	1

Module Aim:

To enable students to use English effectively in the academic contexts they will encounter in their studies. The main emphasis is on improving students' confidence and competence in using English in these contexts. As far as possible, the subject will address the specific language needs of students' ability levels and subject specialisms.

Learning outcomes:

Upon completion of this module, students should be able to:

1. Write effectively and accurately within an academic context;

2. Follow the conventions of academic writing;
3. Read critically and effectively;
4. Access academic journals and other sources of information;
5. Listen to academic lectures and taking notes;
6. participate in academic seminars and discussions;
7. Deliver presentations within their area of interest and beyond.

Module Contents:

This module develops a student's understanding, and competencies regarding academic conventions such as academic reading, writing, listening and oral presentation skills for academic purposes. Students are required to produce a referenced and researched essay written in formal academic style within the context of their university studies, Students are also required to do oral presentations based on their essays. The reading component of the module deals with academic level texts; this involves students in a detailed critical analysis of such texts. The main aim is therefore, to develop academic literacy in English

Methods of Facilitation in Learning:

Through lectures, tutorials, presentations, case studies, illustrations, laboratory practicals, written assignments, group work, class discussions.

Assessment Strategies:

Continuous Assessment: minimum 2 tests, 2 assignments, and practical reports (40%), and an examination consisting of a 2-hour paper (60%).

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- periodic upgrading of laboratory facilities following new technology developments

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	CONTEMPORARY SOCIAL ISSUES
Module Code:	CSI 3580
NQF Level:	5
Notional Hours:	80
Contact hours:	Lectures: 1 x 1hr lectures /week for 28 weeks (28 hrs)
NQF Credits:	8
Pre-requisites:	None
Co-requisite:	None
Compulsory/Elective:	Compulsory
Semester Offered:	1 and 2

Module Aim:

The module raises awareness on the need for a personal, National and global ethics.

Learning outcomes:

Upon completion of this module, students should be able to:

1. Discuss regional, national, and global community issues
2. Discuss the transfer of up to date regional and national issues to their community.

Module Contents:

The module raises awareness on the need for a personal, national and global ethics. The main objective of the module is to help students reflect on the social moral issues: to discover themselves in a learner-centred, contextual, religious and life related setting. It also stimulates students for critical thinking and help them to appreciate their values, standards and attitudes.

Furthermore it orientates students with regards to the epidemiology of HIV/AIDS; the prevalence at the disease on Namibia, Africa and Internationally. It also informs students on the psycho social and environmental factors that contribute to the spread at the disease, the impact at HIV/AIDS on their individual lives, family and communities at large.

The unit further seeks to enhance HI V/AIDS preventive skills among students by means at paradigm shift and behaviour change and also to impart general introductory knowledge on gender, to make students aware, as well as sensitize them towards gender issues and how they affect our society, Sub-Region and continent at large.

Methods of Facilitation in Learning:

Through lectures, tutorials, presentations, case studies, illustrations, laboratory practicals, written assignments, group work, class discussions.

Assessment Strategies:

Continuous Assessment: minimum 2 tests, 2 assignments, and practical reports (100% Continuous assessment)

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- periodic upgrading of laboratory facilities following new technology developments

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module title:	INTRODUCTION TO BIOLOGY
Module Code:	BLG 3511
NQF level:	5
Notional Hours:	160
Contact hours:	Lectures: 1x 4 hrs / week for 14 weeks (56hrs) Practicals: 1x 3 hrs /week for 14 weeks (42 hrs)
Credits:	16
Pre-requisites:	None
Co-requisite:	None
Compulsory/Elective:	Compulsory
Semester Offered:	1

Module Aim:

This Module aims to introduce students to Biological Sciences considering the organization of life as well as the chemical basis of life.

Learning Outcomes:

Upon successful completion of this module, students should be able to:

1. describe the levels of organization of life, the characteristics of life, the unity and diversity of life, the function of cellular organelles and the cytoskeleton and its function
2. explain the scientific method and the difference between prokaryotic and eukaryotic cells
3. write a scientific report
4. perform basic measurements of length, mass, temperature and basic statistical measures
5. use a microscope properly as well as identify parts of a microscope and explain terms used in microscopy
6. draw scientifically any observation and calculate magnification of drawings
7. describe the contributions of Linnaeus, Bentham & Hooker, Engle r& Prantl and Bessey to classification
8. explain the differences and similarities between artificial, natural and phylogenetic classification systems as well as the advantages and disadvantages of each system with examples
9. interpret and construct a cladogram
10. explain the differences between the five kingdom and the 3 domain classification systems
11. compare concepts such as homology and analogy, diploblastic and triploblastic body cavities, radial and bilateral body symmetry, protostome and deuterostome development
12. explain bonding and uses of isotopes, describe atoms, elements, molecules etc, defining isotopes
13. describe the chemical nature of water and properties & functions of acids, bases and salts, calculating concentrations in solutions, explain the properties of water and how water can moderate temperature
14. explain the structure and formation of proteins, nucleic acids, lipids etc
15. describe the ultrastructure of plasma membrane and the process of exocytosis and endocytosis, distinguish between different solutions as well as diffusion, osmosis active transport and facilitated diffusion, explain the process of plasmolysis,
16. define cell communication, describe long and short distance communication, explain the 3 stages of signaling, illustrate various ways of transductions, describe functions of hormones, chemicals etc in cell communication
17. define meiosis and mitosis, describe the two processes, distinguish between the two, explain the significance of each
18. define genes, alleles, mutations, heterozygous and homozygous, describe the Mendelian Laws of inheritance and the chromosomal law of inheritance, use Punnet squares to determine genotypes, explain some genetic diseases, gene therapy, sex linkage and gene linkage

Module Contents:

This is an introductory biology Course that is designed to allow students to acquire a strong foundation into the biological sciences. The following topics will be covered: Basic techniques in biology such as microscopy, drawing, the scientific method and writing of scientific reports will be covered; Introduction to systems of classification (taxonomy and binomial nomenclature, including the five kingdoms and the three domain system); Organization of life (levels of organization): Molecule, organelle, cell, tissue, organ, organ system, organism, population, community, ecosystem (including the scales in ecology), biosphere; Chemical basis of life: carbohydrates, proteins, nucleic acids, lipids and fats, water; Cell biology: prokaryotic and eukaryotic cells, ultrastructure of plant and animal cells, cytoskeleton, membrane structure and function, cell cycle, cell division; Genes, chromosomes, genomes, Mendelian genetics, extensions to Mendelian genetics, chromosome theory of inheritance; Early theories on evolution, Evolution by natural selection (microevolution vs macroevolution), phylogeny and evolutionary relationships in five kingdoms. (Concepts such as homology and analogy; body

symmetry (radial, bilateral), cephalisation, body cavities: diploblastic, triploblastic (acoelomate and coelomate [deuterostomes and protostomes]) will be covered)

Emphasis will be focused on the following topics:

Cell structure

Chemistry of Life – Atoms, Interactions between atoms, chemical bonding

Water and the Biological System – Properties of water, water in biochemical reactions, acids, bases and salts

Carbon molecular diversity and organic molecules – carbon, lipids, amino acids & proteins, nucleotides & nucleic acids

Membrane structure and function – interactions with the environment, diffusion & osmosis

Introduction to cell communication – 3 stages of cell signalling & transduction

Concepts of early development of organisms & evolution–development of body structure, body cavities, principles of evolution, evidence for sources of variations

Mitosis and meiosis – structures of chromosomes, cell cycle, process of meiosis, meiosis and genetic variation

Introduction to Mendelian Genetics – Mendel’s Laws, chromosomes and inheritance, Mendelian inheritance in humans, chromosomal differences

Methods of Facilitation in Learning:

Through lectures, tutorials, presentations, case studies, illustrations, laboratory practicals, written assignments, group work, class discussions.

Assessment Strategies:

Continuous assessment 40% (60 % - minimum of 2 tests and 40% - at least 10 graded practical-reports)

Examination: 60% (1 x 3 hour examination paper)

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- periodic upgrading of laboratory facilities following new technology developments

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Lecturer: Senior Lecturer/Lecturer from Faculty of Science

Next scheduled review: 2020

Module Title:	BASIC MATHEMATICS
Module Code:	MAT 3511
NQF Level:	5
Notional Hours:	160
Contact hours:	Lectures: 4 x 1hr / week for 14 weeks (56 hrs) Tutorials: 1 x 2hr / week for 14 weeks (28hrs)
NQF Credits:	16
Pre-requisites:	NSSC Mathematics
Co-requisite:	None

Compulsory/Elective: Compulsory
Semester Offered: 1

Module Aim:

This Module aims to bridge the gap between school mathematics and higher (tertiary) mathematics.

The module focuses on the understanding of the basic principles of Mathematics where students will gain a broad and fundamental understanding of Mathematics

Learning outcomes:

Upon successful completion of this module, the student should be able to:

1. describe how to find the intersection and the union of two sets as well as the complement of a subset of a set
2. discuss how to decompose a fraction into partial fractions
3. simplify and factorize algebraic expressions and solve linear and quadratic equations and inequalities
4. find partial sums and the sums of geometric and arithmetic sequences expand algebraic expressions of the form $(a+b)^n$ for any natural number n .

Module Contents:

The module will cover the following chapters:

Sets: What is a set? Set notation, equality of sets, subsets, characterization of equality via the subset relation, empty set, power sets, Venn diagrams, intersection, union, complement, de Morgan's laws, set difference, symmetric difference, proofs of simple results on set equality.

Standard examples of sets: natural numbers, integers, rationals, real numbers, absolute value, intervals in \mathbb{R} and a bit about cardinality of sets (examples of finite, infinite, countable, uncountable sets).

Algebraic expressions: Simplification, expansion, factorization, polynomials, remainder and factor theorem, quadratic polynomial, binomial expansions, Pascal's triangle and the Binomial Theorem. Rational expressions, partial fractions will also be discussed.

Equations and inequalities: Linear equations in one-variable, simultaneous linear equations, quadratic equations, simultaneous non-linear equations, Linear inequalities, non-linear inequalities.

Trigonometry: Trigonometric ratios, angle orientation in the xy -plane, graphs of trigonometric functions, trigonometric identities, justifying (proving) equality of relatively simple trigonometric expression, sum/difference, double angle, half angle and sum to product formulas.

Sequences: Definition, notation, obtaining the general term in sequences, arithmetic sequences, geometric sequences, and recursively defined sequences.

Methods of Facilitation in Learning:

Through lectures, tutorials, case studies, written assignments, class discussions

Assessment Strategies:

Course Assessment: Continuous Assessment: 50% (minimum of 3 class tests). Examination: 50% (1 x 3-hour paper).

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: Calculator

Additional Costs: None

Next scheduled review: 2020

Module Title:	VETERINARY STRUCTURE AND FUNCTION 1: INTRODUCTION AND SKELETAL SYSTEM
Module Code:	BVM 3511
NQF Level:	5
Notional Hours:	320
Contact Hours:	14 hours of integrated theory and practicals/ week each semester
NQF Credits:	20
Pre-requisites:	None
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Aims:

This module aims to introduce terms and concepts used in describing the structure (form) and function of the domestic animals commonly encountered in Namibia. The module further aims to dwell in the basic and applied aspects of the structure and function of the skeletal system. The commonly encountered species to be dealt with include the carnivores (dog and cat), ruminants (bovine, ovine, and caprine), equine and porcine species. The module will be delivered in an integrated and coordinated manner so that the developmental (embryology), microscopic (histological), macroscopic (general gross anatomy, topographic and applied anatomy), and functional (physiological) aspects of a specific structure will be delivered within the same reasonable time period to allow the student to view the animal as an integrated unit. General basic aspects of each of the disciplines and sub disciplines mentioned above will be given before proper coordination can be achieved.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. Articulate the relationship between structure and function in domestic animals.
2. Explain how the organism is made up of cells organs and organ systems.
3. Dissect clinically relevant topographic anatomical features of the skeletal system of domestic animals.
4. Identify clinically relevant topographic anatomical features of domestic animal skeletal system in demonstration specimens.
5. Identify clinically relevant topographic anatomical features of domestic animals using palpation of the skeletal system.
6. Identify clinically relevant topographic anatomical features of domestic animal skeletal system in radiographs.
7. Demonstrate understanding of topographical anatomy application and lay foundations for some surgical procedures (orthopaedics).
8. Demonstrate understanding of topographic anatomy in application of local anaesthesia (regional nerve blocks) in domestic animals.
9. Demonstrate applications of topographic anatomy in clinical examination of the skeletal system of domestic animals.
10. Explain the concepts of cell physiology, homeostasis, regulatory mechanisms including set point, negative and positive feedback loops and compensatory responses.

11. Describe the various physiological organ-systems and their importance to the integrative functions of the animal body.
12. Explain the structure and function of bone, joints and synovial fluid – including bone formation, bone resorption and bone repair.

Module Content:

The module will comprise of

- a. Gross anatomy: Definition of anatomy and its relationship to function (physiology), the sub-disciplines, etymology, nomenclature, directional terms, planes of the body, basic movements, general and applied osteology, arthrology and syndesmology of carnivores (dog and cat), ruminants (bovine, ovine, caprine), equine and porcine species. The bones of the trunk, fore and hindlimbs will be studied by dissection or demonstration specimens where appropriate. Palpation, medical imagery (radiographs) will be introduced as a way of facilitating study of anatomy of live animals. Students are expected to integrate the knowledge between cadaver material, live animals, and medical imagery materials.
- b. Physiology: Definition and etymology of physiology (functions). General introduction - organ systems: Cell physiology, ionic composition of cellular fluid, cell membrane functions, cytoplasm, nucleoplasm; overview and integration, concept of feedback loop and homeostasis and body system integration. Physiology of bone, joints and synovial fluid.
- c. Embryology: Developmental anatomy definition and introduction to terms used in embryology. Early embryonic development including gametogenesis in the male and female; summary processes from gametogenesis to fertilization (capacitation, acrosome reaction, cortical reaction); cleavage morulation gastrulation; placentation in domestic animals; body folding; branchial arch formation, neurulation, body cavity formation. Development of the skeletal system.
- d. Histology: Definition and etymology of microscopic anatomy. Introduction to microscopy (simple light, phase contrast and electron microscopy), tissue processing (preparation, cutting, embedding H and E staining, special stain types and procedure), cell structure; subcellular and ultrastructure (cell membrane cytoplasm; nucleus). Histology of the basic tissues, epithelial, connective tissue, nervous tissue and muscle tissue.

Methods of Facilitation of Learning:

Through lectures, presentations, case studies, illustrations, laboratory practicals, written assignments, group work, class discussions.

Assessment Strategies:

Continuous Assessment: Minimum 4 theory assessments and at least 3 practical assessments

Examination: 1 x 2hr practical examination (50%) and 1 x 3hr paper (50%)

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- regular reviews of module content
- effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: Dissection instruments, rectal thermometer, stethoscope

Additional Costs: None

Next scheduled review: 2021

Module Title: VETERINARY STRUCTURE AND FUNCTION 2: CARDIOPULMONARY, LYMPHO-RETICULO-ENDOTHELIAL AND NEUROMUSCULAR SYSTEMS

Module Code:	BVM 3512
NQF Level:	5
Notional Hours:	320
Contact Hours:	14 hours of integrated theory and practicals/ week each semester
NQF Credits:	32
Pre-requisites:	None
Co-requisite:	BVM 3511 Veterinary Structure and Function 1
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Aims:

The module aims to enable students to gain an understanding of the basic and applied aspects of the structure and function of the cardiopulmonary, lympho-reticular and neuromuscular systems of domestic animals commonly encountered in Namibia. Students are expected to integrate the knowledge between cadaver material, live animals, and images. This material will be used to aid in understanding of concurrent modules in the basic sciences. Students will also learn basic skills to be used later in pathology, local anaesthesia, medical imagery, surgery, therapeutics and clinical diagnostics of these species.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. Dissect clinically relevant topographic anatomical features of the cardiopulmonary and neuromuscular systems of the domestic animal.
2. Identify clinically relevant topographic anatomical features of the cardiopulmonary and neuromuscular systems of domestic animals in demonstration specimens.
3. Identify clinically relevant topographic anatomical features of the cardiopulmonary and neuromuscular systems domestic animal using palpation, auscultation and percussion.
4. Identify clinically relevant topographic anatomical features of the cardiopulmonary and neuromuscular systems of domestic animals in radiographs.
5. Demonstrate of topographical anatomy application and lay foundations for some surgical procedures (e.g. disk prolapse and soft tissue injuries).
6. Demonstrate understanding of topographic anatomy in application of regional anaesthesia (regional nerve blocks).
7. Demonstrate understanding of topographic anatomy as applied intramuscular injection therapy.
8. Demonstrate understanding of topographic anatomy as applied to venepuncture (intravenous injection therapy).
9. Demonstrate applications of topographic anatomy in clinical examination of the cardiopulmonary and neuromuscular systems of domestic animals.
10. Describe the structural and functional organization of the nervous system – including the central and peripheral nervous systems and the autonomic nervous system.
11. Explain principles and applications of sensory physiology.
12. Discuss intracellular and extracellular communication systems.
13. Explain the structure and function of skeletal muscle – including excitation-contraction coupling, sliding filament mechanism, force generation and isometric versus isotonic contractions.
14. Explain the structure and functions of smooth muscles – including excitation-contraction coupling.

15. Explain the structure and functions of the cardiovascular system – including the mechanical and electrical properties of cardiac muscle function.
16. Discuss the excitation-contraction coupling in cardiac muscle.
17. Explain the reflex regulation of blood pressure.
18. Describe the normal composition of blood including the functions of each type of cell.
19. Describe the structure and functions of the respiratory system, including lung volumes, gas exchange, and gas transport in blood.

Module Content:

The module will comprise of

- a. Gross anatomy: Cardiopulmonary system: External nares, Nasal cavities, paranasal sinuses; nasopharynx, guttural pouches, larynx, trachea; Thorax: skeleton, muscles of respiration, cranial mediastinum (oesophagus, trachea, cranial mediastinal lymph nodes, vagosympathetic trunk, recurrent laryngeal nerve), middle mediastinum; pleura and lungs, (the heart, blood supply and great vessels of the thorax) caudal mediastinum; blood supply to the neck, head, forelimb. Thoracic wall and organs, blood supply to abdominal and pelvic organs of carnivores (dog and cat), ruminants (bovine, ovine, caprine), equine and porcine species.
Gross anatomy: Neuromuscular system; General and applied myology, the muscles of the trunk, fore and hind limbs will be studied by dissection or demonstration specimens where appropriate. Palpation, medical imagery (simple and contrast radiographs or scans) will be introduced as a way of facilitating study of anatomy of live animals. Students are expected to integrate the knowledge between cadaver material, live animals, and medical imagery materials. General introduction to the nervous system; Central nervous system; Telencephalon and diencephalon, brainstem (mesencephalon, pons, medulla), cerebellum; Spinal cord: Peripheral nervous system (cranial nerves, spinal nerves) brachial and lumbosacral plexuses. Names, courses and distribution of named nerves of the brachial plexus. Names, courses and distribution of lumbosacral plexus nerves.
- b. Physiology: Functions of the nervous system, the central and peripheral nervous systems, the autonomic nervous system, somatic nervous system, neurophysiology, the somatosensory system: olfaction, taste, hearing and equilibrium, vision. Physiology of muscle; physiology of movement: muscles, types of muscles, sliding filament theory of muscle contraction, excitation-contraction coupling, locomotion and movement coordination. Physiology of cardiovascular system; overview of cardiovascular function; blood: composition, properties and function of blood, blood circulation, physiology of lymph, medullar and synovial liquids, cardiac muscle, mechanism of cardiac contraction, heart beat and cardiac cycle, regulation of blood pressure and heart activity. Physiology of the respiratory system: organizational structure and functions, review of gas Law, breathing mechanisms, ventilation, gases exchange in the lung and in the tissue, respiratory volumes and capacities, respiratory sounds, control of respiration.
- c. Embryology: Development of the respiratory system, development of the heart and blood vessels; development of the lympho-reticular system; development of the neuromuscular system; development of the eye, development of the ear.
- d. Histology: Histology of the cerebrum, the cerebellum, peripheral ganglia nerve trunk and peripheral nerve. Histology of cardiac muscle; large, medium and small artery, histology of veins, venules and capillaries. Spleen, lymphatic vessels, lymph node and thymus. Histology of the conducting portion respiratory portion of the respiratory systems: respiratory mucosa, olfactory mucosa, the muco-ciliary clearance complex, the alveoli, the blood-air barrier.

Methods of Facilitation of Learning:

Through lectures, presentations, case studies, illustrations, laboratory practicals, written assignments, group work, class discussions.

Assessment Strategies:

Continuous Assessment: Minimum 4 theory assessments and at least 2 practical assessments

Examination: 1 x 2hr practical examination (50%) and 2 x 3hr paper (50%)

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- Module review in consultation with experts in the subject field
- Internal and external moderation of examination papers and answer scripts
- Student evaluation of the module and lecturers at the end of the semester
- Regular reviews of module content
- Effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: Dissection instruments, rectal thermometer, stethoscope

Additional Costs: None

Next scheduled review: 2021

Module Title:	COMPUTER LITERACY
Module Code:	CLC 3509
NQF Level:	5
Notional Hours:	80
Contact hours:	Lectures: 1 x 2hr / week for 14 weeks (28 hrs)
NQF Credits:	8
Pre-requisites:	None
Co-requisite:	None
Compulsory/Elective:	Compulsory
Semester Offered:	2

Module Aim:

The aim of this module is to equip the students through hands-on experience with the necessary skills to use application software: word processing, spreadsheets, databases, presentations and communications. The objective is to increase student's productivity in both the education and later, the work environment.

Learning Outcomes:

Upon successful completion of this module, students should be able to:

1. Define technology and its role in today's society
2. Identify and describe the purposes of various computer hardware components
3. Explain the role of operating systems
4. Describe the purposes of databases
5. Explain how databases work
6. Describe how computer networks are organized and how they work
7. Explain the purpose of a computer server

Module Contents:

The module covers the following topics.

Introduction to Computers: hardware and software, types and categories of computers, usage of Computer devices and peripherals.

Working with the windows operating system; File Management, working with multiple programs, and using the recycle bin.

Using a word processor: formatting a text and documents, spelling check, grammar and thesaurus tools, inserting tables, auto-shapes, clip arts, charts, and mail merge.

Spreadsheet: worksheets and workbooks, ranges, formulas and functions, creating graphs, charts, and printing the work book.

Databases: creating tables, relationships, queries, forms and reports.

Presentation software: slide layout and master, animations, auto-content wizard and templates.

Communication tools: introduction to the Internet, web browsers, search engines, downloading and uploading files, creating and sending messages, email etiquette, internet security, and digital signatures.

Methods of Facilitation in Learning:

Through lectures, tutorials, presentations, illustrations, written assignments, group work, class discussions

Assessment Strategies:

Continuous Assessment: minimum 2 tests, 2 assignments, and practical reports (40%), and an examination consisting of a 2-hour paper (60%).

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- periodic upgrading of laboratory facilities following new technology developments

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Lecturer: Senior Lecturer/Lecturer from Faculty of Science

Next scheduled review: 2020

Module Title:	VETERINARY BIOCHEMISTRY
Module Code:	BVB 3532
NQF Level:	5
Notional Hours:	160
Contact Hours:	Lectures: 4 x 1hr / week Practicals: 1 x 3hr / alternate week
NQF Credits:	16
Pre-requisites:	None
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Aims:

The module aims to acquaint students with principles of Biochemistry in the context of veterinary medicine.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. explain the role of enzymes in biological systems and discuss the factors affecting enzyme activity
2. discuss catabolic biochemical pathways that take place in living tissues to provide energy in the form of ATP, such as glycolysis, TCA cycle, and the Cori cycle
3. discuss anabolic biochemical pathways such as the pentose phosphate pathway (PPP) and gluconeogenesis
4. apply the laws of thermodynamics
5. Explain the metabolism, its regulation and importance to the physiological condition of an organism
6. Explain the biochemical basis of selected metabolic diseases in animals

Module Content:

The module will focus on the following topics:

Enzymology: Enzymes as organic catalysts; enzyme nomenclature; factors affecting activities of enzymes; enzyme kinetics - the Michaelis-Menten equation; the Lineweaver-Burk plot; enzyme inhibition; allosterism.

Bioenergetics and thermodynamics: free energy, laws of energy, activation energy, transition states, endergonic and exergonic reactions.

Metabolism: Catabolism and anabolism: carbohydrate catabolism (glycolysis, alcohol and metabolism of lactic acid, tricarboxylic acid cycle or the TCA cycle; electron transport chain and oxidative phosphorylation); regulation of carbohydrate metabolism; gluconeogenesis; synthesis of the disaccharides (lactose and sucrose); synthesis of polysaccharides (starch and glycogen); lipid metabolism (β -oxidation, malonyl CoA); integration of carbohydrate and fat metabolism; amino acids and protein metabolism; urea cycle; the Cori cycle; pentose phosphate pathway. Metabolic diseases especially those related to the digestion in ruminants will also be discussed.

Methods of Facilitation of Learning:

Through lectures, tutorials, laboratory practicals

Assessment Strategies:

Continuous Assessment: Minimum 2 theory assessments and at least 5 practical assessments

Examination: 1 x 3hr

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- Regular reviews of module content
- Effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	VETERINARY GENETICS
Module Code:	BVM 3542
NQF Level:	5
Notional Hours:	80
Contact Hours:	Lectures: 2 x 1hr / week Practicals: 1 x 3hr / alternate week
NQF Credits:	8
Pre-requisites:	None
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Aims:

This module aims to provide an overview of introductory aspects of genetics that are relevant to veterinarians by covering a variety of topics that include chromosomal abnormalities, heritability, inbreeding and control of inherited diseases.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. describe the single gene and chromosomal disorders
2. discuss selection and mutation and the selection and crossing of genes
3. apply the Hardy-Weinberg law in analysing population genetics
4. discuss familial and inherited disorders in selected farm animals
5. discuss the genetic and environmental control of inherited diseases
6. discuss the impact of inbreeding and cross breeding in production animals
7. discuss the heritability; breed history and structure of different production animal breeds
8. discuss selection, crossing and inbreeding
9. explain the genetic variations in different animals
10. explain the basis of genetic resistance to animal diseases
11. discuss the importance of conservation genetics
12. discuss how genetics influence coat colours of animals
13. discuss genetic biotechnology
14. discuss clinical genetics
15. describe advanced techniques in applied genetics

Module Content:

This module introduces and presents principles and methods used in the study of veterinary genetics. The emphasis throughout is on application of concepts to solve problems. It covers the creation and use of genome assemblies and genetic maps; single-locus traits and disorders; chromosomal abnormalities; non-Mendelian familial disorders; immune-genetics; parentage tests; conservation genetics; Genetic basis of resistance to diseases; genetic and environmental control of inherited diseases; relationship and inbreeding; heritability; breed history and structure; selection and crossing; genetics of coat colours; genetic biotechnology; clinical genetics; applied population genetics, introduction to advanced genetic techniques in applied genetics.

Methods of Facilitation of Learning:

Through lectures, practicals, and class discussions

Assessment Strategies:

Continuous Assessment: minimum 2 theory assessments and at least 3 marked practical assessment

Examination: 1 x 2 hr paper

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- Regular reviews of module content
- Effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	ANIMAL ETHOLOGY and WELFARE
Module Code:	BVM 3671
NQF Level:	6
Notional Hours:	80
Contact hours:	Lectures: 2 x 1hr / week Practicals: 1 x 3hr / alternate week
NQF Credits:	8
Pre-requisites:	None
Co-requisite:	None
Compulsory/Elective:	Compulsory
Semester Offered:	1

Module Aims:

This module aims to highlight behavioural responses of animals to stressors related to husbandry, housing, transport, slaughter, training and performance. Current animal welfare matters according to OIE recommendations and legislation on animal welfare in Namibia will be discussed.

Learning outcomes:

Upon completion of this module, the student should be able to:

1. describe mechanical restraint and handling of selected domestic animals
2. describe the flight zone and point of balance for low stress handling of cattle, sheep, and pigs
3. define animal ethology and differentiate between behavioural studies
4. differentiate and describe the major types of behaviour in domestic animals
5. describe current animal welfare considerations as stipulated in the OIE recommendations, including the Five Freedoms
6. discuss the physiological and behavioural factors that assist in assessing welfare of animal
7. discuss the welfare of working animals
8. consistently display safe and systematic competence in animal handling
9. discuss principles and ethical requirements for animal slaughter and euthanasia
10. discuss animal protection and welfare legislation in Namibia
11. Identify and describe selected breeds of canines and equines

Module Contents:

Animal Ethology: The module deals with the behavioural adaptations of domestic animals to their environment as well as appropriate animal restraining and handling practises. The module will cover a brief history of the study of animal ethology, the interpretation of animal behaviour, and the major types of behaviour in domestic animals.

Animal Welfare: The module covers different aspects of animal welfare science with reference to the Five Freedoms and OIE animal welfare recommendations. The behavioural factors that affect the welfare of animal will be highlighted. Animal husbandry issues such as housing, handling, and basic aspects of nutrition of animals will be discussed, with relevance to their impact on the welfare of animals. The module will also focus on the introduction to animal welfare ethics, influence of transport and the marketplace on animal welfare, ethics and principles of euthanasia. The current relevant Namibian animal protection and welfare legislation and the role of the welfare organisations will be assessed and evaluated. The module will further highlight the role veterinarians play in delivering services that enhance the welfare of animals.

Methods of Facilitation in Learning:

Through lectures, practicals, field excursions and class discussions

Assessment Strategies:

Continuous Assessment: minimum 3 theory assessments and at least 3 marked practical assessments

Examination: 1 x 2hr paper

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- periodic upgrading of laboratory facilities following new technology developments

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: none

Additional Costs: Protective clothing

Next scheduled review: 2020

Module Title:	VETERINARY MICROBIOLOGY
Module Code:	BVC 3611
NQF Level:	6
Notional Hour:	80
Contact Hours:	Lectures: 4 x 1hr / week Practicals: 1 x 3hr / alternate week
NQF Credits:	16
Pre-requisites:	BLG 3511 Introduction to Biology
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Aims:

This module will provide the students with a general overview of veterinary microbiology including systematics and taxonomy to serve as a basic foundation for correct diagnosis of bacterial, viral and fungal diseases of domestic and wild animals. The module will also avail the students with the practical knowledge on the preparation of different types of culture media used in the isolation of pathogenic bacteria. Additionally the course emphasizes on the importance of provision of proper laboratory management and control of diseases of public health importance and endows students with the necessary skills to perform relevant laboratory diagnostic tests.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. discuss the main milestones and scientists in the history of microbiology
2. outline the systematics, taxonomy classification, nomenclature and structure of bacteria, fungi and viruses
3. describe disease producing mechanisms of microbial pathogens including bacteria, fungi and viruses
4. discuss the mode of multiplication, nutrition, growth, genetics of microbial pathogens
5. describe the preparation and use of different types of culture media used in the isolation of pathogenic bacteria
6. outline the basic processes involved in the pathogenesis of bacterial, fungal and viral diseases
7. explain the mechanism of action of antimicrobial agents and how bacteria (and other microorganisms) may resist their action
8. collect appropriate samples for microbiological analysis
9. handle clinical samples safely in a laboratory and carry out elementary microbiological procedures
10. perform basic relevant laboratory diagnostic tests
11. discuss the importance of microorganisms in human and animal health and their application in industry and impact on ecology

Module Content:

The module will cover the following:

General microbiology and bacteriology: Introduction and history of microbiology, morphology, structure, growth and nutrition of bacteria, systematics, taxonomy including classification and nomenclature of bacteria, microbial ecology, control of microorganisms, pathogenicity, virulence and infection; endotoxins and exotoxins; bacterial genetics, plasmids and antibiotic resistance.

Diagnostic microbiology: Equipment, sterilization, disinfection and asepsis, staining, bacterial motility, biochemical test, preparation of culture media, aerobic and anaerobic cultivation, isolation of bacteria in pure culture, morphological and cultural characteristics, biochemical characteristics, antibiogram and slide culture technique for fungus

Mycology: Introduction, taxonomy, classification of fungi, morphology, growth, nutrition and reproduction in fungi.

Virology: Introduction to viruses, systematics, taxonomy and classification of viruses, general properties, strategy of replication and the viral transmission mechanisms in each viral family, cultivation and purification of viruses, cell-virus interactions, viral genetics and interferon. Prions and prion diseases and their implication on veterinary public health.

Methods of Facilitation of Learning:

Through lectures, class discussions and practicals

Assessment Strategies:

Continuous Assessment: minimum 2 theory assessments and at least 5 marked practical assessments

Examination: 1 x 3 hr Theory paper

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title: VETERINARY STRUCTURE AND FUNCTION 3: DIGESTIVE SYSTEM AND THERMOREGULATORY SYSTEMS

Module Code: BVM 3631

NQF Level: 6

Notional Hours: 320

Contact Hours: 14 hours of integrated theory and practicals/ week each semester

NQF Credits: 32

Pre-requisites: Veterinary Structure and Function 1 and 2

Co-requisite: Veterinary Structure and Function 4

Compulsory / Elective: Compulsory

Semester Offered: 1

Module Aims:

The module aims to enable students to gain an understanding of the basic and applied aspects of the structure and function of the digestive and thermoregulatory systems of domestic animals. Students are expected to integrate the knowledge between cadaver material, live animals, and radiographic images. This material will be used to aid in understanding of concurrent modules in the basic sciences. Students will also learn basic skills to be used later in pathology, local anaesthesia, medical imagery, surgery, therapeutics and clinical diagnostics of these species.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. Dissect clinically relevant topographic anatomical features of the digestive and integumentary systems of domestic animals.
2. Identify clinically relevant topographic anatomical features of domestic animals in demonstration specimens.
3. Identify clinically relevant topographic anatomical features of the digestive and integumentary systems of domestic animal using palpation, auscultation and percussion.
4. Identify clinically relevant topographic anatomical features of the digestive and integumentary systems of domestic animals in radiographs.
5. Demonstrate understanding of topographical anatomy application and lay foundations for some surgical procedures in the head (dental work, naso-gastric tubes), abdomen (laparotomy, gastritis, colic, bloat, resection/anastomosis) and integument.
6. Demonstrate applications of topographic anatomy in clinical examination of the digestive and integumentary systems of domestic animals.
7. Discuss the characteristics and comparative physiology of the digestive system of domesticated animals.

8. Discuss gastro-intestinal motility, secretory functions of gastro-intestinal tract, their regulation and gastro-intestinal hormones.
9. Describe and compare absorption, metabolism and excretion of various nutrients, appetite and control of feed intake in relevant species.
10. Describe the structure and functions of skin with regard to temperature regulation and physiological response to the environment.
11. Explain the physiological control of body temperature in health and disease situations.

Module Content:

The module will comprise of

- a. Gross anatomy, Digestive system: Mouth, Oral vestibule. Oral cavity proper, teeth (general structure and aging), tongue; pharynx (general and comparison of horse and cattle); salivary glands, muscles of mastication, deglutition. Esophagus (e.g. potato and fruit potential for chocking in cattle and horses, and persistent right aortic arch in dogs). Stomach (dog, horse, pig, cow, sheep and goat). Abdominal wall and abdominal topography. Liver, pancreas. Gross anatomy, Integumentary system; Skin; epidermal structures; horn, hooves, nails. Skin glands.
- b. Physiology: Functions of the physiology of digestive system: review of gastrointestinal tract (GIT), main functions of digestive system, accessory digestive organs and glands, digestive phenomenon of monogastric and polygastric animals; regulation of the gastrointestinal tract functions. Temperature regulation in health and disease situations – Functions of the skin: endothermic, poikilothermic and homoeothermic animals, body temperature regulation, animal physiological response to cold and hot environment, animal adaptation to hot climate, water and mineral balance.
- c. Embryology: Development of the digestive system (emphasis of the simple and ruminant stomach, the ascending colon in the dog, ruminant and horse), salivary glands, liver and pancreas, development of the integumentary system including nails, hooves, horns.
- d. Histology: Histology of the digestive system; mouth, dental pad, teeth, salivary glands esophagus, simple stomach, rumen, reticulum, omasum, abomasum, liver, pancreas, duodenum, jejunum, ileum, caecum, colon and anal canal.

Methods of Facilitation of Learning:

Through lectures, presentations, case studies, illustrations, laboratory practicals, written assignments, group work, class discussions.

Assessment Strategies:

Continuous Assessment: Minimum 4 theory assessments and at least 3 practical assessments

Examination: 1 x 2hr practical examination (50%) and 2 x 3hr paper (50%)

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- Module review in consultation with experts in the subject field
- Internal and external moderation of examination papers and answer scripts
- Student evaluation of the module and lecturers at the end of the semester
- Regular reviews of module content
- Effective supervision and monitoring of assignments, tests and examinations

Module requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: Dissection instruments, rectal thermometer, stethoscope

Additional Costs: None
Next schedules review: 2021

Module Title:	VETERINARY PARASITOLOGY I
Module Code:	BVM 3651
NQF Level:	6
Notional Hours:	160
Contact Hours:	Lecture: 2 x 2hrs / week Practical: 1 x 3 hrs / every alternate week
NQF Credits:	16
Pre-requisites:	BLG 3511
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module aims:

This module focuses on helminth endoparasites of veterinary importance in Namibia and southern Africa, their biology, identification, transmission and control strategies as well as resulting diseases and economic losses caused.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. Recognize the various classes of parasites
2. Describe the pathologic and economic effects of selected helminth endoparasites
3. Recommend methods and strategies for controlling or minimizing helminth infection, both in the individual animal and on a herd basis
4. Identify representative helminth species using various laboratory and field techniques
5. Describe the life cycles of helminth parasites, as well as disease manifestations in the host species.

Module Content:

In this module students will be introduced to general parasitology, including the major helminth endoparasites of veterinary importance in Namibia, and more broadly in southern Africa. The following topics will be specifically covered:

General parasitology: Parasites and parasitism, types of hosts, host-parasite relationships; mode of transmission of parasites and methods of dissemination of the infective stages of the parasite, parasite specificity in relation to species, breed, sex and location, immunity against parasitic infestations.

Helminthology: Classification of helminths, characteristics of main groups, life cycle of helminths in relation to transmission, pathogenesis, epidemiology, economic impacts and general control measures of trematodes, cestodes and nematodes of veterinary importance in the region. The diagnosis, treatment and prevention of diseases caused by helminths will also be discussed, as well as non-chemical control methods of endoparasites.

Methods of Facilitation of Learning:

Through integrated lectures, practicals, class discussions

Assessment Strategies:

Continuous Assessment: Minimum 2 theory assessments and at least 5 marked practical assessments

Examination: 1 x 2 hrs practical examination (40%) and 1 x 3 hrs theory paper (60%)

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- Regular reviews of module content
- Effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	VETERINARY IMMUNOLOGY AND VACCINOLOGY
Module Code:	BVM 3602
NQF Level:	6
Notional Hours:	80
Contact Hours:	Lectures: 2 x 1hr / week Practicals: 1 x 3hr practical / alternate week
NQF Credits:	8
Pre-requisite:	None
Co-requisites:	BVC 3611 Veterinary Microbiology
Compulsory / Elective:	Compulsory
Semester Offered:	2

Course Aims:

This module provides a short overview of veterinary immunology and vaccinology. It is designed to provide the student with an understanding of the basic principles and mechanisms underlying the immune system, with emphasis on the interaction between innate and acquired immunity in the response to infection.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. Distinguish between immunology and vaccinology
2. Describe the innate and adaptive immune systems and the major components of each
3. Explain how the immune system recognizes and responds to infectious agents and provides protection from disease
4. Explain unique characteristics associated with immune mechanisms of neonates
5. Describe the basic immune mechanisms associated with allergies, autoimmune disease, and adverse vaccine reactions.
6. Distinguish between diagnostic tests for antigens and antibodies
7. Interpret the results of serological tests
8. Discuss the advantages and disadvantages of different types of veterinary vaccines
9. Discuss the general reasons for vaccine failure
10. Discuss factors influencing the duration of immunity
11. Discuss factors that determine the quality of a vaccine

Module Content:

The module will cover the following topics: History and definition of concepts, types of immunity, tissues, organs and cells of the immune system, antigens and immunogenicity, antibodies and their interactions, Immune dysfunction including: autoimmunity and autoimmune diseases, immune response to bacterial, fungal, viral and parasitic infections; relationship between immunology and vaccinology, the general principles of immunization and vaccines, types of vaccines, composition and development, factors affecting vaccine efficacy; vaccine preventable diseases, vaccination policy and immunization schedules with reference to Namibia.

The practical sessions will introduce students to blood collection and serum processing, applications of immunology: immuno-serological reactions, vaccination and other immunization techniques, as well as serological diagnosis of common animal diseases encountered in Namibia.

Methods of Facilitation of Learning:

Through lectures and practicals

Assessment Strategies:

Continuous Assessment: minimum 2 theory assessments and at least 3 marked practical assessments

Examination: 1 x 2hr paper

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- Regular reviews of module content
- Effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	VETERINARY STRUCTURE AND FUNCTION 4: UROGENITAL AND ENDOCRINE SYSTEM
Module Code:	BVM 3632
NQF Level:	6
Notional Hours:	320
Contact Hours:	14 hours of integrated theory and practicals/ week each semester
NQF Credits:	32
Pre-requisites:	Veterinary Structure and Function 1 and 2
Co-requisite:	Veterinary Structure and Function 3
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Aims:

The module aims to enable students to gain an understanding of the basic and applied aspects of the structure and function of the urogenital and endocrine systems of domestic animals commonly encountered in Namibia. Students are expected to integrate the knowledge between cadaver material, live animals, and images. This material will be used to aid in understanding of concurrent modules in the basic sciences. Students will also learn

basic skills to be used later in pathology, local anaesthesia, medical imagery, surgery, therapeutics and clinical diagnostics of these species.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. Dissect clinically relevant topographic anatomical features of the urogenital and endocrine systems of domestic animals.
2. Identify clinically relevant topographic anatomical features of the urogenital and endocrine systems of domestic animals in demonstration specimens.
3. Identify clinically relevant topographic anatomical features of the urogenital and endocrine systems of domestic animals using palpation and auscultation.
4. Identify clinically relevant topographic anatomical features of the urogenital and endocrine systems of domestic animals in radiographs.
5. Demonstrate understanding of topographical anatomy application and lay foundations for some surgical procedures in the pelvis (e.g. hysterectomy, Caesarean section, urolithiasis, breeding soundness examination, pregnancy diagnosis) and perineum.
6. Demonstrate understanding of topographic anatomy in application of regional anaesthesia (e.g. regional nerve blocks, epidural)
7. Demonstrate understanding of topographic anatomy as applied to laparotomy, Caesarean section, perineal surgery.
8. Demonstrate applications of topographic anatomy in clinical examination of the urogenital and endocrine systems of domestic animals
9. Describe the structure and functions of the kidney, nephrons - including glomerular filtration, tubular reabsorption, tubular secretion, and excretion.
10. Describe the regulation of acids and bases in the body.
11. Explain the functions of the endocrine system with focus on the functions of each type of cell – including the hypothalamus and the pituitary glands, thyroid and parathyroid glands, adrenal glands, endocrine pancreas and mammary gland.
12. Describe the structure and functions of the male and female reproductive systems including species differences where relevant.

Module Content:

The module will comprise of

- a. Gross anatomy: Urinary system: General gross and topographic anatomy of the kidney, ureters, urinary bladder and urethra. Gross anatomy male reproductive system, gross and topographic anatomy of the testis, ductus deferens, accessory sex glands (ampulla of ductus deferens, vesicular glands, prostate glands and bulbourethral glands) penis and prepuce of the domestic animals commonly encountered in Namibia. Gross anatomy of the female reproductive system; ovaries, uterine tube, uterus, vagina vestibule, vulva and mammary glands of carnivores, ruminants, horses and pigs. Gross anatomy of the adenohypophysis gland.
- b. Physiology: Physiology of the excretory system: organizational structure and functions of the kidney, urine formation, glomerular filtration rate, secretion and excretion of metabolites, control of water and electrolytes. Regulation of acid base balance. Physiology of the endocrine system, endocrine glands, functions of the endocrine system, systemic effects of main hormones, the renin-angiotensin-system; endocrine versus nervous system regulation; reproductive system: genital glands, oestrus cycle and mammary gland.
- c. Embryology: Development of the urinary system, development of the reproductive system male and female. Development of thyroid gland and adenohypophysis.

- d. Histology: Histology of the kidney, ureters, urinary bladder and urethra. Histology of the male reproductive system, testis, ductus deferens, accessory sex glands (ampulla of ductus deferens, vesicular glands, prostate glands and bulbourethral glands), penis of the domestic animals commonly encountered in Namibia. Histology of the female reproductive system; ovaries, uterine tube, uterus, vagina vestibule, vulva and mammary glands of carnivores, ruminants, horses and pigs. Gross anatomy of the adenohiphophysis gland.

Methods of Facilitation of Learning:

Through lectures, presentations, case studies, illustrations, laboratory practicals, written assignments, group work, class discussions.

Assessment Strategies:

Continuous Assessment: Minimum 4 theory assessments and at least 3 practical assessments

Examination: 1 x 2hr practical examination (50%) and 2 x 3hr paper (50%)

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- Module review in consultation with experts in the subject field
- Internal and external moderation of examination papers and answer scripts
- Student evaluation of the module and lecturers at the end of the semester
- Regular reviews of module content
- Effective supervision and monitoring of assignments, tests and examinations

Module requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: Dissection instruments, rectal thermometer, stethoscope

Additional Costs: None

Next schedules review: 2021

Module Title:	VETERINARY PARASITOLOGY II
Module Code:	BVM 3652
NQF Level:	6
Notional Hours:	160
Contact Hours:	Lectures: 2 x 2 hrs / week Practicals: 1 x 3 hrs every alternate week
NQF Credits:	16
Pre-requisites:	BLG 3511 Introduction to Biology
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Aims:

The first part of the module (entomology) focuses on ectoparasites playing a role in transmission of protozoan and rickettsial diseases as well as the impact of important ectoparasites (insects and acarines) on health and well-being of domestic, wild and companion animals. The second part (protozoology and rickettsiae) focuses on protozoan parasites and rickettsial organisms with regard to the respective diseases of veterinary relevance in Namibia and southern Africa as well the strategies for their control. Where applicable, the impact on human health will also be discussed in both fields.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. Recognize and identify the various classes of protozoa and important genera of rickettsiae as well as those of ectoparasites (insects and acarines)
2. Describe the life cycles and disease manifestations of different ectoparasites as well as
3. clinically relevant genera/species of protozoa and rickettsiae including the role of their vectors respectively intermediate hosts
4. Describe relevant disease manifestations of protozoan/rickettsial and ectoparasitic diseases in the animal host species (livestock as well as companion animals and wildlife)
5. Discuss the economic effects and public health implications of selected protozoan/rickettsial diseases and ectoparasitic infestations
6. Recommend methods and strategies for control, prevention or minimizing protozoan/rickettsial infection and ectoparasitic infestations, both in the individual animal and on a herd basis
7. Identify representative protozoan/rickettsial and ectoparasite species using laboratory and field techniques, recommend further appropriate diagnostic laboratory methods
8. Discuss the use of various chemicals and anti-parasitic drugs in the control of ectoparasites and the role and importance of biological control methods

Module Content:

Veterinary ectoparasites (e.g., mosquitoes, biting flies, fleas, lice, ticks and mites) relevant to Namibia and southern Africa will be studied. The module will cover the morphology and biology of various arthropod ectoparasites and concentrate on the life cycle, diagnosis and control of selected species. An emphasis will be put on the relevance of ectoparasites as vectors and/or intermediate hosts of protozoan/rickettsial diseases and economic importance as well as impact on humans will be discussed. Particular attention will be paid to the effects of chemical anti-parasitic drugs on the environment, and ways to minimise this will be studied. The role and importance of biological control methods will also be discussed. Furthermore, students will be introduced to the general protozoology, as well to major protozoa and rickettsiae of veterinary importance in Namibia, and more broadly in southern Africa. The following topics will be specifically covered: Types and classes of protozoa as well as selected genera and species of rickettsiae, their life cycles and ways of reproduction; types of hosts and vectors, role and importance of the intermediate host; the complex relationship between parasite, intermediate host and final host; mode of transmission of protozoa and rickettsiae, methods of dissemination of the infective stages, pathogenesis, diagnosis, control and prevention of protozoan and rickettsial diseases of veterinary importance.

Methods of Facilitation of Learning:

Through integrated lectures and practicals, class discussions

Assessment Strategies:

Continuous Assessment: Minimum 2 theory assessments and at least 5 marked practical assessments

Examination: 1 x 2 hrs practical examination (40%) and 1 x 3 hrs theory paper (60%)

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- regular reviews of module content
- effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title: ANIMAL NUTRITION AND PASTURE SCIENCE

Module Code: BVM 3612

NQF Level: 6

Notional Hour: 160

Contact Hours: Lecture: 4 x1hr / week
Practical: 1 x 3 hrs / alternate week

NQF Credits: 16

Pre-requisites: BVM 3511 Veterinary Structure and Function 1
BVM 3512 Veterinary Structure and Function 2
BVB 3532 Veterinary Biochemistry

Co-requisite: None

Compulsory / Elective: Compulsory

Semester Offered: 2

Module Aims:

This module covers basic concepts in animal nutrition and analytical techniques used in assessing the feeding value of various rations and pastures of production animals including poultry. The module will also acquaint students with feed formulation and pasture management. Furthermore, the module introduces students to variable environmental conditions affecting natural and planted pastures. The nutritional requirements of companion animals (dogs, cats, horses and cage birds) will also be covered.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. Discuss the different livestock feed resources in Namibia.
2. Discuss the importance of major feed nutrients to production and companion animals.
3. Discuss the application of feed analysis and evaluation to livestock production.
4. Discuss vitamin and mineral supplementation
5. Formulate nutritional feeding programs in livestock
6. Discuss the common nutritional imbalances in selected animals
7. Discuss factors affecting nutritive value of feedstuffs
8. Design feed formulation schemes according to species needs
9. Discuss the impact of animals, fires and climate on pastures for them to remain vigorous and productive under natural conditions
10. Discuss the causes of pasture degradation
11. Discuss the role of plants, rangelands and herbivores in the production of biogas and its economic benefits
12. Recommend the level of intensity of management for different rangelands based on carrying capacity
13. Formulate a holistic approach to pasture management and utilization
14. Analyse animal feeds using different techniques

Module Content:

This module acquaints students with animal nutrition including key concepts and terminologies and the role of animal nutrition. It exposes students to different topics relating to animal nutrition of various production and companion animals. This includes laboratory feeds analysis and feed evaluation; general comparison of plants and other sources of nutrients, animal feeds; plants as feed sources with special focus on nutritive values, availability, affordability; feed fractions and their nutritional implications; digestibility and degradability experiments; different techniques used for feed analysis ; use of feed value estimates; mineral and vitamin nutrition; forage and hay quality; utilization of rangelands by herbivores; management options; concept of rotational grazing. Application of appropriate measures towards preservation of nutritive value of pastures, hay and forages; feed formulation based on animal nutritional requirements; the concept of palatable and non-palatable pastures adapted to the Namibian climatic conditions; establishment of perennial and annual pastures; natural and planted pastures, utilization and management. The module will further cover nutritional imbalance disorders including metabolic diseases and their management.

Methods of Facilitation of Learning:

Lectures, assignments, field excursions

Assessment Strategies:

Continuous Assessment: minimum 2 theory assessments and at least 3 marked practical assessments

Examination: 1 x 3hr paper

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- regular reviews of module content
- effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	ANIMAL PRODUCTION
Module Code:	BVM 3622
NQF Level:	6
Notional Hours:	80
Contact Hours:	Lecture: 2x 1hrs / week Practicals: 1 x 3hrs / alternate week
NQF Credits:	8
Pre-requisites:	None
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Aims:

This module is aimed at providing students with understanding, knowledge and skills required for the livestock industry in the Namibian economy. It will also cover managerial tools aiming at effective livestock production, and livestock marketing channels and livestock by-products.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. Discuss the distribution of livestock in Namibia,
2. Discuss the importance and contribution of the livestock sector to the Namibian economy
3. Discuss production systems applied in Namibia
4. Describe breeds of production animals and the respective acclimatization abilities and traits of each breed
5. Discuss the effect of different climatic conditions on livestock production
6. Discuss the important husbandry/management practices and principles for major livestock species (beef cattle, dairy cattle, sheep, goats, poultry and pigs).
7. Identify livestock products markets and schemes in Namibia, regionally and internationally;
12. Discuss marketing, marketing channels, and animal transportation to the market
13. explain the relative importance and control of diseases with economic and trade implications
14. discuss the importance of the livestock identification and traceability system in Namibia (NamLITS)

Module Content:

The module will cover the following topics: the distribution of livestock in Namibia; livestock breed characteristics (cattle, pigs, goats, sheep and poultry) farmed in Namibia; the importance of livestock for the Namibian economy; livestock production systems applied in Namibia; important husbandry/management practices and principles for major livestock species (beef cattle, dairy cattle, sheep, goats, poultry and pigs); livestock and livestock by-products markets, marketing channels; identification and traceability (NamLITS), and transportation, Namibia's livestock trade and trading partners; opportunities and challenges in the livestock industry particularly in Namibia.

Methods of Facilitation of Learning:

Through lectures, assignments and field excursions

Assessment Strategies:

Continuous Assessment: minimum 2 theory assessments and at least 3 marked practical assessments

Examination: 1 x 2 hr paper

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- regular reviews of module content
- effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title	BIOMETRY
Module Code:	BVM 3642
NQF Level:	6
Notional Hours:	120
Contact Hours:	Lectures: 3 x 1hr / week Tutorials: 1 x 1.5 hr / week
NQF Credits:	12
Pre-requisites:	MAT 3511 Basic Mathematics
Co-requisite	None
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Aims:

This module aims to teach students to apply appropriate statistical tests to their data sets, and be able to correctly interpret statistical analyses. This module will take a practical approach to statistics that, while covering the mathematical bases of biostatistics, will predominantly focus on the implementation and interpretation of statistical tests.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. distinguish between different sampling methods and sources of data
2. Apply probability sampling techniques in selecting representative samples and collect data through measurement and experimentation
3. differentiate between types of data
4. collate, summarise, analyse, interpret and present statistical animal health data including presentation of data using statistical software
5. describe and apply different types of descriptive measurement statistics to summarise research data
6. use scientific calculators and computer software for statistical manipulation
7. Apply statistical analysis in biological research data including hypothesis testing

Module Content:

The following topics will be covered in this module:

Introduction to Biometry, types of data, random sampling; hypothesis testing; central tendency and variance; single samples, power analysis and data transformation; probability; inferences for one sample; summarizing and describing data; the two sample problem; contingency tables; introduction to non-parametric methods; the analysis of count data; Regression and correlation analysis, analysis of variance (ANOVA)

Statistics: Descriptive, inferential; variables; qualitative versus quantitative; Data types: Primary versus secondary, categorical versus discrete, continuous; Sources of data: Population versus sample; types of measurements: Nominal, ordinal, Interval, ratio scales;

Presentation of data: Tabular forms and graphical methods: histograms, pie charts, bar charts, frequency polygons, ogives, stem-and-leaf plots, box –and-whiskers plots; Measures of central tendency: Z notation, mean, median, mode, quartiles, percentiles; Measures of dispersion: Variance, standard deviation, range, inter-quartile range, skewness and kurtosis; Identification of outliers: Use of scientific calculators and computer software for statistical manipulation, Application of statistical analysis in biological research.

Methods of Facilitation of Learning:

Through lectures and tutorials

Assessment Strategies:

Continuous Assessment: minimum Two tests (15%), Two Practical exercises (15%), Two assignments (10%)

Examination: 1 x 3 hr paper

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- Regular reviews of module content
- Effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Statistical tables

equipment to be bought: Calculator, computer / laptop Additional Costs: None

Next scheduled review: 2020

Module Title:	FIELD PRACTICAL TRAINING: Laboratory
Module Code:	BVM 3689
NQF Level:	6
Contact hours:	1 week
NQF Credits:	4
Pre-requisites:	None
Co-requisite:	None
Compulsory/Elective:	Compulsory
Semester Offered:	1 or 2

Module Aim:

This module is designed to expose students to practical experience of actual veterinary operations in a veterinary diagnostic laboratory

Learning outcomes:

Upon successful completion of this module, the student should be able to:

1. Demonstrate practical skills related to laboratory diagnosis of different diseases
2. interact with veterinarians and laboratory scientists
3. Apply and appreciate new developments in technology and limitations in the field

Module Contents:

Students will be attached to veterinary diagnostic laboratories to participate in daily activities and management of operations.

Methods of Facilitation in Learning:

On-the-job training and mentorship approach, apply knowledge and concepts through problem solving, 100% attendance and compulsory participation in daily activities

Assessment Strategies:

Continuous Assessment: 100%

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field

Requirements:

Equipment to be bought: None

Additional Costs: Departmental Budget for field attachments

Lecturer: N/A

Next scheduled review: 2020

Module Title	VETERINARY GENERAL SURGERY
Module Code:	BVM 3701
NQF Level:	7
Notional Hours:	80
Contact Hours:	2 x 1hr / week Practicals: 1 x 3hr practical every 2nd week
NQF Credits:	8
Pre-requisites:	BVM 3631 Veterinary Structure and Function 3 BVM 3632 Veterinary Structure and Function 4
Co-requisites:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Aims:

The module also aims to introduce students to the disciplines of veterinary surgery, focusing on common domestic animals.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. Discuss selected bandaging techniques
2. Differentiate between the various surgical instruments and understand their use
3. Apply selected suture techniques to models/cadavers
4. Apply selected haemostasis techniques to models/cadavers
5. Apply aseptic techniques in preparation of the surgeon and patient
6. Discuss principles of wound management and healing

Module Content:

General surgery: This introductory module will cover the basic principles of modern veterinary surgery, including asepsis, wound healing, suture materials, suture patterns, haemostasis and surgical instrumentation. This module will also include bandaging.

Methods of Facilitation of Learning:

Through lectures, case studies and practicals. Lecture can be delivered face-to-face or online.

Assessment Strategies:

Continuous Assessment: Minimum of 2 theoretical assessments and 1 marked assignment.

Examination: 1 x 2 hour theory paper.

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- regular reviews of module content
- effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title	VETERINARY DIAGNOSTIC IMAGING
Module Code:	BVM 3731
NQF Level:	7
Notional Hours:	80
Contact Hours:	2 x 1hr / week ; 1 x 3hr practical every 2nd week
NQF Credits:	8
Pre-requisites:	BVM 3631 Veterinary Structure and Function 1 BVM 3632 Veterinary Structure and Function 2
Co-requisites:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Aims:

The module also aims to introduce students to the discipline of veterinary diagnostic imaging, including radiography and ultrasound, focusing on common domestic animals.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. Discuss the principles and use of diagnostic imaging (including radiography and ultrasound), including radiations safety
2. Explain positioning, including terminology, of x-ray views of selected domestic animal species for basic routine radiographs
3. Relate radiographic images to topographical anatomy in different species
4. Recognise the major abdominal organs of dogs and cats using ultrasound
5. Recognise artefacts on radiographic and ultrasound images

Module Content:

Introductory lectures will focus on radiographic and ultrasonographic equipment, radiation safety, production of diagnostic quality radiographs and ultrasound images. Basic principles of interpretation of radiographs and ultrasound images will be covered.

Methods of Facilitation of Learning:

Through lectures, case studies and practicals. Lectures can include both face-to-face and online teaching methods

Assessment Strategies:

Continuous Assessment: Minimum of 2 theoretical assessments and 1 marked assignment.

Examination: 1 x 2 hour theory paper.

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- regular reviews of module content
- effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	HERD HEALTH MANAGEMENT AND ECONOMICS I
Module Code:	BVM 3721
NQF Level:	7
Notional Hour:	80
Contact Hours:	Lecture: 2x 1hr / week Practicals: 1x3 hrs/ alternate week
NQF Credits:	8
Pre-requisites:	BVM 3651 Veterinary Parasitology I BVM 3622 Animal Production BVM 3602 Veterinary Immunology and Vaccinology
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Aims:

The module introduces principles of herd health and reproduction management in order to optimize production and health in beef cattle and small stock. Biosecurity measures will also be addressed. The module also aims to explain the role of animal health economics in the decision-making processes.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. identify factors contributing to poor health and production in beef cattle and small stock
2. discuss the importance of body condition scoring in evaluating herd and flock performance
3. recommend management strategies for new-born animals, weaners and adults
4. evaluate herd fertility performance based on different parameters
5. evaluate feeding strategies, lick and ration balancing in relation to negative energy balance minimization
6. recommend correct biosecurity measures to ensure optimum health of livestock
7. keep proper herd health records
8. discuss the economic importance and contribution of the livestock sector in the Namibian economy
9. analyze economic problems using basic methods such as partial budgeting, cost-benefit analysis and decision analysis

10. plan, implement, monitor and evaluate animal health and production programs or projects
11. discuss the importance of animal diseases in the efficiency of animal production
12. discuss consumer perceptions of animals and animal products and global trade,
13. Provide details of the critical steps in systems analysis and choose appropriate modelling types and techniques
14. Policy development and implementation processes.

Module Content:

Herd Health Management

The module will cover aspects of herd/flock health, production and reproduction management programmes in beef cattle and small stock. Emphasis on management of replacement rearing, milk production, herd fertility, and nutrition in cattle. Flock health, nutrition and production management of small stock will be discussed. Biosecurity measures and the containment of diseases will be discussed

Animal Health Economics

Importance of animal diseases in efficiency of animal production. Consumers perception of animals and animal products. Global trade. Analyse economic problems using basic methods such as partial budgeting, cost- benefit analysis and decision analysis. Detail the critical steps in systems analysis and choose appropriate modelling types and techniques, eg. Herdmaster. Planning, implementing, monitoring, evaluating animal health & production programmes, Policy development and implementation processes.

Methods of Facilitation of Learning:

Through lectures, case studies, practicals/ field excursions

Assessment Strategies:

Continuous Assessment: Minimum 2 theory assessments and at least 3 marked practical assessments

Examination: 1 x 2hr theory paper

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- regular reviews of module content
- effective supervision and monitoring of assignments, tests and examinations

Course Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	INFECTIOUS DISEASES I
Module Code:	BVM 3711
NQF Level:	7
Notional Hours:	160
Contact Hours:	Lecture: 4 x 1 hr / week Practicals: 1x3 hrs/ alternate week
NQF Credits:	16
Pre-requisites:	BVC 3611 Veterinary Microbiology

Co-requisite: None
Compulsory / Elective: Compulsory
Semester Offered: 1

Module Aim:

This module aims to study infectious diseases caused by pathogenic bacteria and fungi encountered in animals. The laboratory component focuses on the management of a veterinary microbiology lab as well as the isolation and identification of bacteria and fungi of veterinary importance using both conventional and molecular biology techniques.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. distinguish between normal and pathogenic bacteria and fungi isolated from biological or clinical samples
2. identify and associate pathogenic bacteria and fungi with diseases of veterinary importance
3. demonstrate sound knowledge of infectious diseases of bacterial and fungal origin with regards to aetiology of disease, pathogenicity, pathogenesis, clinical signs and host defences
4. explain the transmission and describe the geographical distribution of bacterial and fungal diseases with particular emphasis on notifiable and tropical diseases
5. describe the diagnosis and indicate the treatment, prevention and control of bacterial and fungal infections
6. describe the mastitis syndrome and identify mastitis producing pathogens
7. discuss mycotoxins and associated mycotoxicoses

Module Content:

The module will focus on bacterial and fungal diseases as related to pathogenesis and host defences, isolation and identification of bacteria and fungi of veterinary importance using both conventional and molecular techniques. Furthermore, emphasis will be placed on notifiable and tropical diseases caused by pathogenic bacteria and fungi with regards to aetiology, transmission, clinical signs, vectors (biological and mechanical). The diagnosis and treatment of both bacterial and fungal diseases will be highlighted. Prevention and control methods will also be discussed. The importance of mycotoxins and associated mycotoxicoses will be reviewed.

Module Content:

The module will focus on aetiology, transmission, vectors, clinical signs, pathogenesis of bacterial and fungal diseases and the specific host defences. Diagnosis of specific diseases based on the isolation, biochemical tests, culture and staining of bacteria and fungi. Treatment and control of notifiable and tropical diseases will be highlighted.

Methods of Facilitation of Learning:

Through lectures and practicals

Assessment Strategies:

Continuous Assessment: Minimum 2 theory assessments
Examination: 1 x 3hr theory paper

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.
Equipment to be bought: None
Additional Costs: None

Next scheduled review: 2020

Module Title:	VETERINARY TOXICOLOGY (year course)
Module Code:	BVC 3740
NQF Level:	7
Notional hours:	160
Contact hours:	Lectures: 2 x 1hr lectures /week (year course) Practicals: 1 x 3hr practical / alternate week
NQF Credits:	16
Pre-requisites:	BVB 3532 Veterinary Biochemistry BVM 3631 Veterinary Structure and Function 3 BVM 3632 Veterinary Structure and Function 4
Co-Requisites	BVM 3720 General pathology
Compulsory/Elective:	Compulsory
Semester Offered:	1 & 2

Module Aim:

Toxicology will be covered on a systems basis, starting with toxicology of the body systems. Students will concentrate on toxic plants and chemicals as well as hazardous pesticides and selected poisonous animals including snakes.

Learning outcomes:

Upon completion of this module, students should be able to:

1. identify toxic plants of importance in the cardiovascular, hepatic, gastrointestinal and central nervous system, the skin and adnexa, skeletal system, haemopoietic system and respiratory system
2. describe the effects of selected toxic plants, toxic chemicals and venomous animal species on the cardiovascular, hepatic, gastrointestinal and central nervous system skin and adnexa, skeletal system, haemopoietic system and respiratory system
3. discuss toxic principles and the theory of toxicology including the mechanism of action of these substances in various animal species discuss poisoning with plants and chemicals in the relevant systems
4. Study the control of problem animals with avicides, rodenticides, predicides; and discuss alternative approaches to the use of poisons
5. Discuss various zootoxins including selected venomous snakes and insects.
6. Identify, describe and treat poisoning of animals with common household toxins
7. Explain the Diagnosis and treatment of intoxication
8. Investigate a toxicological case including collection of specimens and treatment of affected animals

Module Content:

Toxicology will cover the study of the nature, effects and detection of various types of poison and poisoning, and the treatment of poisoning. This module will include identification relevant toxic plants of importance in the livestock industry in Namibia, their identification, habitat, and phenology, effects on various species, economic importance, and treatment.

Methods of Facilitation in Learning:

Through lectures, practicals including a toxic plant collection, assignments and field trips

Assessment Strategies:

Continuous Assessment: Minimum 2 theory assessments and at least 2 marked practical assessments

Examination: 1 x practical examination to identify toxic plants and other poisons (40%) and 1 x 3hr theory paper (60%)

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- periodic upgrading of laboratory facilities following new technology developments

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought:

Additional Costs: None

Next scheduled review: 2020

Module Title:	VETERINARY PHARMACOLOGY (year course)
Module Code:	BVM 3700
NQF Level:	7
Notional hours:	160
Contact hours:	Lectures: 2x 1hr lectures /week
NQF Credits:	16
Pre-requisites:	BVM 3631 Veterinary Structure and Function 3 BVM 3632 Veterinary Structure and Function 4 BVM 3651 Veterinary Parasitology I BVM 3652 Veterinary Parasitology II
Compulsory/Elective:	Compulsory
Semester Offered:	1 and 2

Module Aim:

This module is aimed at exposing the students to the principles of fundamental pharmacology (pharmacotherapeutics, pharmacokinetics, pharmacodynamics), ethics and drug legislation and functional pharmacology (drugs affecting the central and peripheral nervous system). The module also covers the appropriate selection of chemotherapeutic agents, as well as the drugs affecting the different organ systems

Learning outcomes:

Upon completion of this module, students should be able to:

1. Use pharmacological terms and abbreviations correctly
2. perform pharmacological conversions and calculations
3. explain the methods of drug administration using appropriate routes in different animal species
4. discuss the legislation governing storage, dispensing and disposal of veterinary drugs, as well as biosafety and biosecurity considerations

5. discuss the processes of absorption, distribution, metabolism and excretion of drugs after administration, in different animal species and the factors affecting this
6. discuss different mechanisms of drug action and the effect of drugs on the body
7. discuss the various factors to be considered when deciding on a therapeutic plan for a patient
8. summarise the classification, mechanism of action, pharmacological effects, indications for use, side and adverse effects and scheduling of the drugs affecting the central nervous system Summarise the classification, mechanism of action, pharmacological effects, indications for use, side and adverse effects and scheduling of drugs affecting the various organ systems in the body
9. Discuss the rational use of antimicrobial agents
10. Discuss the various classes of antimicrobial agents
11. discuss withdrawal intervals of drugs
12. distinguish ecto- and endoparasitic remedies ingredients
13. apply the guidelines for the prescription of veterinary drugs
14. explain how to combine some drugs safely
15. discuss the prevention of drug residues in animals

Module Contents:

The Pharmacology section will cover basic pharmacotherapeutic principles, pharmacodynamics, and pharmacokinetics. The classification of drugs and legal requirements for storing, dispensing, prescribing and disposing of veterinary drugs as well as biosafety and biosecurity considerations. The following topics will be addressed: functional pharmacology, chemotherapeutics, and systemic drugs acting on the various organ systems.

Methods of Facilitation in Learning

Through lectures, practicals and field trips

Assessment Strategies

Continuous Assessment: Minimum 3 theory assessments

Examination: 1 x 3hr theory paper at the end of the second semester

Quality Assurance Arrangements

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- periodic upgrading of laboratory facilities following new technology developments

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought:

Additional Costs: None

Next scheduled review: 2020

Module Title:	FISH AND BEE MEDICINE
Module Code:	BVC 3701
NQF Level:	7
Notional Hours:	80
Contact Hours:	Lectures: 2 x 1hr lectures per week Practicals: 1x3 hrs/ alternate week
NQF Credits:	8
Pre-requisites:	None
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Aims:

This module aims to introduce students to applied knowledge of fish anatomy, fish and bee husbandry and health, focusing on diseases of economic importance.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. discuss the causes, diagnosis, pathology, pathogenesis, control, and management of infectious and non-infectious diseases of fish relevant to Namibia and International trade, as well as applied anatomy
2. Understand the principles of health and production problems of fish and bees
3. describe good management practices in fish conservation and medicine
4. discuss the environmental conservation of bees
5. undertake field studies of aquatic and bee sectors
6. handle fish and bees safely and properly
7. safely collect honey bee products

Module Content:

Fish medicine: This module will acquaint students with an overview of fish anatomy followed by fish husbandry as well as the aetiology, diagnosis, pathology, pathogenesis, chemotherapy, control, and management of infectious and non-infectious diseases of fish, especially pertaining to cultured food and tropical fish.

Bee medicine: This module will acquaint students with knowledge of honey bee husbandry as well as the aetiology, diagnosis, pathology, pathogenesis, control, and management of infectious and non-infectious diseases of bees.

Methods of Facilitation of Learning:

Through lectures and practicals / field trips

Assessment Strategies:

Continuous Assessment: Minimum 2 theory assessments/assignments, and at least 1 marked practical assessment

There will be no examination in this module

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- Regular reviews of module content
- Effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	GENERAL PATHOLOGY (year course)
Module Code:	BVM 3720
NQF Level:	7
Notional Hours:	160
Contact Hours:	Lecture: 2 x 1hr / week Practicals: 1 x 3 hr practical every other week
NQF Credits:	16
Pre-requisites:	BVM 3602 Veterinary Immunology and Vaccinology BVM 3631 Veterinary Structure and Function 3 BVM 3632 Veterinary Structure and Function 4 BVM 3651 Veterinary Parasitology I BVM 3652 Veterinary Parasitology II
Co-requisites:	none
Compulsory / Elective:	Compulsory
Semester Offered:	1&2

Module Aims:

The module covers general principles of pathology across a range of species.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. discuss the mechanisms that underlie the development of lesions
2. Recognize and differentiate the major types of lesions at gross and microscopic levels
3. Examine and describe gross lesions using appropriate pathologic terminology
4. Perform a basic post mortem examination of a selected species
5. Distinguish between organic and acquired conditions

Module Content:

This module will cover common post mortem changes, disease detection/diagnosis after somatic death, cell responses to different grades of stimuli/injuries (cellular adaptation), cellular/tissue lesions and death, lesions due to disturbance of growth and cell differentiation, degenerative lesions and necrosis, lesions due to circulatory disturbances, hypersensitivity and aberrant immunological reactions. Practical training will expose the student to techniques used in a post mortem examination. In addition will students will be required to attend necropsies.

Methods of Facilitation of Learning:

Through lectures, practicals

Assessment Strategies:

Continuous Assessment: Minimum 2 theory and 3 practical assessments per semester

Examination: 1 x 2hr practical examination (40%) and 1 x 3hr theory paper (60%)

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- Regular reviews of module content
- Effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title	VETERINARY ANAESTHESIOLOGY
Module Code:	BVM 3732
NQF Level:	7
Notional Hours:	80
Contact Hours:	2 x 1hr lecture / week Practicals: 1 x 3hr practical every 2 nd week
NQF Credits:	8
Pre-requisites:	BVM 3631 Veterinary Structure and Function 3 BVM 3632 Veterinary Structure and Function 4
Co-requisites:	BVM 3701 General Surgery BVM 3731 Diagnostic Imaging
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Aims:

The module aims to introduce students to veterinary anaesthesiology, including the anaesthetist's role for the safe perioperative anaesthetic management of patients using injectable and inhalation anaesthetics.

Learning Outcomes:

Upon completion of this module, students should be able to:

REVIEW

1. Physiology of the cardiorespiratory-, autonomic nervous systems and pain.
2. Mechanism of action, pharmacokinetics and pharmacodynamics of the commonly used anesthetic agents and local anesthetics
3. Anatomy of the peripheral nerves suitable for local anaesthetic nerve blocks.

.Introduction and general principles.

1. Define anaesthesia and describe its characteristics.
2. Define balanced anaesthesia, analgesia, local anaesthesia, local analgesia, hypnosis, narcosis, tranquilisation and sedation.
3. Describe preoperative fasting practices for adult monogastric animals, ruminants and horse.
4. Describe the American Association of Anaesthetists classification of anaesthetic risk.
5. Describe requirements for recovery from anaesthesia.
6. Describe the responsibilities of an anaesthetist.

Preoperative medication.

1. Name the drug classes used for premedication in domestic animals and list the drugs commonly used.
2. Describe the pharmacology of the following premedication drugs: acepromazine, azaperone, diazepam, midazolam, xylazine, (dex)medetomidine, detomidine, romifidine, atropine and glycopyrrolate.
3. Describe possible adverse effects associated with premedication and precautions to be exercised in their clinical use.
4. Calculate the dose (volume in ml) of a drug to be administered to a patient with dosage given in mg/kg or µg/kg and drug concentration as % solution or mg/ml.

Intravenous induction of anaesthesia.

1. Name the drug classes used for intravenous induction of anaesthesia and list the drugs commonly used in clinical anaesthesia of domestic animals.
2. Describe the pharmacology of the following IV anaesthetics: thiopentone, propofol, alfaxalone, ketamine and fentanyl.
3. Explain the pharmacological mechanisms responsible for recovery from anaesthesia after a single IV bolus and following repeated administration.
4. Describe adverse effects associated with IV anaesthetics and precautions to be exercised in their clinical use.

Inhalation anaesthesia.

1. Describe the pharmacology of isoflurane and sevoflurane.
2. Describe the uptake, redistribution and excretion of inhalation anaesthetics.
3. Define the following concepts and explain how it influences clinical anaesthesia: minimum alveolar concentration (MAC), lipid solubility, blood/gas solubility and vapor pressure when comparing the different inhalation drugs.
4. Describe the cardiopulmonary effects of the inhalation anaesthetics.
5. Describe possible adverse effects associated with inhalation anaesthetics.

Intravenous- and inhalation induction of anaesthesia.

1. List peripheral veins suitable for IV induction of anaesthesia.
2. Name three alternative routes for induction of anaesthesia.
3. Describe a techniques for intravenous induction with propofol, thiopentone, ketamine, and alfaxalone.
4. Describe the use of an induction box and face mask for inhalation induction of anaesthesia.

Classification of inhalation anaesthetic systems.

1. Describe the classification of inhalation anaesthetic systems
2. Name the components of the inhalation anesthesia machine and describe the function of the components.
3. Describe the clinical use of non-rebreathing system.
4. Contrast the advantages and disadvantages of non-rebreathing and rebreathing circuits.
5. Name and describe breathing circuits suitable for animals <5 kg and ≥5kg.
6. Calculate fresh gas flow rates for non-rebreathing and rebreathing circuits.

Tracheal intubation in domestic species.

1. Describe the design of an tracheal tube
2. Describe intubation techniques and equipment used for intubation.
3. Describe complications associated with intubation.

Monitoring during anaesthesia.

1. Describe techniques used for monitoring anaesthetic depth, cardiorespiratory-, musculoskeletal- and gastro-intestinal systems.
2. Name the stages and planes of general anaesthesia and describe the signs associated with it.
3. Describe techniques and name equipment used in monitoring the anaesthetised animal.
4. Name factors that may adversely influence pulseoximeter values.

Local anaesthesia

1. Describe techniques commonly used during surgery and perioperative pain management in domestic animals.
2. Name local anaesthetic drugs and adjuncts suitable for perioperative pain management.
3. Describe the landmarks for the following nerve blocks in the dog: infraorbital, maxillary, mandibular, mental, retrobulbar, brachial plexus, RUMM, ischiatic, femoral and epidural.
4. Describe the landmarks for the following nerve blocks in the horse: infraorbital, maxillary, mandibular, mental, periorbital, distal limb nerve blocks and caudal epidural.
5. Describe the landmarks for the following nerve blocks in ruminants: corneal, auriculopalpebral, paravertebral, inverted L, caudal epidural, distal limb blocks including IV regional block.

Principles of pain management.

1. Define pain and explain the following concepts: noxious stimulus, innocuous stimulus, nociception, physiological & pathological pain, primary- & secondary hyperalgesia, allodynia.
2. Describe the pathophysiology of peripheral- and central hypersensitisation including spinal modulation.
3. Describe peripheral nociceptors and spinal nerve pathway resulting in pain perception.
4. List neurotransmitters and neuromodulators involved in pain transmission.
5. Describe the signs associated with pain in domestic animals.
6. Name drug classes and describe their mechanism of action suitable for pain management.
7. Design an appropriate analgesic protocol for common surgical procedures performed in domestic species, e.g. male castration, ovariohysterectomy, celiotomy, dental surgery and limb fractures.

Diagnosis and management of common anaesthetic complications.

1. Describe the perioperative management of the following: hypotension, bradycardia, tachycardia, hypoventilation and hypothermia.
2. Describe the intraoperative management of hypoventilation, apnoea.
3. Describe the guidelines for applying manual positive pressure ventilation.
4. Describe the management of tympany and regurgitation in ruminants and monogastric animals.

Anaesthetic protocols for small animals.

1. Formulate an anaesthetic protocol for common surgical procedures performed under local or general anaesthesia in small animals.
2. Describe a technique to induce anaesthesia suitable for tracheal intubation with propofol, thiopentone or alfaxalone.
3. Formulate an anaesthetic protocol suitable for short term IV maintenance of anaesthesia (30min.).
4. Describe a technique to induce anaesthesia with IM ketamine.
5. Describe a technique to induce anaesthesia IV with either ketamine or fentanyl in cardiovascular compromised animals.
6. Formulate an anaesthetic protocol for castration, ovariohysterectomy, caesarian section, diaphragmatic rupture, gastric-dilatation-volvulus, and pyometra.
7. Describe principals to be applied in the anaesthetic management of neonatal and geriatric animals.

Anaesthetic protocols for large animals

In the horse formulate an anaesthetic protocol for:

1. Short term IV induction and maintenance of anaesthesia, e.g. castration.
2. Standing chemical immobilisation, e.g. castration.
3. Name drugs suitable for induction of anaesthesia in a foal.

In cattle and calf describe a protocol suitable for short term IV induction and maintenance of anaesthesia.

In the pig, calf, sheep, and goat name drugs suitable for short term IV induction and maintenance of anaesthesia.

Module Content:

This introductory module in veterinary anaesthesiology will focus on the anaesthetist's role for the safe anaesthetic management of patients using injectable and inhalation anaesthetics. This requires an understanding of patient evaluation, selection and knowledge of premedication, induction and maintenance anaesthetic drugs as well as anaesthetic equipment, monitoring depth of anaesthesia and physiologic function. Species specific differences with regards to drug and equipment choices/requirements will be discussed.

Methods of Facilitation of Learning:

Through lectures, case studies and practicals,

Assessment Strategies:

Continuous Assessment: Minimum of 2 theoretical assessments and 1 marked assignment (33% each for CA)

Examination: 1 x 2 hour theory paper

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- regular reviews of module content
- effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	HERD HEALTH MANAGEMENT AND ECONOMICS II
Module Code:	BVM 3722
NQF Level:	7
Notional Hour:	80
Contact Hours:	Lecture: 2 x 1 hr / week Practicals: 1x3 hrs/ alternate week
NQF Credits:	8
Pre-requisites:	BVM 3651 Veterinary Parasitology I BVM 3622 Animal Production BVM 3602 Veterinary Immunology and Vaccinology
Co-requisite:	None

Compulsory / Elective: Compulsory
Semester Offered: 1

Module Aims:

The module introduces principles of herd health and reproduction management in order to optimize production and health in dairy cattle. Biosecurity measures will also be addressed. The module also aims to explain the role of animal health economics in the decision-making processes.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. discuss factors and recommend management strategies for controlling mastitis in herds
2. discuss the objectives of dry period management in the production cycle of cows
3. determine metabolic diseases based on rumen activity
4. evaluate herd fertility performance based on different parameters
5. evaluate feeding strategies and ration balancing in relation to negative energy balance minimization in dairy cattle
6. recommend correct biosecurity measures to ensure optimum health of livestock
7. Maintain proper herd health records
8. evaluate gynaecological herd health records
9. Discuss the advantages and disadvantages of different dairy parlor types and the operation of milking machines
10. Recommend correct biosecurity measures to ensure optimum health of livestock
11. Recommend methods of hoof management
12. Identify factors contributing to poor health and production, dairy cattle
13. Importance of body condition scoring in evaluating herd & flock performance
14. Recommend management strategies for new born animals , weaners and adults
15. Explain the economic importance and contribution of the dairy livestock sector in the Namibian economy
16. Analyse economic problems using basic methods such as partial budgeting, cost-benefit analysis and decision analysis

Module Content:

Herd Health Management:

The module will cover aspects of herd health, production and reproduction management programs in dairy cattle. Emphasis will be given to management of cows in the dry period, milk production, herd fertility, udder health, lactation, nutrition and body condition scoring in dairy cattle. Management strategies for new born animals, weaners and adults. Management of metabolic disease conditions, hoof problems and mastitis will be emphasized. Biosecurity measures and the containment of diseases will be discussed. Record keeping and gynaecological herd health will be emphasized. Different parlour types and milking machines will be covered.

Animal Health Economics:

Economical aspects of the dairy herd and productivity schemes will be analysed and the economic importance and contribution of the dairy sector in the Namibian economy will be covered,

Methods of Facilitation of Learning:

Through lectures, case studies, practicals/ field excursions

Assessment Strategies:

Continuous Assessment: Minimum 2 theory assessments and at least 3 marked practical assessments

Examination: 1 x 2hr theory paper

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- Regular reviews of module content
- Effective supervision and monitoring of assignments, tests and examinations

Course Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	INFECTIOUS DISEASES II
Module Code:	BVM 3712
NQF Level:	7
Notional Hours:	160
Contact Hours:	Lectures: 4 x 1hr lectures /week Practicals: 1 x 3hr practical / alternate week
NQF Credits:	16
Pre-requisites:	BVC 3611 Veterinary Microbiology
Co-requisite:	BVM 3711 Infectious diseases I
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Aim:

To teach students about viral and prion diseases which have a significant economic impact and how to identify and control them. Specific emphasis will be placed on those found in Namibia.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. describe the geographical distribution, aetiology transmission, strategy of replication, pathogenicity and pathogenesis involved in viral diseases of veterinary importance
2. describe viral diseases of veterinary importance as related to clinical signs, diagnosis, prevention and control
3. discuss vaccination schemes against viral diseases with emphasis to those applied in Namibia
4. review prions and prions disease of veterinary importance

Module Content:

The module will cover virus families of veterinary importance and the associated diseases in different animal species. The aetiology, pathogenicity, pathogenesis, clinical signs, diagnosis, prevention and control will be discussed. Prions and prion diseases will also be highlighted.

Methods of Facilitation of Learning:

Through lectures, practicals, written assignments, class discussions.

Assessment Strategies:

Continuous Assessment: Minimum 2 theory assessments

Examination: 1 x 3hr theory paper

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	ETHNO-VETERINARY MEDICINE
Module Code:	BVM 3702
NQF Level:	7
Notional Hours:	40
Contact Hours:	Lectures: 1hr lecture/ week Practicals/Tutorials: 4 practical sessions including tutorials
NQF Credits:	4
Pre-requisites:	None
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Aims:

To teach students to appreciate and understand the importance and use of natural resources in veterinary medicine and the practice of ethno-veterinary medicine in relation to the different farming systems in developing countries, particularly Namibia.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. discuss the importance of knowing ethno-veterinary practices for a veterinarian
2. discuss the use of traditional medicine in different communities based on the locally available indigenous natural resources
3. list the various and diverse natural resources found in Namibia which are used in the development and preparation of the different traditional remedies for the care of animal health and treatment of animal diseases
4. discuss the use of ethno-veterinary medicine and traditional remedies within the different farming systems

Module Content:

This module covers traditional animal health care which encompasses the knowledge, skills, methods, practices, and beliefs about animal health care found among members of a particular community. This module is specifically intended to expose the students to the practices of the indigenous disease-prevention and treatment methods carried out by farmers, traditional healers particularly in communal areas in Namibia. Available information will be provided on treatment of animal diseases according to whether they conform to standard veterinary practice or close equivalents, or could be supported by scientific knowledge, or judged by traditional healers to be effective.

The following topics will be covered: Indigenous Knowledge Systems (IKS) as related to the use and application of herbal and traditional medicines, identification, collection and preparation of medicinal plants. The practical part of this module will focus on the collection and identification and classification of herbal/medicinal plants, identification and profiling of medicinal plant extracts.

This module will also cover ethno-veterinary practices-contemporary relevance and conservation of bioresources, ethno-botany and pharmacognosy, Traditional Medicine Systems (TMS) and the practice of ethno-veterinary medicine as related to the different farming systems in developing countries and particularly in the communal areas in Namibia.

Documentation of Local Health Traditions (LHTs). Pharmacological basis of ethno-veterinary medicine, PRA and Assessment of Local health traditions, functional herbal remedies for primary health care of livestock, Use of plant products in animal production and health as applied in Namibia.

Methods of Facilitation of Learning:

Through lectures, tutorials and field trips. Practical sessions will be shared with Toxicology where appropriate.

Assessment Strategies:

Continuous Assessment: minimum 2 theory assessments and at least 3 marked practical assessments/tutorials. No examination will be written for this module.

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- student evaluation of the module and lecturers at the end of the semester
- regular reviews of module content
- effective supervision and monitoring of assignments and tests.

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	VETERINARY CLINICAL DIAGNOSTICS
Module Code:	BVC 3722
NQF Level:	7
Notional Hours:	80
Contact Hours:	Lectures: 2 x 1hr lectures per week Practicals: 1 x 3hrs / alternate week
NQF Credits:	8
Pre-requisites:	BVM 3631 Veterinary Structure and Function 3 BVM 3632 Veterinary Structure and Function 4
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Aims:

The module will be mostly taught in a practical context. Routine diagnostic and therapeutic procedures are demonstrated and practiced for the major domestic animal species. This module will also cover principles of clinical pathology and associated sampling procedures.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. perform a thorough clinical examination on canines, felines, ruminants, and equines using the POMR (problem oriented medical record) approach
2. use specific medical terminology in veterinary medicine
3. describe selected clinical diagnostic sampling procedures
4. explain basic principles of clinical diagnostics including blood chemistry and hematology
5. observe or perform basic diagnostic tests (eg blood smear) and auxillary tests (eg diagnostic imaging)
6. differentiate between routes of medicine administration, both parenteral and non-parenteral
7. perform communication and interaction with clients in role play simulations
8. identify normal structures on radiographs of small animals and horses

Module Content:

Common diagnostic procedures used in key domestic animals, including a thorough, systematic, species specific clinical examination including principles of clinical pathology. Problem oriented medical record keeping as well as communication to clients will be explained and practiced.

Methods of Facilitation of Learning:

Through lectures and practicals

Assessment Strategies:

Continuous Assessment: Minimum 2 theory assessments and at least 3 marked practical assessments

Examination: 1 x 2 hr practical examination (50%) and 1 x 2hr theory paper (50%)

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- Regular reviews of module content
- Effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	FIELD PRACTICAL TRAINING: PRIVATE/STATE VETERINARY CLINIC
Course Code:	BVM 3709
NQF Level:	7
Contact hours:	10 days(5 each in Private Veterinary Clinics and State Veterinary Clinics)
NQF Credits:	7
Pre-requisites:	None

Compulsory/Elective: Compulsory
Semester Offered: 1 or 2

Module Aim:

The aim of this module is to expose students to practical knowledge of veterinary practice at Private and State Veterinary Clinics under the supervision of a Veterinarian and other technical experts in the field to be acquainted with the practicalities of a working environment.

Learning outcomes:

Upon successful completion of this module, the student should be able to:

1. relate to the working environment in Private or State Veterinary Clinics
2. monitor and follow up clinical cases
3. keep accurate records

Module Contents:

This module is designed to further expose students to the realities of working in either a private or state veterinary clinic. They are expected to observe and participate in different facets of clinical examinations, disease diagnosis, veterinary surgery and diagnostic imaging, provision of extension services and assist with management functions.

Methods of Facilitation in Learning:

On-the-job training and mentorship approach, apply knowledge and concepts through problem solving, 100% attendance and compulsory participation in daily activities

Assessment Strategies:

Continuous Assessment: 100%

Quality Assurance Arrangements

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field

Requirements:

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	CLINICAL PATHOLOGY
Module Code:	BVM 3821
NQF Level:	8
Notional Hours:	80
Contact Hours:	5 hours of integrated learning and instruction (Lectures and Practicals) per week
NQF Credits:	8
Pre-requisites:	none
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Aims: This module will cover all aspects of laboratory based diagnosis of veterinary diseases, including sampling, analysis and interpretation of blood and other body fluids, cytology of tissues and tumours. Different

staining techniques, and the use of automated diagnostic equipment will be covered. Urinalysis and diagnostic techniques for selected parasites and other pathological conditions will be covered.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. take samples of body fluids from live animals (and during post mortem examinations)
2. perform fine needle aspirates and take impression smears on organs, tissues and neoplasms
3. prepare samples in the laboratory for analysis, and discuss the preparation of samples for submission to a laboratory
4. apply different staining techniques to various specimens, including blood smears, cytology specimens and urine sediment
5. perform a complete urinalysis including organoleptic test, the determination of specific gravity, chemical analysis and microscopic evaluation of the sediment and discuss the results
6. perform a complete blood count and a coagulation test using available laboratory equipment and interpret the results
7. perform a chemical analysis of serum or plasma, using available laboratory equipment, to determine levels of blood enzymes, proteins and other relevant analytes and discuss the results
8. (discuss interpretation of laboratory results)

Module Content:

This module will cover laboratory testing of animal species in the fields of haematology, clinical biochemistry, diagnostic cytology, immunology and urinalysis.

Theoretical and practical training with emphasis on the skills required to take samples of blood and other body fluids from live animals (or during post mortem examinations), and to analyse these samples using appropriate laboratory methods. In addition, different techniques of performing biopsies of healthy and diseased tissue and masses will be taught

Specific techniques will include complete blood count, (coagulation testing), biochemistry of blood enzymes, as well as designing and performing pre-screening panel tests such as a pre-surgical panel, geriatric panel, neonatal panel (will be covered). using available laboratory equipment.

General guidelines for setting up and maintenance of blood banks and colostrum banks for dogs and cats will also be provided.

Methods of Facilitation of Learning:

Through lectures, practicals and class discussions.

Assessment Strategies:

Continuous Assessment: Minimum 2 theory assessments and one practical test.

Examination: 1 x 2 h integrated paper

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- regular reviews of module content
- effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	SYSTEMIC PATHOLOGY (year course)
Module Code:	BVM 3800
NQF Level:	8
Notional Hours:	160
Contact Hours:	Lecture: 1 x 2hr / week Practicals: 1 x 3 hr practical every other week
NQF Credits:	16
Pre-requisites:	BVM 3720 General Pathology
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1 & 2

Module Aims:

To expose students to systemic pathologic diagnosis of animal diseases by a systematic and species-specific approach based on common developmental, traumatic, degenerative, vascular, toxic, infectious, neoplastic and miscellaneous conditions, identify and describe common gross and microscopic lesions, and formulate a morphologic diagnosis or list of differential diagnoses. The focus in this module is the cardiovascular, reproductive, digestive, urinary and musculoskeletal systems.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. explain the pathogenesis of systemic diseases in selected animal species
2. correctly perform animal necropsy
3. prepare specimens for laboratory diagnosis including histopathology
4. write an accurate pathology report
5. interpret results from diagnostic tests
6. relate specific pathological lesions to the relevant disease

Module Content:

This module will emphasize diseases affecting body systems, specifically the cardiovascular, reproductive, digestive, urinary, musculoskeletal, cutaneous, respiratory, endocrine, haemopoietic, hepatobiliary and neurological systems with regards to the following: major and common malformations affecting the system and their characteristic features, degenerative lesions and their gross and microscopic pictures, inflammatory lesions and their gross and microscopic pictures, tissue lesions due to diseases affecting the system, special lesions peculiar to the systems, parasites found in the system and their effects, neoplasms especially primary neoplasms affecting the system.

Methods of Facilitation of Learning:

Through lectures, practicals and class discussions

Assessment Strategies:

Continuous Assessment: Minimum 2 theory assessments and at least 3 marked practical assessments per semester

Examination: 1 x 2hr practical examination (40%) and 1 x 3hr theory paper (60%).

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- regular reviews of module content
- effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	WILDLIFE CLINICAL STUDIES I
Module Code:	BVC 3801
NQF Level:	8
Notional Hours:	80
Contact hours:	3 or 5 (alternately) hours of integrated learning and instruction per week
NQF Credits:	8
Pre-requisites:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Aims:

This Module Aims: This module aims to provide a foundation of veterinary science as it relates to wildlife conservation and the game industry. Areas covered will include underlying biological principles, wildlife infectious diseases and their control, wildlife pathology, disease surveillance and trade in game, together with a detailed look into wildlife interventions required by both conservation and the game industry. Mindful of the One Health perspective, and concentrating at the interface between wild animals, domestic animals and man, the primary goal is to provide the Namibian veterinarian of tomorrow with the managerial skills to monitor and maintain a healthy population of wildlife in Namibia and to deal with the challenges of wildlife conservation and an ever-growing game industry.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. Describe the major principles underpinning wild animal conservation
2. Compare and contrast the differing philosophies and management practices between wildlife conservation and the game industry
3. Describe basic wild animal behaviour and the principles and practice of veld management with respect to wildlife.
4. Describe the principles underlying the ecology of wildlife disease, including ecological, epidemiological and disease emergence concepts in disease ecology

5. Describe the wildlife/livestock/human interface and explain its significance
6. Explain the potential negative impact of infection and disease on wildlife populations
7. Describe the epidemiology of some important (in particular Transboundary) diseases of selected wildlife and how they relate to domestic animals and man
8. Describe the major mechanisms for preventing and controlling the transmission of disease within wildlife species, and between wildlife, domestic animals and man
9. Diagnose some of the important viral, bacterial, protozoal and parasitic diseases of wildlife
10. Describe how to carry out surveillance of wildlife populations highlighting some of the limitations of currently available tests
11. Speculate on some of the major emerging and re-emerging infectious diseases involving wildlife and their potential impact
12. Reflect on the possible positive and negative impacts of legal and illegal trade in wildlife
13. List the common practices used in wildlife monitoring and demonstrate at least one of them,
14. List and interpret the Namibian legislation with respect to the wildlife veterinarian, the wildlife industry and wildlife trade both within Namibia and for export
15. Use the One Health concept to explain how to improve health and well-being through the prevention of risks and the mitigation of effects of crises that originate at the interface between humans, animals and their various environments.
16. Identify zootoxic species of relevance to veterinary medicine and treatment of affected animals

Module Content:

This module will provide an overview to wildlife veterinary science as it relates to both conservation and the wildlife industry. It will cover the major infectious conditions of wildlife and the transmission of these infections both within wildlife and to domestic animals and man. The module will examine control measures for transmissible wildlife infections from a One Health perspective including the effect of habitat loss and limited nutrition, fencing, movement control, vaccination and Commodity Based Trade (as it relates to wildlife). Wildlife trade, both legal and illegal, will be examined and its potential veterinary impact on wildlife, domestic animals and humans will be examined.

The principles underlying the ecology of wildlife disease, including ecological, epidemiological and disease emergence concepts in disease ecology will be examined. Conservation medicine will be briefly described. A basic understanding of the biological principles underpinning wild animal conservation and management, will be presented together with an awareness of current problems in wildlife disease with implications for wildlife conservation and welfare. Emerging infectious diseases as a serious hazard both for wild animal species and for the domestic animal and human populations will be discussed. Wildlife nutrition, veldt management and basic wild animal behaviour will be covered, while the principles of game ranch management, tourism, hunting, live sales and game meat production will be examined.

The relevance of disease control and treatment in game ranching will be compared to that in the free-ranging situation, where risks need to be quantified while control and treatment may not be appropriate or practical. The role of disease in the ecosystem and its effects on population dynamics will be presented, together with the impact of certain veterinary actions may have on biodiversity and the ecology interface. Basic wildlife pathology, similarities and differences to domestic animal pathology will be presented. The similarities and differences between a wild animal and a domestic animal post mortem will be presented including sample collection, preservation and processing; and the use of forensics in the wild animal arena will be explored. Additionally the module will cover how to undertake statistically-meaningful epidemiological surveys within wildlife including specimen sampling for infectious disease screening.

Methods of Facilitation of Learning:

Through lectures, practicals and class discussions

Assessment Strategies:

Continuous Assessment: Minimum 2 theory assessments and at least 2 marked practical assessments

Examination: 1 x 2hr theory paper (75%) and 1 x 1 hr practical exam (25 %)

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- regular reviews of module content
- effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	VETERINARY PUBLIC HEALTH I
Module Code:	BVM 3811
NQF Level:	8
Notional Hours:	160
Contact Hours:	Lecture: 4 x 1 hr / week Practicals: 1x3 hrs/ alternate week
NQF Credits:	16
Pre-requisites:	BVM 3651 Veterinary Parasitology I BVM 3652 Veterinary Parasitology II BVM 3711 Infectious Diseases and Microbiology I BVM 3712 Infectious Diseases and Microbiology II BVM 3720 General Pathology
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Aims:

This module aims to provide students with an overview of the role of the veterinary profession with respect to public health in terms of the One Health concept.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. discuss the role of the veterinary professional in public health
2. explain the effect of food-borne diseases on public health in terms of the One Health concept
3. outline the various stages of the food chain that lead 'from farm to fork' and identify critical stages at which risks to public health may occur
4. describe the key features of dairy management emphasizing potential sources of contamination in milk production
5. explain the principles of HACCP with regards to food safety
6. explain the control of the most important zoonotic, waterborne and food borne diseases

Module Content:

This module will provide students with an overview of the role of the veterinary professional with respect to the protection of the health of the public. Principles of Hazard Analysis and Critical Control Points (HACCP) and methods used to evaluate the risk of disease transmission, basic principles of food safety control (red meat, poultry meat, milk and eggs). The module will provide students with a comparative overview of the most important zoonotic, waterborne and food borne diseases.

Methods of Facilitation of Learning:

Through lectures, class discussions and practicals

Assessment Strategies:

Continuous Assessment: Minimum 2 theory assessments and at least 3 marked practical assessments

Examination: 1 x 3hr theory paper

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- regular reviews of module content
- effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	PRODUCTION ANIMAL CLINICAL STUDIES I
Module Code:	BVC 3831
NQF Level:	8
Notional Hours:	160
Contact Hours:	7 hours /week of integrated learning and instruction (Lectures and Practical)
NQF Credits:	16
Pre-requisites:	BVM 3701 General Surgery BVM 3731 Diagnostic Imaging BVM 3732 Anaesthesiology BVM 3711 Infectious Diseases I BVM 3712 Infectious Diseases II BVM 3740 Veterinary Toxicology
Co-requisite:	BVC 3832
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Aims:

This module focusses on ways to improve the health status and production effectiveness of pig herds and poultry flocks from a holistic and cost-effective viewpoint by integrating and applying relevant veterinary knowledge with a view to identifying and solving health and production problems.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. discuss the important aspects of poultry and pig production
2. Identify and describe the aetiology and pathogenesis of some of important diseases of pigs and poultry
3. diagnose and treat some of important diseases of pigs and poultry
4. discuss nutritional and housing strategies to ensure maximum productivity of pigs and chickens
5. recommend correct biosecurity measures applicable to piggeries and poultry houses
6. integrate concepts of anatomy, physiology, disease manifestation as it applies to poultry and porcine treatment
7. Perform basic practical procedures in poultry and pigs

Module Content:

The module will cover health, production, disease diagnosis and treatment of pigs and poultry.

Pigs: nutrition and related disorders as well as diagnosis and treatment of important parasitic and infectious diseases and other miscellaneous conditions in pigs. Applied surgical techniques will be covered. A problem solving approach on a herd basis strives to improve the health status and production effectiveness of piggeries from a holistic and cost-effective viewpoint.

Poultry: Poultry flock health and management programmes, including vaccination programs, aspects of housing and production systems, nutrition and nutritional diseases will be studied. Diagnosis and treatment of parasitic and infectious diseases of importance in the industry will be covered. Avian anatomy will also be studied in this module.

Methods of Facilitation of Learning:

Through lectures, practicals and class discussions

Assessment Strategies:

Continuous Assessment: Minimum 2 theory assessments and at least 3 marked practical assessments
The final examination consist of 1 x 3hr integrated theory paper, as well as a 15 min oral examination.
The theory paper will contribute 80% towards the examination mark and the oral will contribute 20%.
A sub-minimum of 35% applies to each of the two sections of the examination.

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- regular reviews of module content
- effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title: COMPANION ANIMAL CLINICAL STUDIES I

Module Code:	BVC 3800
NQF Level:	8
Notional Hours:	160
Contact Hours:	7 hours / week of integrated learning and instruction (Lectures and Practicals)
NQF Credits:	32
Pre-requisites:	BVM 3602 Veterinary Immunology and Vaccinology BVM 3652 Veterinary Parasitology II BVM 3700 Veterinary Pharmacology BVM 3740 Veterinary Toxicology BVM 3701 General Surgery BVM 3731 Diagnostic Imaging BVM 3732 Anaesthesiology
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1 and 2

Module Aims:

The module aims to provide students with a holistic approach to the diagnosis and treatment of dogs and cats, through an integration of multidisciplinary veterinary procedures. The focus this year will be on the **haemolymphatic, nephrology/urology, gastroenterology and hepatic/pancreatic systems, the endocrine and cardio-respiratory systems, as well as dermatology.**

Learning Outcomes:

Upon completion of this module, students should be able to:

1. discuss the aetiology, pathogenesis of important diseases of dogs and cats.
2. discuss the diagnosis and treatment of relevant diseases of dogs and cats
3. discuss diagnostic imaging procedures relevant to the selected organ system
4. discuss relevant diagnostic images and blood smears of dogs and cats
5. describe selected surgical techniques used in dogs and cats relevant to selected organ systems
6. discuss the administration of selected veterinary drugs for treatment of the relevant conditions in dogs and cats
7. discuss the relevant management and care for dog and cat patients

Module Content:

This is a multi-disciplinary module where applied clinical pathology, diagnostic imaging, medicine and surgery are integrated to equip the student with a holistic approach to the diagnosis and treatment of small animal patients

Course material will provide students with an understanding of the pathophysiology, diagnosis, clinical management and best treatment options of disease processes affecting various organ systems.

Methods of Facilitation of Learning:

Through lectures, class discussions and practicals. Achieving clinical skills as prescribed by the Skills Logbook will determine the format as well as the number of practicals. Lectures and assessments are either delivered face-to-face or online on the University of Namibia online teaching platform Moodle. Assessments and training of clinical skills will be done face-to-face.

Assessment Strategies:

Continuous Assessment: Minimum 2 theory assessments and 1 practical test in each semester, a total of 4 theory assessments and 2 practical tests per year

The final examination consist of 1 x 3hr integrated theory paper, as well as a 15 min oral examination.

The theory paper will contribute 80% towards the examination mark and the oral will contribute 20%.

A sub-minimum of 35% applies to each of the two sections of the examination. The continuous assessment will contribute 40% towards the final pass mark and the final examination, 60%.

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- regular reviews of module content
- effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	Theriogenology I
Module Code:	BVB 3800
NQF Level:	8
Notional Hours:	160
Contact Hours:	3½ hours per week of integrated learning and instruction (2 hours lectures per week and 3 hours practicals every second week for 28 weeks)
NQF Credits:	16
Pre-requisites:	BVM 3612 Animal Nutrition and Pasture Science BVM 3700 Veterinary Pharmacology BVM3711 Infectious Diseases I BVM 3712 Infectious Diseases II BVM 3701 General Surgery BVM 3721 Herd Health Management and Economics I
Co-requisites:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1+2 semester (year course)

Module Aims:

The module aims at the developing of appropriate knowledge of the physiology of the oestrus cycle, pregnancy period, parturition and the puerperium period of selected domestic animal species animals. It will include spermatogenesis, oogenesis, anatomy of the reproduction organs. and serves as an introduction course to semen analysis and pregnancy diagnosis. It will also aim at developing the appropriate clinical and surgical skills for selected domestic animals with regards to reproduction (both normal and assisted) and pregnancy and parturition management and diagnosis as well as management of related diseases and disorders of the female and male reproductive systems. It will be a pre-requisite for Theriogenology II

Learning Outcomes:

Upon completion of this module, students should be able to:

1. Discuss and compare physiology of the reproductive cycles in selected domestic animals,
2. Discuss the physiology of pregnancy, parturition and puerperium of selected domestic animals
3. Discuss the physiology of semen production in the male animal
4. Discuss aberrant physiology due to changing photoperiod on the reproductive cycles of the sheep and horse
5. Discuss breeding manipulation including oestrus and ovulation synchronization in selected farm animals
6. Discuss gametogenesis, spermatogenesis and oogenesis, in domestic animals
7. Perform semen analysis.
8. Discuss semen handling and semen freezing in selected domestic species
9. Identify and explain pregnancy determination by ultrasound examination
10. Introduction to ultrasound examination regarding pregnancy examinations
11. Discuss and compare reproductive cycles in selected domesticated animals.
12. Discuss normal fertilization and diagnostic approaches to infertility in selected domestic animals and apply appropriate management strategies
13. Diagnose pregnancy in different domestic animal species and recognize abnormal pregnancy and apply corrective measures
14. Determine when intervention is necessary (including use of obstetrical instruments and performing caesarean sections in the above species)
15. Induce abortion and parturition in selected domestic animal species
16. Manage dystocia and post-partum disorders of the female companion animal including foetotomy and caesarean section
17. Discuss treatment and care of the neonate of selected domestic species
18. Detect and manage infectious and non-infectious diseases and disorders of the male and female companion animal reproductive systems emphasizing causes of abortion
19. Discuss methods of synchronization of the reproductive cycle in selected female animal species
20. Perform semen evaluation and clinical examination of the male reproductive tract
21. Discuss the manipulation animal reproductive cycles towards ensuring successful fertilization through natural or artificial insemination in various species
22. Perform various methods of assisted animal reproduction (including artificial insemination)
23. Perform cryopreservation in selected farm animals and discuss its role in the preservation of animal biodiversity
24. Discuss multiple ovulation embryo transfer and its role in the preservation of animal biodiversity.

Module Content:

This module addresses the anatomy of the reproduction organs, physiology of the reproduction cycles including spermatogenesis and oogenesis. It will handle the introduction to pregnancy diagnosing, semen evaluation and semen preservation and breeding manipulation. By ending the introduction phase, the module will start teaching general reproduction for livestock species, including canine, feline and porcine. The remainder of selected species will be covered in the next module.

Methods of Facilitation of Learning:

Through lectures, class discussions and practicals

Assessment Strategies:

Continuous Assessment: Minimum 4 theory assessments and at least on 2 marked practical assessment. Theory and practical assessments will constitute 75% and 25%, respectively, of the total continuous

assessment mark. The rest of the practicals shall be signed off in the Skills Log Book as per Day-one competency requirements.

Examination: 1 x 2hr practical examination (25%) and 1 x 3hr theory paper (75%). The final exam and CA marks will contribute 60% and 40%, respectively, to the semester mark. Requirements to pass the module a minimum final exam mark of 35% and an average final semester mark of at least 50%.

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- Regular reviews of module content
- Effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	VETERINARY PUBLIC HEALTH II
Module Code:	BVM 3812
NQF Level:	8
Notional Hours:	160
Contact Hours:	Lectures: 4x 1hr lectures per week Practicals: 1x3 hrs every alternate week
NQF Credits:	16
Pre-requisites:	BVM 3651 Veterinary Parasitology I BVM 3652 Veterinary Parasitology II BVM 3711, Infectious Diseases I BVM 3712 Infectious Diseases II BVM 3720 General Pathology
Co-requisites:	BVM 3811 Veterinary Public Health I
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Aims:

This module aims to provide the students with a broad understanding of the principles and programmes within the Namibian veterinary public health system, including environmental health and safety, food inspection and safety, and biological waste management.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. discuss the development and enforcement of laws and regulations impacting food animal processing industries and food consumers
2. discuss the importance of the traceability of animals and animal products as it relates to food safety and disease control
3. perform ante- and post-mortem inspection

4. perform meat inspection in compliance with export and food safety regulations
5. interpret and apply certification requirements of animals and animal products
6. outline approaches to microbiological and physical foodborne hazard identification, testing, sampling and control
7. discuss effective biological waste management strategies

Module Content:

This module should provide the students with a broad understanding of veterinary public health programmes. It includes environmental health, food safety and inspection, as well as biological waste management. It further covers development and enforcement of laws and regulations impacting animal-derived food processing industries and food consumers (e.g. traceability and ante- and post-mortem inspection and certification requirements, with emphasis on meat inspection. Pathological conditions associated with the transport of food animals and meat inspection, Hygiene in abattoirs, Health implications of emergency and causality slaughter. The module outlines approaches to microbiological and physical foodborne hazard identification, testing and sampling; and foodborne hazard prevention and control). Animal welfare standards at abattoirs will also be covered. Ante-mortem inspection of ruminants and pigs and inspection of poultry for human consumption.

Methods of Facilitation of Learning:

Through lectures, class discussions and practicals.

Assessment Strategies:

Continuous Assessment: Minimum 2 theory assessments and at least 5 marked practical assessments

Examination: 1 x 2hr practical examination (40%) and 1 x 3hr theory paper (60%)

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- regular reviews of module content
- effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	WILDLIFE CLINICAL STUDIES II
Module Code:	BVC 3802
NQF Level:	7
Notional Hours:	80
Contact Hours:	3 or 5 hours per week (alternately) of integrated learning and instruction (Lectures and Practicals)
NQF Credits:	8
Pre-requisite:	None
Co- requisite:	BVC 3801 Wildlife Clinical Studies I
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Aims:

This module will provide the basic knowledge and skills required to be able to plan and undertake the physical capture of wildlife, and to be able to use a variety of systems for the remote chemical restraint of wildlife, with an acute awareness of the risks to both animals and people involved in the processes. The module aims to equip the student with the ability to design and practice the safe use of appropriate capture and transport systems, as well as the design of suitable wild animal holding facilities, together with the management of wildlife in bomas and long term captivity. It aims to provide the tools for being able to advise on successful hand rearing systems for orphaned wildlife and the application of good animal welfare principles in the capture, care and transport of wildlife. An opportunity to appreciate the challenges of the major forms of human wildlife conflict and possible mitigating strategies will be provided.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. List the common forms of drug injecting systems, and describe and demonstrate the use of projectile darting systems.
2. Discuss the common causes of capture related injuries and deaths and appreciate the role of stress in wild animal capture
3. Describe and demonstrate appropriate safety procedures when working with wild animals
4. Compare and criticise possible physical capture methods commonly used in southern Africa for a variety of different wildlife species
5. Compare and criticise possible transport systems commonly used in southern Africa for a variety of different wildlife species
6. Plan, participate in and analyse the success of a capture operation
7. Demonstrate appropriate record keeping when capturing, transporting, treating, testing and managing wild animals.
8. Describe suitable facilities for the holding and quarantine of wild animals, and describe appropriate boma managements systems.
9. Discuss different hand-rearing systems for captive wildlife
10. Describe and demonstrate the application of good animal welfare principles within the wildlife arena
11. List the major forms of human wildlife conflict, describe possible mitigation measures and their limitations

Module Content:

This module will cover the theoretical and some practical training on the Knowledge and skills required to capture, transport, care and manage free-ranging and indigenous captive animals.

From a conservation perspective it will cover interventions required in wild animal health to address human-wildlife conflict, metapopulation management through translocation, as well as to reduce the risk from disease in reintroduction and translocation programmes. Additionally relevant aspects of capture and translocation as it relates to the wildlife industry will be presented and discussed.

The principles of chemical and physical restraint systems will also be covered, together with the potential risks of injury and death to wild animals during capture and translocation. Safety issues and procedures in the event of an accident while working with wildlife will be covered. The practical use of a variety of remote and projectile drug injecting and the choice thereof will be covered in depth.

The planning and undertaking of wildlife veterinary capture operations will be presented. Identifying risks to employer and owner, quantifying the risk and plans to mitigate the risk. Regulations pertaining to the use of drugs commonly used in wildlife immobilisation, the movement of game and their products as it relates to conservation and the game industry, and the control of disease within wildlife will be examined.

Design and specifications for holding bomas, long term captive holding and quarantine facilities will be presented together with suitable species-specific equipment and transport systems required for the capture and transport of wildlife. Wildlife handling and boma management (nutrition, disease testing and prevention), and animal welfare issues will be covered. The hand-rearing of the more common game species will be examined.

Methods of Facilitation of Learning:

Through lectures, practicals and class discussions

Assessment Strategies:

Continuous Assessment: Minimum 2 theory assessments and at least 2 marked practical assessments

Examination: 1 x 2hr theory paper (75%) and 1 x 1 hr practical exam (25%)

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- regular reviews of module content
- effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	PRODUCTION ANIMAL CLINICAL STUDIES II
Module Code:	BVC 3832
NQF Level:	8
Notional Hours:	160
Contact Hours:	7 hours / week of integrated learning and instruction (Lectures and Practical)
NQF Credits:	16
Pre-requisites:	BVM 3701 General Surgery BVM 3711 Infectious Diseases I BVM 3712 Infectious Diseases II
Co-requisite:	BVC 3831 Production Animal Studies I
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Aims:

This module aims to provide information on the common disorders of the major body systems of cattle, sheep and goats. Clinical signs, diagnostic tests and treatments options for disorders of individual animals as well as herds and flocks, including preventative care and selected surgical procedures will be emphasized. **The focus of this module will be on hemolymphatic, gastroenterology, and metabolic diseases.**

Learning Outcomes:

Upon completion of this module, students should be able to:

1. discuss the aetiology and pathogenesis of important diseases of ruminants related to the relevant systems

2. diagnose and treat relevant diseases of ruminants
3. describe the anaesthetisation of ruminants using appropriate drugs
4. describe selected surgery of ruminants
5. administer veterinary drugs for treatment in ruminants
6. describe the management and care of ruminant patients
7. Perform basic practical procedures in ruminants

Module Content:

This module provides information on the common disorders of the major body systems of cattle, sheep and goats. Clinical signs, diagnostic tests and treatments options for disorders of individual animals as well as herd management, including preventative care and selected surgical procedures will be emphasized. It focuses on pathophysiology, symptomatology, differential diagnoses, diagnostic approach, clinical management (medical and surgical) and prognosis of the more important/common clinical conditions affecting cattle, sheep and goats related to relevant systems.

Methods of Facilitation of Learning:

Through lectures, class discussions and practicals

Assessment Strategies:

Continuous Assessment: Minimum 2 theory assessments and at least 3 marked practical assessments
 The final examination consist of 1 x 3hr integrated theory paper, as well as a 15 min oral examination.
 The theory paper will contribute 80% towards the examination mark and the oral will contribute 20%.
 A sub-minimum of 35% applies to each of the two sections of the examination.

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- regular reviews of module content
- effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	RESEARCH METHODOLOGY
Module Code:	BVM 3882
NQF Level:	8
Notional Hours:	80
Contact hours:	Lectures: 7 guided self-study online assignments using a blended learning approach
NQF Credits:	8
Pre-requisites:	BVM 3642 Biometry
Co-requisites:	None
Compulsory/Elective:	Compulsory
Semester Offered:	2

Module Aim:

This module will help to prepare students in the formulation and execution of a research project.

Learning outcomes:

Upon successful completion of this module, the student should be able to:

1. Demonstrate knowledge of research processes (reading, evaluating, and developing).
2. Explain the rationale for research ethics (obligations, treatment of data, plagiarism, misconduct, safety, human and animal welfare, intellectual property, conflict of interest).
3. Perform literature reviews using print and online databases.
4. Employ American Psychological Association (APA) formats for citations of print and electronic materials.
5. Identify, explain, compare, and prepare the key elements of a research proposal/report.
6. Explain the principles of the scientific method (formulating research questions, design a study, test a hypotheses).
7. Explain the principles of effective project planning and budgeting.
8. Design a study proposal and timetable.
9. Explain the key concepts of statistics used in scientific research.
10. Design an effective oral and written presentation.

Module Contents:

The module covers the research process: research problem formulation and research objectives, research, methods and principles of research and experimental design, sampling methods including sample size determination and replication; ethics of research; the scientific method; observations, asking questions and formulation of hypothesis (null and alternative), predictions. Biological variation, populations and sampling and statistical significance will be covered.

Scientific writing, a literature review, a research proposal, report writing, plagiarism, finding and using literature references, citation of references, presentation of results will be covered.

Methods of Facilitation in Learning:

Guided online self-study

Assessment Strategies:

Continuous Assessment: 7 evaluated bi-weekly assessments (100%)

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- student evaluation of the module and lecturers at the end of the semester

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	COMPANION ANIMAL CLINICAL STUDIES II
Module Code:	BVM 3890
NQF Level:	8
Notional Hours:	160
Contact Hours:	7 hours per week of integrated learning and instruction (Lectures and Practicals)

NQF Credits:	32
Pre-requisites:	BVC 3800 Companion Animal Clinical Studies I
Co-Requisites:	None
Compulsory / Elective:	Compulsory
Semester Offered:	Year course Semester 1 and 2

Module Aims:

The module prepares students to perform diagnosis, treatment and surgery of dogs and cats in a holistic approach through an integration of multidisciplinary veterinary procedures. **The focus will be on the musculo-skeletal systems, as well as dentistry, neurology and oncology, behavioural problems, emergency care and trauma, ophthalmology, multi-systemic diseases and cage bird / exotic species medicine.** Each student will assist with anaesthesia and surgery (ovariohysterectomy) of a canine patient.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. explain medical or surgical approach to relevant orthopaedic diseases and conditions
2. discuss veterinary diagnostic imaging procedures relevant to the selected organ system
3. perform a thorough neurological examination
4. discuss the diagnosis and approach, as well as medical and surgical treatment of oncology patients
5. describe surgical techniques used in dogs or cats relevant to selected organ systems
6. observe dental diagnosis and treatment
7. perform an uncomplicated dental extraction on a cadaver
8. describe how to diagnose and stabilise emergency conditions and traumatic injuries
9. discuss the diagnosis and treatment of ophthalmological conditions in dogs and cats
10. describe how to anaesthetise critical patients safely
11. describe the provision of emergency medicine and surgery to dogs and cats
12. discuss the management and care for critically ill dogs and cats
13. discuss relevant diagnostic imaging procedures for emergency situations in dogs and cats
14. discuss the diagnosis and treatment of multisystemic diseases in dogs and cats
15. discuss the aetiology, pathogenesis, diagnosis and treatment of the most important diseases of cage birds and exotic species
16. explain the anaesthetisation of cage birds using appropriate drugs
17. explain the relevant diagnostic imaging procedures for cage birds and exotic species
18. discuss the administration of selected veterinary drugs for treatment of cage birds and exotic species
19. discuss the management and care for cage bird and exotic patients
20. assist with both anaesthesia and surgery in a dog or cat

Module Content:

This is a multi-disciplinary module where applied clinical pathology, diagnostic imaging, medicine and surgery are integrated to equip the student with a holistic approach to the diagnosis and treatment of dogs and cats. Topics to be covered include the systems listed above.

Course material will provide students with an understanding of the pathophysiology, diagnosis, clinical management and best medical or surgical treatment options of diseases and trauma affecting various organ systems.

Methods of Facilitation of Learning:

Through lectures, class discussions and practicals. The achievement of clinical skills as prescribed by the Skills Logbook will determine the format and number of practicals required for this module. Lectures and assessments

are either delivered face-to-face or online on the University of Namibia online teaching platform Moodle. Assessments and training of clinical skills will be done face-to-face.

Assessment Strategies:

Continuous Assessment: Minimum of 2 theory assessments and one practical test in each semester, a total of 4 theory assessments and 2 practical tests.

The final examination consist of 1 x 3hr integrated theory paper, as well as a 15 min oral examination.

The theory paper will contribute 80% towards the examination mark and the oral will contribute 20%.

A sub-minimum of 35% applies to each of the two sections of the examination. The continuous assessment will contribute 40% towards the final pass mark and the final examination, 60%.

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- regular reviews of module content
- effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	PRODUCTION ANIMAL CLINICAL STUDIES III
Module Code:	BVC 3871
NQF Level:	8
Notional Hours:	160
Contact Hours:	7 hours / week of integrated learning and instruction (Lectures and Practicals)
NQF Credits:	16
Pre-requisites:	BVC 3831 Production Animal Clinical Studies I BVC 3832 Production Animal Clinical Studies II
co-requisites:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Aims:

This module aims to provide information on the common disorders of the major body systems of cattle, sheep and goats. Clinical signs, diagnostic tests and treatments options for disorders of individual animals as well as herds and flocks, including preventative care and selected surgical procedures will be emphasized. **The focus of this module will be on musculoskeletal diseases, neurology, dermatology, urology and nephrology.**

Learning Outcomes:

Upon completion of this module, students should be able to:

1. discuss the aetiology and pathogenesis of important diseases of ruminants related to the relevant systems
2. diagnose and treat relevant diseases of ruminants
3. describe the anaesthetisation of ruminants using appropriate drugs

4. describe selected surgery of ruminants
5. administer veterinary drugs for treatment in ruminants
6. describe the management and care of ruminant patients
7. Perform basic practical procedures in ruminants

Module Content:

This module provides information on the common disorders of the major body systems of cattle, sheep and goats. Clinical signs, diagnostic tests and treatments options for disorders of individual animals as well as herd management, including preventative care and selected surgical procedures will be emphasized. It focuses on pathophysiology, symptomatology, differential diagnoses, diagnostic approach, clinical management (medical and surgical) and prognosis of the more important/common clinical conditions affecting cattle, sheep and goats

Methods of Facilitation of Learning:

Through lectures, class discussions and practicals

Assessment Strategies:

Continuous Assessment: Minimum 2 theory assessments and at least 3 marked practical assessments
 The final examination consist of 1 x 3hr integrated theory paper, as well as a 15 min oral examination.
 The theory paper will contribute 80% towards the examination mark and the oral will contribute 20%.
 A sub-minimum of 35% applies to each of the two sections of the examination.

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module lecturers at the end of the semester
- regular reviews of and module content
- effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	EQUINE CLINICAL STUDIES (year course)
Module Code:	BVE 3800
NQF Level:	8
Notional Hours:	160
Contact Hours:	7 hours every 2 weeks of integrated learning and instruction (Lectures and Practicals)
NQF Credits:	16
Pre-requisites:	BVC 3722 Clinical Diagnostics
co-requisites:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1 & 2

Module Aims:

This module aims to provide in-depth information on the common disorders of the major body systems of equines. The emphasis will be on clinical signs, diagnostic tests and treatments options for disorders of individual animals. Stable management, including preventative care and selected surgical procedures will also be covered.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. Explain the diagnosis and treatment of the important diseases of equines
2. Explain how to anaesthetise horses safely
3. Explain the diagnostic imaging procedures relevant to specific conditions in equines
4. Describe selected surgical procedures of horses including castration and wound management using specimens and models
5. Discuss the administration of veterinary drugs for treatment of the relevant conditions in equine patients
6. Discuss the management and care of equine patients

Module Content:

This module concentrates on the diagnosis, treatment and control of conditions and diseases affecting the various organ systems of the horse. It gives an integrated approach covering aspects of infectious and parasitic diseases, clinical diagnostics, clinical pathology, diagnostic imaging, medical and surgical treatment options as well as preventative measures.

The module will cover various gastro-enteric, cardio-vascular, urinary and respiratory diseases and conditions. The study of the musculoskeletal disorders will emphasise the incidence, pathophysiology, and diagnosis of lameness. Equine dentistry will include a comprehensive dental examination and routine floating of teeth. Neurology will focus on the neurological examination. Disorders affecting the central and peripheral nervous systems, will be covered, while in dermatology presentation of diseases of the skin and hooves will be dealt with. Common disorders of the haemolymphatic system will be covered. Ophthalmology will focus on the systematic examination of the eye as well as the most common disorders encountered in horses. Oncology will cover basic diagnosis and treatment of important equine neoplasms. Endocrinology will cover the most relevant endocrine conditions in horses. International equine identification criteria, insurance certification as well as pre-purchase examination of horses will be discussed in detail.

Methods of Facilitation of Learning:

Through lectures, class discussions and practicals. Achievement of clinical skills as prescribed by the Skills Logbook will determine the format and number of practicals of this module.

Assessment Strategies:

Continuous Assessment: Minimum 2 theory assessments per semester and one practical test. The final examination consist of 1 x 3hr integrated theory paper, as well as a 15 min oral examination. The theory paper will contribute 80% towards the examination mark and the oral will contribute 20%. A sub-minimum of 35% applies to each of the two sections of the examination.

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- Regular reviews of module content

- Effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	Theriogenology II
Module Code:	BVB 3880
NQF Level:	8
Notional Hours:	160
Contact Hours:	3½ hours per week of integrated learning and instruction (2 hours lectures per week and 3 hours practicals every second week for 28 weeks)
NQF Credits:	16
Pre-requisites:	BVB 3800
Compulsory / Elective:	Compulsory
Semester Offered:	1 +2 semester (year course)

Module Aims:

This module aims at developing the appropriate clinical and surgical skills for selected domestic animals with regards to reproduction (both normal and assisted) and pregnancy and parturition management and diagnosis as well as management of related diseases and disorders of the female and male reproductive systems.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. Discuss and compare reproductive cycles in selected domestic animals.
2. Discuss normal fertilization and diagnostic approaches to infertility in selected companion animals and apply appropriate management strategies
3. Diagnose pregnancy in different companion animals species and recognize abnormal pregnancy and apply corrective measures
4. Determine when intervention is necessary (including use of obstetrical instruments and performing caesarean sections in the above species)
5. Induce abortion and parturition in selected domestic animal species
6. Manage dystocia and post-partum disorders of the female companion animal including foetotomy and caesarean section
7. Detect and manage infectious and non-infectious diseases and disorders of the male and female companion animal's reproductive systems emphasizing causes of abortion
8. Discuss methods of synchronization of the reproductive cycle in the female animal
9. Perform semen evaluation and clinical examination of the male reproductive tract
10. Perform bull and ram breeding soundness examinations including sheath scraping and various diagnostic tests for common diseases affecting reproduction
11. Discuss the manipulation animal reproductive cycles towards ensuring successful fertilization through natural or artificial insemination in various species
12. Perform various methods of assisted animal reproduction (including artificial insemination)
13. Discuss multiple ovulation embryo transfer and its role in the preservation of animal biodiversity.

Module Content:

The module covers the principles of assisted animal reproduction in livestock and equines including; breeding soundness examination, semen collection and processing, reproductive cycle synchronization, artificial insemination and embryo transfer.

Methods of Facilitation of Learning:

Through lectures, class discussions and practicals

Assessment Strategies:

Continuous Assessment: Minimum 4 theory assessments and at least on 2 marked practical assessment. Theory and practical assessments will constitute 75% and 25%, respectively, of the total continuous assessment mark. The rest of the practicals shall be signed off in the Skills Log Book as per Day-one competency requirements.

Examination: 1 x 2hr practical examination (25%) and 1 x 3hr theory paper (75%). The final exam and CA marks will contribute 60% and 40%, respectively, to the semester mark. Requirements to pass the module a minimum final exam mark of 35% and an average final semester mark of at least 50%.

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- regular reviews of module content
- effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	VETERINARY PROFESSIONAL SKILLS
Module Code	BVM 3880
NQF Level	8
Notional Hours:	80
Contact hours	Lectures: 1 x 1hr lecture per week
NQF Credits	8
Pre-requisite	None
CO-requisite	None
Compulsory/Elective	Compulsory
Semester Offered	1 and 2

Module Aims:

This module aims to develop important skills, knowledge and attributes required by the veterinarian as a professional. The emphasis will be on developing the following skills: interpersonal skills, communication skills, stress and stress management, and business enterprise skills. In addition, this module also aims to provide students with a general understanding of state and private business management.

Learning Outcomes/Specific Outcomes:

Upon completion of this module, students should be able to:

1. plan the establishment of a new veterinary clinic including the identification of the required resources
2. manage a private veterinary clinical practice as a business enterprise
3. manage a state owned veterinary office including the control of human, financial and material resources
4. create a conducive work environment by motivating staff and creating teamwork
5. compile an annual budget for a veterinary clinic and control finances
6. conduct good practices in veterinary practice/hospital
7. Identify sources and symptoms of stress and practice stress management techniques
8. Manage personal expenditure
9. maintain good client relationships through effective communication and client consultation skills
10. demonstrate skills in interpersonal communication with staff and clients
11. maintain high ethical and professional standards

Module Content:

Concepts of animal health consultation; stress and its management; effective communication skills (basic communication and consultation skills based on a predominantly relationship-centred style, being able to apply and identify effective clinical interviewing techniques); business budgeting skills, identifying sources and symptoms of stress and practicing stress management techniques). This module also covers business management including personal and business finance, marketing and teamwork, communication and professionalism. Staff management and budgeting, and control of finances will be a major section of this module. Veterinary ethics, interpersonal communication, interpersonal skills as well as client relationship will also be discussed.

Methods of Facilitation of Learning:

Through lectures, real life simulations, case studies

Assessment Strategies:

Continuous Assessment: 100 % (Minimum 3 assessments)

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- student evaluation of the module and Lecturers at the end of the semester

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title: WILDLIFE CLINICAL STUDIES III

Module Code: BVM 3861

NQF Level: 8

Notional Hours: 80

Contact Hours: 5 hours of integrated theory and practicals/ week

NQF Credits: 8

Pre-requisites: BVC 3801 Wildlife Clinical Studies I
BVC 3802 Wildlife Clinical Studies II
Compulsory / Elective: Compulsory
Semester Offered: 1

Module Aims: Module Aims: This module will equip the student to undertake the chemical restraint of the majority of commonly managed wildlife species in Namibia by way of use of drugs routinely used for immobilisation, anaesthesia, sedation and tranquilisation. In particular it will focus on the use of the Schedule 5 drugs as registered in Namibia for wildlife capture, and provide a comprehensive appreciation of the relevant Namibian legislation pertaining to the control of dangerous drugs. The module will equip the student, on qualifying, with all the requirements to be able to register with the Namibian Veterinary Council's additional professional Category of "Wildlife"

Learning Outcomes:

Upon completion of this module, students should be able to:

1. List, describe and discuss the use of drugs used in the capture, care and transport of a variety of commonly managed wildlife in Namibia, with particular emphasis on the Schedule 5 drugs as listed in Namibia
2. Explain potential side effects of drugs commonly used in the chemical restraint of wild animals and how to deal with these side effects
3. Describe basic physiology and pharmacology as it relates to the restraint of wild animals
4. Describe the Namibian legislation regulating the use of Schedule 5 drugs in Namibia
5. Manage the capture, care and transport of wildlife using appropriate drugs, with particular emphasis on Schedule 5 drugs
6. Demonstrate appropriate first aid in the case of accidental human exposure to S5 drugs
7. Describe how to maintain appropriate records of S5 drugs as described by Namibian legislation
8. Demonstrate safe use of a dart gun

Module Content:

This module will cover an in-depth look into the capture, care and transport of the more common species chemically restrained and transported in southern Africa. This will be carried out on a species (or group of species) by species basis and will involve theoretical as well as extensive practical training.

Emphasis will be placed on animal welfare, stress and capture-related deaths, safety and first aid in the field as it applies to weapons, drugs, humans and animals, the recording of wildlife procedures and the use of helicopters and fixed wing aircraft in wildlife work. In particular focus will be on the Schedule 5 drugs, their use and the regulations pertaining to the possession and administration of the opioids routinely used in wildlife work.

Methods of Facilitation of Learning:

Through lectures, practicals and class discussions

Assessment Strategies:

Continuous assessment: Minimum 2 theory assessments and at least 2 marked practical assessments

Examination: 1 x 2hr practical examination (25%) and 1 x 3hr theory paper (75%).

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field

- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- regular reviews of module content
- effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title: VETERINARY EPIDEMIOLOGY I

Module Code:	BVM 3871
NQF Level:	8
Notional Hours:	160
Contact Hours: Lectures:	4 x 1hr / week
Tutorials:	1 x 3hr / alternate week
NQF Credits:	15
Pre-requisites:	BVM 3642 Biometry BVM 3711 Infectious diseases I BVM 3712 Infectious diseases II
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1

Module Aims:

To provide students with an understanding of the basic concepts of veterinary epidemiology with regards to disease causality, disease risk factors and their influence on the patterns of disease occurrence and their measurement, investigative veterinary epidemiology including practical exercises on the strengths and weaknesses of different epidemiological study designs which will be compared and discussed within the framework of evidence-based medicine in order to judge the benefits of treatment and/or prevention and control methods.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. discuss epidemiological concepts, definitions, purpose, meaning and scope of the discipline
2. explain the concepts of disease ecology, disease causality, patterns of disease occurrence
3. explain the determinants of health and disease
4. apply epidemiological and statistical measures of association
5. describe the disease events in populations
6. discuss the host-agent-environmental interaction
7. Interpret the temporal, spatial and clustering distribution of disease events with regards to factors responsible for their distribution
8. discuss concepts of bias, confounding and interaction as they relate to disease causality and explain how they are controlled
9. explain and measure disease frequency in terms of prevalence, incidence, morbidity and mortality
10. (moved to BVM3732 Veterinary Epidemiology II) explain the different sampling methods and their application in epidemiological investigations

11. determine sample sizes for estimating disease prevalence, detection of disease and production parameters
12. describe the design of observational and experimental epidemiological studies as well as clinical trials
13. discuss errors due to observational measurement with regards to validity, accuracy and precision
14. interpret laboratory results in terms of diagnostic sensitivity, specificity, positive and negative predictive values, measuring agreement between tests as well as series and parallel interpretation of diagnostic test results
15. explain the principles of diagnostic pathways in terms of screen and confirmatory testing procedures
16. describe the principles and concepts of diagnostic-test validation and performance,

Module Content:

The module will cover the introduction to epidemiological concepts, definitions, purpose, meaning and scope of the discipline, disease causation, intrinsic and extrinsic determinants of disease, disease ecology and disease transmission. The disease events in populations and measuring disease frequency and production will be described. The host-agent-environmental interaction, temporal, spatial and clustering factors will be explained as well as in-depth application of epidemiological and statistical measures of association will be explained. Concepts of bias, confounding and interaction variables and their control will be explained. The application of concepts and design of observational epidemiological studies and sampling methodology, and sample size determination in the measurement of disease, describing errors due to measurement and interpreting laboratory results will be covered as well as principles and concepts of diagnostic-test validation and performance and clinical trial will be discussed.

Methods of Facilitation of Learning:

Through lectures, tutorials and case studies,

Assessment Strategies:

Continuous Assessment: minimum 3 assessments

Examination: 1 x 3 hr paper

Quality Assurance Arrangements:

- The quality of this module will be assured through the following activities:
- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- regular reviews of module content
- effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: scientific calculator, laptop computer

Additional Costs: None

Module Title: RESEARCH PROJECT
Module Code: BVC 3880
NQF Level: 8

Notional Hours:	260
Contact Hours:	N/A
NQF Credits:	26
Prerequisites:	BVM 3882 Research Methodology
CO-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1 and 2

Module Aims:

Each student will be required to complete a Research Project, compile a written report and give an oral presentation on a relevant topic selected by the student and approved by the supervisor.

Learning Outcomes:

Upon completion of this module, students should be able to:

1. Design, formulate and carry out an independent research project on a chosen topic under supervision
2. Communicate research results both orally and in writing

Module Content:

Independent research on a chosen topic in any field of veterinary medicine

Methods of Facilitation of Learning:

Independent study

Assessment Strategies:

Continuous Assessment 100%: Oral presentation (20%) and written research report (80%)

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- external moderation of research report
- student evaluation of the module and lecturers at the end of the semester
- Regular reviews of module content

Requirements:

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	PRODUCTION ANIMAL CLINICAL STUDIES IV
Module Code:	BVC 3872
NQF Level:	8
Notional Hours:	160
Contact Hours:	7 hours / week of integrated learning and instruction (Lectures and Practicals)
NQF Credits:	16
Pre-requisites:	BVC 3831 Production Animal Clinical Studies I BVC 3832 Production Animal Clinical Studies II
Co-requisite:	BVC 3871 Production Animal Clinical Studies III

Compulsory / Elective: Compulsory
Semester Offered: 2

Module Aims:

This module aims to provide information on the common disorders of the major body systems of cattle, sheep and goats. Clinical signs, diagnostic tests and treatments options for disorders of individual animals as well as herds and flocks, including preventative care and selected surgical procedures will be emphasized. **The focus of this module will be on ruminant cardio-respiratory diseases and important diseases and conditions of sheep and goats.** (Endocrine disorders, ophthalmology and oncology of production animals will be covered in Companion Animal Clinical Studies IV).

Learning Outcomes:

Upon completion of this module, students should be able to:

1. discuss the aetiology and pathogenesis of important diseases of ruminants related to the relevant systems
 2. diagnose and treat important cardio-respiratory diseases of ruminants
 3. diagnose and treat important diseases and conditions of sheep and goats
 4. administer veterinary drugs for treatment in ruminants
 5. describe the management and care of ruminant patients
- Perform basic practical procedures in ruminants

Module Content:

This module provides information on the common disorders of the major body systems of cattle, sheep and goats. Clinical signs, diagnostic tests and treatments options for disorders of individual animals as well as herd management, including preventative care and selected surgical procedures will be emphasized. It focuses on pathophysiology, symptomatology, differential diagnoses, diagnostic approach, clinical management (medical and surgical) and prognosis of the more important/common clinical conditions affecting cattle, sheep and goats.

Methods of Facilitation of Learning:

Through lectures, class discussions and practicals

Assessment Strategies:

Continuous Assessment: Minimum 2 theory assessments and at least 3 marked practical assessments
The final examination consist of 1 x 3hr integrated theory paper, as well as a 15 min oral examination.
The theory paper will contribute 80% towards the examination mark and the oral will contribute 20%.
A sub-minimum of 35% applies to each of the two sections of the examination.

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- regular reviews of module content
- effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	VETERINARY EPIDEMIOLOGY II
Module Code:	BVM 3872
NQF Level:	8
Notional hours:	80
Contact hours:	Lectures: 2 x 1hr lectures per week each semester Tutorials: 1 x 3hr / alternate week during the semester
NQF Credits:	8
Pre-requisites:	BVM 3642 Biometry BVM 3711 Infectious Diseases I BVM 3712 Infectious Diseases II
Co-requisites:	BVM 3871 Veterinary Epidemiology I
Compulsory/Elective:	Compulsory
Semester Offered:	2

Module Aim:

The focus of this module will be on applied aspects veterinary epidemiology and will include practical exercises and case studies.

Learning outcomes:

Upon successful completion of this module, the student should be able to:

1. apply principles of disease surveillance, monitoring systems, survey design, epidemiological data and information management including the use of computer software including Geographic Information System
2. conduct qualitative risk analyses and explain their application to animal health decision making processes.
3. apply epidemiological principles to disease control and their application in state and international veterinary medicine
4. plan, formulate, design and explain processes involved in managing and implementing disease control, prevention, eradication programmes at local, state and international levels
5. explain the principles of outbreak and epidemiological investigation
6. apply the principles of emergency preparedness and contingency planning in the management of disease outbreaks
7. describe the principles of questionnaire based survey design
8. design a questionnaire for epidemiological studies
9. discuss and apply the concepts of one health in policy and strategy formulation
10. communicate effectively on the health of animal and human populations to a range of audiences, including the general public, farmers, researchers, politicians and other key policy makers

Module Contents:

This module covers data and information management, principles and applications of questionnaire design and use of geographic information systems application in data analysis, applying concepts of monitoring and surveillance, survey design including principles of risk based surveillance. Introduction to risk analysis and its application to veterinary medicine will be covered. Planning, designing, managing and implementing disease control, prevention, eradication programmes at different levels including epidemiological investigation, emergency preparedness and contingency planning, awareness, and communication and extension methods. The One Health Concept will be introduced.

Methods of Facilitation in Learning:

Through lectures, case studies and tutorials

Assessment Strategies:

Continuous Assessment: minimum 3 assessments

Examination: 1 x 2hr paper

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- periodic upgrading of laboratory facilities following new technology developments 54

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: Scientific Calculator and Laptop Computer

Additional Costs: None

Module Title:	POLICY, LEGISLATION AND JURISPRUDENCE
Module Code:	BVM 3842
NQF Level:	8
Notional Hours:	80
Contact Hours:	Lectures: 2 x 1hr / week
NQF Credits:	8
Pre-requisites:	None
Co-requisites:	None
Compulsory / Elective:	Compulsory
Semester Offered:	2

Module Aims:

This module aims to provide the student with an overview of public policy through legislation, regulation and operational strategy for Namibia. The relevant regional and international material will be covered. (delete)

Learning Outcomes:

Upon completion of this module, students should be able to:

1. differentiate between policy, legislation and regulations
2. discuss processes involved in the formulation of public policy and legislation
3. know and apply the relevant legislation as related to the practice of veterinary medicine in Namibia
4. explain the role of jurisprudence in the practice of veterinary medicine

Module Content:

This module will provide the student with an overview of the formulation and implementation of public policy through legislation, regulation and operational strategy. Focus will be on Namibian legislation regulating the veterinary profession veterinary medicines, animal health, certification, animal welfare, and trade in animals and animal products in Namibia.

A thorough knowledge and understanding of the legislation governing the practice of veterinary science by professionals and para-professionals are required, including the code of conduct, veterinary ethics and rules.

Methods of Facilitation of Learning:

Through lectures, tutorials, class discussions

Assessment Strategies:

Continuous Assessment: minimum 2 theory assessments

Examination: 1 x 2hr paper

Quality Assurance Arrangements:

The quality of this module will be assured through the following activities:

- module review in consultation with experts in the subject field
- internal and external moderation of examination papers and answer scripts
- student evaluation of the module and lecturers at the end of the semester
- regular reviews of module content
- effective supervision and monitoring of assignments, tests and examinations

Module Requirements:

University of Namibia regulations pertaining to class attendance will apply.

Equipment to be bought: None

Additional Costs: None

Next scheduled review: 2020

Module Title:	CLINICAL ROTATION
Module Code:	BVC 3890
NQF Level:	8
Notional Hours:	880
Contact Hours:	36 weeks
NQF Credits:	140
Prerequisites:	All modules from BVM I to BVM V
Co-requisite:	None
Compulsory / Elective:	Compulsory
Semester Offered:	1 and 2

Module Aims:

The module is designed to develop and enhance the practical skills of students to enable them to attain the OIE recommended "Day 1 competencies" as well as the Namibian Veterinary Council requirements. The rotations will be done under supervision of unconditionally registered veterinarians and other professionals.

Learning Outcomes:

Upon completion of this module students will be able to:

1. Perform all the "Day 1 competencies" for a veterinarian as recommended by the OIE and NVC

Module content:

Each student will be required to successfully complete a number of clinical rotations including core or compulsory rotations and elective rotations, as per the individual schedule prepared for each student.

Assessment Strategies:

Continuous assessment: Compulsory submission of completed clinical skills logbook. Marking rubrics designed for each rotation (subminimum for each rotation 40%).

Examination:

A. 4 theory papers:

1. **Companion Animal Clinical Studies** (canine, feline, equine, cage birds; incorporating medicine, surgery, anaesthesiology, pharmacology, toxicology, infectious diseases, theriogenology, nutrition, diagnostic imaging, parasitology, clinical pathology, animal welfare)
2. **Production Animal Clinical Studies** (bovine, ovine, caprine, porcine, poultry, fish, bees and wildlife; incorporating medicine, surgery, anaesthesiology, theriogenology, pharmacology, nutrition and pasture science, toxicology, infectious diseases, diagnostic imaging, parasitology, herd health, clinical pathology, animal welfare)
3. **VPH and Pathology** (all species, incorporating Veterinary Public Health, food safety systems, general pathology, systemic pathology, animal welfare and ethology, histology and histopathology, toxicology, parasitology)
4. **Epidemiology and Regulatory Medicine** (all species; incorporating epidemiology, Policy, Legislation and Juris Prudence, veterinary professional skills, infectious diseases, toxicology, herd health, State and Private vet practice)

B. 3 practical exams:

1. **Companion Animal:** clinical case workup of a canine or feline **and** an equine patient, **and** sterilisation of a dog or cat,
2. **Production Animal:** clinical case workup of a ruminant patient, **and** Pregnancy diagnosis of 4 cows
3. **VPH and Pathology:** diagnosis or opinion/judgement of fresh and preserved post mortem specimens, samples and/or findings (gross and microscopic)

Subminimum for each paper, theory and practical: 40%.

Final calculation of exam mark: 4 Theory exam papers (50% of final mark); 3 practical exams (50% of final mark)

Final mark: 50% continuous assessment (log book plus clinical rotations) and 50% Exam mark

Pass mark: 50%

Prospectus 2022