FACULTY OF HEALTH SCIENCES & VETERINARY MEDICINE

School of Veterinary Medicine

Prospectus 2023

UNAM
UNIVERSITY OF NAMIBIA

The ENGAGED University @30
1992 - 2022

PROSPECTUS 2023

SCHOOL
OF
VETERINARY MEDICINE

NOTE

This Prospectus is only valid for 2023 as regulations and syllabi may be amended for 2023. The general regulations and further information appear in the General Information and Regulation Prospectus.

Although the information contained in this Prospectus has been compiled as accurately as possible, it is possible that errors and omissions have inadvertently occurred, for which we apologise in advance. The University reserves the right to amend any regulation or stipulation without notice. The information is correct up to 30 November 2022.

The fact that particulars of a specific module or programme have been included in this Prospectus does not necessarily mean that the module or programme will be offered in 2023.

This Prospectus must be read in conjunction with the *General Information and Regulations Prospectus 2023*.

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

☎ (+264 61) 206 4043 🖷 (+264 61) 206 4027 💻 amarais@unam.na ✉ Private Bag 13301 Windhoek, Namibia

Associate Dean:	Dr A Marais: BVSc (University of Pretoria); BSc (Hons); MSc (Stellenbosch University); PhD (University of Pretoria)
Administrative Officer:	Mrs. Laivi Cardoso: Higher Diploma in Business Information System
Assistant Faculty Officer:	Mr U Tjiho: Bachelor of Marketing (Polytechnic of Namibia); Bachelor of Business Management Honours (Namibia University of Science and Technology).
Adjunct - Psychologist:	Ms B Hoffmann: MA (Ind & Org Psych), PCC (ICF), CPRP (PRISA), CHRP (IPMN)

DEPARTMENT of VETERINARY PRE-CLINICAL STUDIES (Neudamm Campus)

☎ (+264 61) 206 4168 🖷 (+264 61) 206 4027 💻 schitanga@unam.na ✉ Private Bag 13301 Windhoek, Namibia

Head of Department:	Prof S Chitanga: BVSc (University of Zimbabwe); MSc (Institute of Tropical Medicine, Belgium); PhD in Veterinary Medicine (University of Ghent, Belgium).
Senior Lecturer:	Dr B Mushonga: BSc (Hons) Veterinary Anatomy; BVSc (University of Zimbabwe); MSc Veterinary Pathology (University of Utrecht)
Senior Lecturer:	Dr C Musara MSc (University of Liverpool, UK). BVSc (University of Zimbabwe, Zimbabwe).
	MSc (Hons (University of Zimbabwe, Zimbabwe).
Senior Lecturer:	Dr O Madzingira: MSc (University of Liverpool, UK,), BVSc (University of Zimbabwe, Zimbabwe) MSc (Hons) (University of Zimbabwe, Zimbabwe).
Lecturer:	Dr B Chiwome: BVSc (University of Zimbabwe)
Lecturer:	Dr B Kaurivi: BSc (Biology) (University of Namibia); BVSc (University of Zimbabwe); MVSc (University of Sidney); PhD (Massey University)
Lecturer:	Dr S Chinyoka: MSc (University of Liverpool, UK) BVSc (University of Zimbabwe, Zimbabwe) MSc (Hons) – Veterinary Physiology (University of Zimbabwe, Zimbabwe).
Lecturer:	Dr E Muradzwika: BVSc (University of Zimbabwe)
Assistant lecturer:	Dr S Simasiku: BVM (University of Namibia)
Vet. Para-professional:	Mr U Ujava: Dip Agric (University of Namibia)
Vet. Para-professional:	Ms CO Matomola: Dip. Anim. Health (University of Namibia)
Technologist:	Ms. V N Ndjoze-Siririka: BSc (Hons) Microbiology (University of Namibia)
Technologist:	Ms E Mwenda: BSc (Hons) (University of Namibia, Namibia), BSc – Environmental Biology and Molecular and Physiological Biology (University of Namibia, Namibia)
Field Technician:	MrN Simasiku: Dip Anim Health (University of Namibia)

DEPARTMENT OF Veterinary Para-Clinical Studies (Neudamm Campus)

☎ (+264 61) 206 4055 🖷 (+264 61) 206 4027 💻 mhemberger@unam.na ✉ Private Bag 13301 Windhoek, Namibia

Head of Department:	Dr M Y Hemberger: DVM (Giessen University – Germany); PhD (Giessen University – Germany)
Associate Professor:	Prof J R Lyaku: BVSc (Sokoine University of Agriculture, Tanzania); MVSc (University of Edinburgh, Scotland); PhD in (University of Glasgow, Scotland)
Senior Lecturer:	Dr M Y Hemberger: DVM (Giessen University – Germany); PhD (Giessen University – Germany)
Senior Lecturer:	Dr J Yabe: BVM (University of Zambia), MSc. (University of Zambia); PhD (Hokkaido University, Japan)
Senior Lecturer:	Dr U Molini: DVM (University of Teramo - Italy), MSc (University of Teramo - Italy); PhD (University of Teramo - Italy)
Associate Professor:	Prof C Ntahonshikira: BVM, MSc (National Agricultural University of Ukraine); PhD (Kiev Veterinary Research Institute)
Lecturer	Dr F Chitate: BVSc (University of Zimbabwe); MSc (University of Reading)
Lecturer:	Dr D Mudimba: BVSc (University of Zimbabwe)
Technologist:	Ms K Mwaningange: National Diploma in Agriculture (University of Namibia); BSc Agric (Hons) Food Science and Tech (University of Namibia)
Technologist:	Ms M M N Amukwaya: BSc (Hons) Microbiology and Chemistry (University of Namibia); MSc Clinical Microbiology and Infectious Diseases (University of Edinburgh)
Technologist:	Mr. A Shoolongela: National Diploma in Agriculture (University of Namibia), BSc (Hons) Food Science and Tech (University of Namibia)
Technologist:	Ms. E Iyambo: National Diploma in Food Science (University of Namibia)
Vet. Para-professional:	Mr. J. Simataa: Diploma in Animal Health (University of Namibia)

DEPARTMENT OF COMPANION ANIMAL CLINICAL STUDIES (Neudamm Campus)

☎ (+264 61) 206 4112 🖷 (+264 61) 206 4027 💻 rhassel@unam.na ✉ Private Bag 13301 Windhoek, Namibia

Head of Department:	Dr A Raath: BVSc (University of Pretoria)
Associate Professor:	Prof F Stegmann: BVSc, MMed Vet (University of Pretoria)
Senior lecturer:	Dr A Marais: BVSc (University of Pretoria); BSc (Hons); MSc (Stellenbosch University); PhD (University of Pretoria)
Lecturer:	Dr L de Villiers: BVSc, MSc (University of Pretoria)
Adjunct Lecturer:	Prof J Schoeman: BVSC, MMedVet, PhD (University of Pretoria)

Adjunct Lecturer:	Dr V Mc Clure BVSc, M. Med. Vet, (University of Pretoria)
Adjunct Lecturer:	Dr D Marggraff BVSc (University of Pretoria
Adjunct Lecturer:	Dr D. Rodenwoldt: BVSc (University of Pretoria)
Staff Development Fellow:	Dr S Nambinga: BVM (University of Namibia)
Staff Development Fellow:	Dr P Nginamitho: BVM (University of Namibia)
Vet. Para-professional:	Mr B Muzo Dip. Animal Health (University of Namibia)

DEPARTMENT OF PRODUCTION ANIMAL CLINICAL STUDIES (Neudamm Campus)

☎ (+264 61) 206 4111 🖷 (+264 61) 206 4027 💻 asamkange@unam.na ✉ Private Bag 13301 Windhoek, Namibia

Head of Department:	Dr A Samkange: BVSc (University of Zimbabwe); MSc (University of Pretoria)
Senior Lecturer:	Dr A Samkange: BVSc (University of Zimbabwe); MSc (University of Pretoria)
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)
Senior Lecturer:	Dr P Mbiri: BVSc (University of Zimbabwe); MSc (University of Pretoria)
Lecturer:	Dr I Kaatura: Nat. Dip. Agric., BVM (University of Zambia); PGDM (Stellenbosch)
Staff Development Fellow:	Dr I Amuthitu: BVM (University of Namibia)
Staff Development Fellow:	Dr Vaino Kuume (University of Namibia)
Adjunct Lecturer:	Dr B.E. Voigts: BVSc (University of Pretoria)
Adjunct Lecturer:	Dr Arnold Olivier: BVSc (University of Pretoria)
Adjunct Lecturer:	Dr O Aschenborn: BVSc (University of Pretoria); MSc (Sterling, Scotland)
Paraprofessional:	Mr Linus Mujiwa: Dip Anim Health (UNAM)
Paraprofessional:	Mr S Ndana: Dip Anim Health (UNAM)
Paraprofessional:	Mr P Awasman: Dip Agric

Veterinary Academic Hospital (Main Campus and Neudamm Campus)

☎ (+264 81) 6628403 💻 rhassel@unam.na ✉ Private Bag 13301 Windhoek, Namibia

Head of Hospital:	Dr R Hassel: BVSc (University of Pretoria); PhD (Berlin)
Hospital Administrator:	Mr B Tjizu: BA Hons Industrial Psychology and Sociology (University of Namibia)
Senior Clinician/ Head of Section:	Dr I. Baines: BVSc (University of Pretoria)

Senior Clinician/ Head of Section: Dr V.G. Mutjavikua: BVSc (University of Pretoria)

Senior Clinician: Dr M Beggs BVSc (University of Pretoria)

Senior Clinician: Dr F van der Linde BVSc (University of Pretoria)

Clinician: Dr M Dahlberg: BVSc (University of Pretoria)

Clinician: Dr J Smith BVM (University of Namibia)

Clinician: Dr B Nyahoda (University of Namibia)

Junior Clinician: Dr F Nyathi: BVM (University of Namibia)

Junior clinician: Dr E Nambinga: BVM (University of Namibia)

Adjunct Lecturer: Dr D. Rodenwoldt: BVSc (University of Pretoria)

Adjunct lecturer: Dr S Abrahams: BVM (University of Namibia

Veterinary Nurse: Sr M Loschke: Dip. Vet. Nursing (University of Pretoria)

Veterinary Nurse: Sr N Foerster: Dip. Vet. Nursing (University of Pretoria)

Theatre Assistant : Ms J. Shiingidwa Dip. Animal Health (University of Namibia)

Academic Year Due Dates for the 2023

DATE	GENERAL DATES
20 January	Last day for registration of senior students – Faculty of Health Sciences and Veterinary Medicine
31 January	Last day for appeals (Semester 2 and Double modules of Regular and Supplementary/Special examinations of November 2022)
03 February	Last day for application of retention of continuous assessment (CA) mark and to sit for Promotional Examinations Last day for late registration of new curriculum students (Late fee payable)
08 February	Last day for schools to approve the retention of continuous assessment (CA) mark and promotional examination applications
10 February	Last day for application of module(s) exemptions – New Curriculum Students
17 February	Last day for registration of senior students (Late fee payable) Last day for application of module(s) exemptions – Senior Students Last day for approval of module(s) and qualification changes – Senior Students
22 February	Promotion Examination
24 February	Last day for approval of module(s) exemptions – New Curriculum Students
10 March	Last day for approval of module(s) exemptions – Senior Students
12 April	Last day to change offering types and examinations centres – distance students
30 April	Last day to submit thesis for the October 2024 graduation
04 August	Last day for appeals (First and second opportunity examinations of the First Semester 2023)
31 August	Last day to submit outstanding documentation
12 September	Last day to change offering types and examinations centres – distance students
31 October	Last day to submit thesis for the April 2024 graduation

DATE	CANCELLATION DUE DATES
17 April	Last day to cancel Semester 1 modules
29 September	Last day to cancel Semester 2 modules
29 September	Last day to cancel Double modules (module that extends over one academic year)
DATE	**FINANCE DUE DATES**
6 February	Last day to cancel Core Semester modules with 100% credit
15 February	Last day to cancel Core Semester modules with 50% credit
1 March	Last day to cancel Semester 1 and year modules with 100% credit – Old Curriculum Students
20 March	Last day to cancel Semester 1 and year modules with 100% credit – New Curriculum Students
29 March	Last day to cancel Semester 1 modules with 50% credit – Old Curriculum Students
17 April	Last day to cancel Semester 1 modules with 50% credit – New Curriculum Students
7 July	Last day to cancel year modules with 50% credit – Old and New Curriculum Students
2 August	Last day to cancel Semester 2 modules with 100% credit – Old Curriculum Students
9 August	Last day to cancel Semester 2 modules with 100% credit – New Curriculum Students
1 September	Last day to cancel Second Semester modules with 50% credit – All Students

Admission requirements

The minimum admission requirements into the Bachelor of Veterinary Medicine programme are as follows:

(a) A Namibian Senior Secondary Certificate (NSSC) at NSSCO (Ordinary Level) and NSSCAS (Advanced Subsidiary Level) with a minimum of 35 points in five subjects on the UNAM Evaluation Scale; or a recognized equivalent qualification.

In addition to the above, the following subjects and grades will be required:

i. English with a minimum B symbol or better at NSSC Ordinary Level, or a minimum d or better at NSSCAS Level

ii. Biology with a minimum c symbol or better at NSSCAS Level

iii. Mathematics with a minimum c symbol or better at NSSCAS Level

iv. Chemistry with a minimum c symbol or better at NSSCAS Level

v. One additional subject, preferably Physical Science, with a minimum B symbol or better at NSSC Ordinary Level or a minimum d symbol or better at NSSCAS Level

OR

(b) A Namibian Senior Secondary Certificate (NSSC), obtained prior to 2021, at NSSC-O (Ordinary Level) and NSSC-H (Higher Level) with a minimum of 35 points in five subjects on the UNAM Evaluation Scale; or a recognized equivalent qualification.

In addition to the above, the following subjects and grades will be required:

i. English with a minimum B symbol or better at NSSC Ordinary Level, or a score of 3 or better at NSSC Higher level

ii. Biology (or Life Science) with a minimum B symbol or better at NSSC Ordinary Level, or a score of 3 or better at NSSC Higher Level

iii. Mathematics with a minimum B symbol or better at NSSC Ordinary Level, or score of 3 or better on NSSC Higher level

iv. Physical Science or Chemistry with a minimum B symbol or better at NSSC Ordinary Level, or a score of 3 or better at NSSC Higher Level

Candidates who do not qualify for admission to the Bachelor of Veterinary Medicine programme with the above admission criteria may be admitted into the **Bachelor of Veterinary Medicine extended programme**. The minimum admission requirements into the Bachelor of Veterinary Medicine extended programme are as follows:

A Namibian Senior Secondary Certificate (NSSC), obtained prior to 2021, at NSSCO (Ordinary Level) with a minimum of 30 points in five subjects on the UNAM Evaluation Scale; or a recognized equivalent qualification.

In addition to the above, the following subjects and grades will be required:

i. English with a minimum C symbol or better at NSSC Ordinary Level

ii. Biology with a minimum B symbol or better at NSSC Ordinary Level

iii. Mathematics with a minimum C symbol or better at NSSC Ordinary Level

iv. Chemistry with a minimum C symbol or better at NSSC Ordinary Level

v. One additional subject, preferably Physical Science, with a minimum C symbol or better at NSSC Ordinary Level

OR

(c) A Namibian Senior Secondary Certificate (NSSC) at NSSCO (Ordinary Level) and NSSCAS (Advanced Subsidiary Level) with a minimum of 27 points in five subjects on the UNAM Evaluation Scale; or a recognized equivalent qualification.

In addition to the above, the following subjects and grades will be required:

i. Five subjects that must include English, Mathematics, Biology and Chemistry with Physical Science as a preferred fifth subject.

ii. Three of the five subjects at NSSC Ordinary Level with a minimum C symbol and two of the five subjects at NSSCAS Level with minimum d symbol.

The extended Bachelor of Veterinary Medicine programme consists of the first year of Bachelor of Science modules consisting of Biology, Mathematics, Chemistry and Physical Science.

(d) Alternatively, candidates not admitted on the Bachelor of Veterinary Medicine extended programme who have successfully completed the entire first year of a BSc curriculum, may be admitted into the first year of the Bachelor of Veterinary Medicine programme if they have passed all basic science modules (e.g. Biology, Mathematics, Physical Science and Chemistry) with a minimum score of 60% in each of these modules.

(e) Candidates with a three-year Diploma in Animal Health or Higher Diploma in Agriculture or related field, with a combined average pass of 65% or higher, with no subject less than 60%, from a recognized and accredited institution, may be granted admission to the Bachelor of Veterinary Medicine degree programme at the discretion of the School.

(f) Candidates may be admitted to the Bachelor of Veterinary Medicine degree based on Recognition of Prior Learning (RPL), based on procedures in the UNAM RPL Policy.

(g) Graduates with a three year BSc Degree (level 7) in a related field, with a combined average pass of 65% or higher in the final year, from a recognized and accredited institution, may be granted admission to the Bachelor of Veterinary Medicine degree programme at the discretion of the School.

(h) In addition to the above, final admission for all candidates will depend on a successful interview and pre-selection test.

Additional Selection Criteria

Meeting the minimum admission requirements does not necessarily ensure admission. Admission is based on the number of places available and is awarded on the basis of merit and other criteria, e.g. regional representation, marginalized students, students qualifying for admission to the extended Bachelor of Veterinary Medicine programme, and admission of international students, as determined by the School on a quota system.

Only candidates who have applied for Bachelor of Veterinary Medicine as first choice will be considered for selection into the programme.

Articulation Options

This qualification may serve as an entry point to the MSc degree in Veterinary Medicine, or Animal Science, which is a related qualification, or other relevant qualifications.

29. Assessment Criteria

The common rules and regulations of the University of Namibia governing evaluation of student performance shall apply. Students will be evaluated through both continuous assessment and / or examinations. Unless otherwise stated for an individual module, the continuous assessment mark for semester modules will constitute a weighting of 40% of the final mark whilst the examination will constitute a weighting of 60% of the final mark. In the case of year modules the continuous assessment mark will constitute a weighting of 60% of the final mark whilst the examination will constitute a weighting of 40% of the final mark. Students who have not attended 80% of lectures and / or practicals may not be granted admission into the examination.

Specific assessment criteria are indicated in the individual module descriptors.

In order to pass a module, a student must obtain a final mark of at least 50%, with a subminimum mark of 40% in each of the theory examination papers and a subminimum of 40% in each of the practical and / or oral examinations. For modules with theory and practical examinations, the final mark will be calculated on the basis of 60% theory and 40% practical, unless otherwise stated in the module descriptor.

30. Quality Assurance Arrangements

Monitoring of student progress will be done by regular assignments, tests, and short quizzes. All practical and clinical work is assessed using appropriate methods such as DOPS (direct observation of a procedure).

Tracer studies and employer feedback are sourced each year.

Internal and external moderation of examination papers and scripts are performed for all modules in all years, by appointed moderators in each module.

Internal and external moderation of assessment is done for all 100% CA modules.

The programme is reviewed every 6 years.

The programme will be submitted to the NQA framework.

The programme is fully accredited by the Namibian Veterinary Council for a period of 6 years.

31. Minimum requirements for re-admission into the School / Programme

31.1 A student will not be re-admitted into the **Bachelor of Veterinary Medicine programme** if she/he has not passed / attained at least:

By the end of the first year of registration

- A pass in either V3581ES (Veterinary Structure & Function I) or V3582ES (Veterinary Structure & Function II), as well as 14 additional credits.

By the end of the second year of registration

- Passed all first year modules

By the end of the third year of registration

- Passed all first year and at least 80 of year 2 credits

By the end of the fourth year of registration

- Passed all first and second year modules

By the end of the fifth year of registration

- Passed all first, second and third year modules

By the end of the sixth year of registration

- Passed all first, second, third and fourth year modules

By the end of the seventh year of registration

- Passed all first, second, third, fourth and fifth year modules

By the end of the eighth year of registration

- Passed all first, second, third, fourth, fifth and sixth year modules

All of the above is subject to a minimum of 54 credits attained per year.

31.2 Students on the **extended Bachelor of Veterinary Medicine programme**:

By the end of the first year of registration:

- Passed all semester 1 and 2 modules

Thereafter, the re-admission rules under 31.1 apply to students on the extended programme.

32. Advancement and progression rules

32.1 First Year to Second Year

To advance to the second year of the Bachelor of Veterinary Medicine programme a student must have passed all first year modules. A student who has passed both V3581ES (Veterinary Structure & Function I) **and** V3582ES (Veterinary Structure & Function II), will be allowed to register for a maximum of 48 second year credits (in addition to the failed modules) provided that:

(i) the relevant pre-requisites have been passed and

(ii) there are no time table clashes

32.2 Second Year to Third Year

To advance to the third year of the Bachelor of Veterinary Medicine programme a student must have passed all first and second year modules. A student who has passed all first year modules and V3681ES (Veterinary Structure & Function III) and at least an additional 30 second year credits, will be registered as a second year student. Such a student will be allowed to register for a maximum of 20 third year credits over the year (in addition to the failed modules) provided that:

(i) the relevant pre-requisites have been passed and

(ii) there are no time table clashes

32.3 Third Year to Fourth Year

To advance to the fourth year of the Bachelor of Veterinary Medicine programme a student must have passed all first, second and third year modules. A student who has passed all first and second year modules and passed at least 98 third year credits, will be allowed to enroll for a maximum of 40 fourth year credits over the year (in addition to the failed modules), provided that:

(i) the relevant pre-requisites have been passed and

(ii) there are no time table clashes

32.4 Fourth Year to Fifth year

To advance to the fifth year of the Bachelor of Veterinary Medicine programme a student must have passed all first, second, third and fourth year modules. A student who has passed all first, second and third year modules and passed at least 120 fourth year credits, will be allowed to enroll for a maximum of 40 fifth year credits over the year (in addition to the failed modules), provided that:

(i) the relevant pre-requisites have been passed and

(ii) there are no time table clashes

32.5 Fifth year to the Sixth and final year

To advance to the sixth and final year of the Bachelor of Veterinary Medicine programme a student must have passed all first, second, third, fourth and fifth year modules. A student will not be allowed to carry any modules over to the sixth year of study as this involves clinical rotations.

33. Requirements for Qualification Award

This qualification will be awarded to candidates credited with a minimum of 906 credits (students starting BVM I before 2023) OR a minimum of 1110 credits (students starting BVM I in 2023), and who have met all other relevant UNAM requirements.

34. Career Opportunities

Graduates of the programme will be able to:

- Establish their own private veterinary practice
- Gain employment as veterinarians/veterinary scientists in pharmaceutical companies, local industries, private companies, research and tertiary institutes
- Gain employment as state veterinarians

35. Implementation strategy

The new Bachelor of Veterinary Medicine program will roll in from year 1 to 6 in 2023.
The new Core Semester will be implemented from year 1 to 5 from 2023.
Articulation from the old to new curriculum will be streamlined by appropriate timetabling for students who have to repeat a module, which has been moved to a different year. For this reason some modules will only be offered in 2023, and are indicated as such in the curriculum.
BVM 6 remains a year of clinical rotations as required by relevant legislation.

34. Curriculum Framework: Summary Table for all Modules in the Programme

Module code	Module name	NQF Level	Credits	Contact hours per week (L / P / T)	(Co-requisites) / Pre-requisites	Compulsory (C) / Elective (E)
Year 1 Core Semester						
V3520EV	Veterinary Professional Skills I	5	2	L: 1	None	C
V3520ET	Veterinary Terminology	5	2	L: 2	None	C
V3520EM	Introduction to Microscopy	5	2	P: 3	None	C
TBC	Skills Portfolio	5	0		None	C
U3583AL	Academic Literacy I	5	8		None	C
U3583DD	Digital Literacy	5	8		None	C
U3420SE	Sustainable Environment Awareness	4	2		None	C
U3420CN	National and Global Citizenship	4	2		None	C
Total Credits Core Semester						**26**
Year 1 Semester 1						
V3581ES	Veterinary Structure & Function I	5	40	L: 14 P: 9 (23 integrated)	(V3520EV Veterinary Terminology) (V3520EM Introduction to Microscopy)	C
V3503EB	Veterinary Biochemistry	5	7	L: 2 P: 1.5	None	C
Total Credits Semester 1						**47**

Year 1 Semester 2						
V3582ES	Veterinary Structure & Function II	5	40	L: 14 P: 9 (23 integrated)	(V3520ET Veterinary Terminology) (V3520EM Introduction to Microscopy) (V3581ES Veterinary Structure & Function I)	C
V3503EB	Veterinary Biochemistry	5	7	L: 2 P: 1.5	None	C
Total Credits Semester 2						**47**
Total credits YEAR 1						**120**

Module code	Module name	NQF Level	Credits	Contact hours per week (L / P / T)	(Co-requisites) / Pre-requisites	Compulsory (C) / Elective (E)
Year 2 Core Semester						
V3610EV	Veterinary Professional Skills II	6	1	L: 1	None	C
V3620EF	Animal Production Farm Visits	6	2	7 integrated	None	C
V3660EP	Pasture Science	6	6	L: 4 P: 2	V3581ES Veterinary Structure & Function I V3582ES Veterinary Structure & Function II	C
V3660EM	Veterinary Microbiology I	6	6	L: 4 P: 1.5	None	C
U3683AL	Academic Literacy II	6	8		None	C
U3420RT	Entrepreneurship	4	2		None	C
Total Credits Core Semester						**25**
Year 2 Semester 1						
V3681ES	Veterinary Structure & Function III	6	35	L: 6 (8 2023 only*) P: 6 (12 integrated) (14 integrated 2023 only*)	V3520ET Veterinary Terminology V3520EM Introduction to Microscopy V3581ES Veterinary Structure & Function I V3582ES Veterinary Structure & Function II	C
V3603EP	Animal Production	6	8	L: 2 P: 0.7	(V3620EF Animal Production Farm Visits)	C

					V3581ES Veterinary Structure & Function I V3582ES Veterinary Structure & Function II	
V3611EM	Veterinary Microbiology II	6	15	L: 4 P: 1.5	(V3660EM Veterinary Microbiology I)	C
V3601EE	Animal Ethology	6	8	L: 2 P: 1.5	V3581ES Veterinary Structure & Function I V3582ES Veterinary Structure & Function II	C
V3621EG	Veterinary Genetics	6	8	L: 2 P: 0.7	None	C
V3651AP	Veterinary Parasitology I (2023 only)	6	15	L: 4 P: 1.5	V3503EB Veterinary Biochemistry	C
Total Credits Semester 1						**74 (89*)**
Year 2 Semester 2						
V3602AI	Veterinary Immunology & Vaccinology	6	8	L: 2 P: 1.5	(V3660EM Veterinary Microbiology I) (V3611EM Veterinary Microbiology II)	C
V3603EP	Animal Production	6	8	L: 2 P: 0.7	(V3620EF Animal Production Farm Visits) V3581ES Veterinary Structure & Function I V3582ES Veterinary Structure & Function II	C
V3612EN	Animal Nutrition	6	15	L: 4 P: 1.5	(V3660EP Pasture Science) (V3681ES Veterinary Structure & Function III)	C

					V3581ES Veterinary Structure & Function I V3582ES Veterinary Structure & Function II V3503EB Veterinary Biochemistry	
V3622EW	Animal Welfare	6	8	L: 2 P: 1.5	(V3681ES Veterinary Structure & Function III) (V3601EE Animal Ethology) V3581ES Veterinary Structure & Function I V3582ES Veterinary Structure & Function II	C
V3632EB	Biometry	6	15	L: 4 T: 1.5	None	C
V3642EM	Molecular Biology	6	8	L: 2 P: 1.5	(V3621EG Veterinary Genetics)	C
V3682ES	Veterinary Structure & Function IV (2023 only)	6	32	L: 3 P: 6 (9 integrated)	(V3681ES Veterinary Structure & Function III) V3520ET Veterinary Terminology V3520EM Introduction to Microscopy V3581ES Veterinary Structure & Function I V3582ES Veterinary Structure & Function II	C
V3652AP	Veterinary Parasitology II (2023 only)	6	15	L: 4 P: 1.5	V3503EB Veterinary Biochemistry	C
Total Credits Semester 2						**62 (109*)**
Total credits YEAR 2						**161 (223*)**

Module code	Module name	NQF Level	Credits	Contact hours per week (L / P / T)	(Co-requisites) / Pre-requisites	Compulsory (C) / Elective (E)
Year 3 Core Semester						
V3750PF	Fish and Bee Medicine	7	5	5.8 integrated	V3660EM Veterinary Microbiology I V3611EM Veterinary Microbiology II	C
V3710EV	Veterinary Professional Skills III	7	1	L: 1	None	C
V3740AE	Ethno-Veterinary Medicine	7	4	L: 2 P: 1.5	None	C
V3790CC	Clinical diagnostics	7	9	L: 6 P: 6	V3681ES Veterinary Structure & Function III V3682ES Veterinary Structure & Function IV (2024 only) V3503EB Veterinary Biochemistry V3601EE Animal Ethology V3622EW Animal Welfare V3602AI Veterinary Immunology & Vaccinology	C
V3720AJ	Introduction to Jurisprudence	7	2	L: 1	None	C
V3750AT	Veterinary Toxicology I	7	5	5.8 integrated	V3681ES Veterinary Structure & Function III V3682ES Veterinary Structure & Function IV (2024 only)	C
Total Credits Core Semester						**26**
Year 3 Semester 1						

V3711AI	Infectious Diseases I	7	17	L: 4 P: 1.5	V3660EM Veterinary Microbiology I V3611EM Veterinary Microbiology II	C
V3731AP	Veterinary Parasitology I	7	17	L: 4 P: 1.5	V3681ES Veterinary Structure & Function III V3682ES Veterinary Structure & Function IV (2024 only) V3503EB Veterinary Biochemistry	C
V3703AD	Veterinary Pharmacology	7	9	L: 2 P/T: 1.5	(V3790CC Clinical Diagnostics) V3503EB Veterinary Biochemistry V3681ES Veterinary Structure & Function III V3682ES Veterinary Structure & Function IV (2024 only)	C
V3723AG	General Pathology	7	9	L: 2 P/T: 1.5	V3681ES Veterinary Structure & Function III V3682ES Veterinary Structure & Function IV (2024 only) V3602AI Veterinary Immunology & Vaccinology	C
V3701CS	Veterinary General Surgery	7	9	L: 2 P/T: 1.5	V3681ES Veterinary Structure & Function III V3682ES Veterinary Structure & Function IV (2024 only)	C
V3743AT	Veterinary Toxicology II	7	8	L: 2	(V3750AT Veterinary Toxicology I) V3503EB Veterinary Biochemistry V3681ES Veterinary Structure & Function III	C

					V3682ES Veterinary Structure & Function IV (2024 only)	
V3741PH	Herd Health Management & Economics I (2023 only)	7	9	L: 2 P: 1.5	V3603EP Animal Production V3602AI Veterinary Immunology & Vaccinology	C
Total Credits Semester 1						**69 (78*)**
Year 3 Semester 2						
V3732AP	Veterinary Parasitology II	7	17	L: 4 P: 1.5	(V3731AP Veterinary Parasitology I) V3681ES Veterinary Structure & Function III V3682ES Veterinary Structure & Function IV (2024 only) V3503EB Veterinary Biochemistry	C
V3723AG	General Pathology	7	9	L: 2 P/T: 1.5	V3681ES Veterinary Structure & Function III V3682ES Veterinary Structure & Function IV (2024 only) V3602AI Veterinary Immunology & Vaccinology	C
V3703AD	Veterinary Pharmacology	7	9	L: 2 P/T: 1.5	(V3790CC Clinical Diagnostics) V3503EB Veterinary Biochemistry V3681ES Veterinary Structure & Function III V3682ES Veterinary Structure & Function IV (2024 only)	C
V3712AI	Infectious Diseases II	7	17	L: 4 P: 1.5	(V3711AI Infectious Diseases I) V3660EM Veterinary Microbiology I	C

					V3611EM Veterinary Microbiology II	
V3702CA	Veterinary Anaesthesiology	7	9	L: 2 P: 1.5	V3681ES Veterinary Structure & Function III V3682ES Veterinary Structure & Function IV (2024 only)	C
V3722CD	Veterinary Diagnostic Imaging	7	9	L: 2 P: 1.5	(V3790CC Clinical Diagnostics) V3681ES Veterinary Structure & Function III V3682ES Veterinary Structure & Function IV (2024 only)	C
V3743AT	Veterinary Toxicology II	7	8	L: 2	(V3750AT Veterinary Toxicology I) V3503EB Veterinary Biochemistry V3681ES Veterinary Structure & Function III V3682ES Veterinary Structure & Function IV (2024 only)	C
V3742PH	Herd Health Management & Economics II (2023 only)	7	9	L: 2 P: 1.5	V3603EP Animal Production V3602AI Veterinary Immunology & Vaccinology	C
Total Credits Semester 2						**78 (87*)**
Total credits YEAR 3						**173 (191*)**

Module code	Module name	NQF Level	Credits	Contact hours per week (L / P / T)	(Co-requisites) / Pre-requisites	Compulsory (C) / Elective (E)
Year 4 Core Semester						
V3830EV	Veterinary Professional Skills IV	8	3	L: 4	None	C
V3810AL	Field Practical Training: Laboratory	8	1	2 integrated	V3660EM Veterinary Microbiology I V3611EM Veterinary Microbiology II V3731AP Veterinary Parasitology I V3732AP Veterinary Parasitology II V3743AT Veterinary Toxicology II V3723AG General Pathology V3642EM Molecular Biology	C
V3890CC	Clinical Pathology	8	9	L: 3 P: 6	V3790CC Clinical Diagnostics V3731AP Veterinary Parasitology I V3732AP Veterinary Parasitology II	C
V3810CD	Applied Diagnostic Imaging	8	1	P: 1.5	V3722CD Veterinary Diagnostic Imaging	C
V3810CS	Applied General Surgery	8	1	P: 1.5	V3701CS Veterinary General Surgery	C
V3830PW	Wildlife Clinical Studies I	8	3	L: 2 P: 1.5	V3711AI Infectious Diseases I V3712AI Infectious Diseases II	C
V3830PT	Theriogenology I	8	3	L: 2 P: 1	V3612EN Animal Nutrition V3603EP Animal Production V3711AI Infectious Diseases I V3712AI Infectious Diseases II	C

					V3790CC Clinical Diagnostics V3703AD Veterinary Pharmacology V3723AG General Pathology V3701CS General Surgery	
V3830PP	Production Animal Clinical Studies I	8	3	L: 2 P: 1.5	V3743AT Veterinary Toxicology II V3711AI Infectious Diseases I V3712AI Infectious Diseases II V3790CC Clinical Diagnostics V3703AD Veterinary Pharmacology V3723AG General Pathology V3701CS General Surgery V3731AP Veterinary Parasitology I V3732AP Veterinary Parasitology II	C
Total Credits Core Semester						**24**
Year 4 Semester 1						
V3803AS	Systemic Pathology	8	10	L: 2 P: 1.5	V3723AG General Pathology	C
V3811AV	Veterinary Public Health I	8	19	L: 3 P: 1.5	V3731AP Veterinary Parasitology I V3732AP Veterinary Parasitology II V3711AI Infectious Diseases I V3712AI Infectious Diseases II V3723AG General Pathology	C
V3813CC	Companion Animal Clinical Studies I	8	20	L: 3 P: 3	(V3890CC Clinical Pathology) V3731AP Veterinary Parasitology I	C

					V3732AP Veterinary Parasitology II V3703AD Veterinary Pharmacology V3743AT Veterinary Toxicology II V3711AI Infectious Diseases I V3712AI Infectious Diseases II V3701CS Veterinary General Surgery V3722CD Veterinary Diagnostic Imaging V3790CC Clinical Diagnostics	
V3831PP	Production Animal Clinical Studies II	8	19	L: 3 P: 1.5	(V3830PP Production Animal Clinical Studies I) (V3890CC Clinical Pathology) V3743AT Veterinary Toxicology II V3711AI Infectious Diseases I V3712AI Infectious Diseases II V3790CC Clinical Diagnostics V3703AD Veterinary Pharmacology V372EAG General Pathology V3701CS General Surgery V3731AP Veterinary Parasitology I V3732AP Veterinary Parasitology II	C
V3823PT	Theriogenology II	8	10	L: 2 P: 1.5	(V3830PT Theriogenology I) V3711AI Infectious Diseases I V3712AI Infectious Diseases II V3790CC Clinical Diagnostics V3703AD Veterinary Pharmacology V3723AG General Pathology	C

					V3701CS General Surgery	
V3863PW	Wildlife Clinical Studies II	8	10	L: 2 P: 1.5	(V3830PW Wildlife Clinical Studies I) V3711AI Infectious Diseases I V3712AI Infectious Diseases II V3790CC Clinical Diagnostics V3703AD Veterinary Pharmacology V3723AG General Pathology V3701CS General Surgery V3731AP Veterinary Parasitology I V3732AP Veterinary Parasitology II	C
V3843AE	Veterinary Epidemiology	8	10	L: 2 T: 1.5	V3632EB Biometry V3711AI Infectious Diseases I V3712AI Infectious Diseases II	C
Total Credits Semester 1						**98**
Year 4 Semester 2						
V3812AV	Veterinary Public Health II	8	19	L: 3 P: 1.5	(V3811AV Veterinary Public Health I) V3731AP Veterinary Parasitology I V3732AP Veterinary Parasitology II V3711AI Infectious Diseases I VM3712AI Infectious Diseases II V3723AG General Pathology	C
V3803AS	Systemic Pathology	8	10	L: 2 P: 1.5	V3723AG General Pathology	C

V3843AE	Veterinary Epidemiology	8	10	L: 2 P: 1.5	V3632EB Biometry V3711AI Infectious Diseases I V3712AI Infectious Diseases II	C
V3813CC	Companion Animal Clinical Studies I	8	20	L: 3 P: 3	(V3890CC Clinical Pathology) V3731AP Veterinary Parasitology I V3732AP Veterinary Parasitology II V3703AD Veterinary Pharmacology V3743AT Veterinary Toxicology II V3711AI Infectious Diseases I V3712AI Infectious Diseases II V3701CS Veterinary General Surgery V3722CD Veterinary Diagnostic Imaging V3790CC Clinical Diagnostics	C
V3823PT	Theriogenology II	8	10	L: 2 P: 1.5	(V3830PT Theriogenology I) V3711AI Infectious Diseases I V3712AI Infectious Diseases II V3790CC Clinical Diagnostics V3703AD Veterinary Pharmacology V3723AG General Pathology V3701CS General Surgery	C
V3832PP	Production Animal Clinical Studies III	8	19	L: 3 P: 1.5	(V3840PP Production Animal Studies I) (V3831PP Production Animal Studies II) (V3890 Clinical Pathology) V3743 Veterinary Toxicology II V3711AI Infectious Diseases I V3712AI Infectious Diseases II	C

					V3790CC Clinical Diagnostics V3703AD Veterinary Pharmacology V3723AG General Pathology V3701CS General Surgery	
V3863PW	Wildlife Clinical Studies II	8	10	L: 2 P: 1.5	(V3830PW Wildlife Clinical Studies I) V3711AI Infectious Diseases I V3712AI Infectious Diseases II V3790CC Clinical Diagnostics V3703AD Veterinary Pharmacology V3723AG General Pathology V3701CS General Surgery V3731AP Veterinary Parasitology I V3732AP Veterinary Parasitology II	C
Total Credits Semester 2						**98**
Total credits YEAR 4						**220**

Module code	Module name	NQF Level	Credits	Contact hours per week (L / P / T)	(Co-requisites) / Pre-requisites	Compulsory (C) / Elective (E)
Year 5 Core Semester						
V3840AR	Research Methodology	8	4	L: 1 T: 2	V3843AE Veterinary Epidemiology	C
V3820AO	One Health	8	2	L: 2	V3811AV Veterinary Public Health I V3812AV Veterinary Public Health II	C
V3830PR	Theriogenology III	8	3	L: 2 P: 1.5	V3830PT Theriogenology I V3823PT Theriogenology II	C
V3860CB	Companion Animal Behavioural Medicine	8	6	L: 2 P: 3	V3703AD Veterinary Pharmacology V3790CC Clinical Diagnostics	C
V3830ES	Veterinary professional skills V	8	3	L: 3	None	C
V3830CE	Cage Bird and Exotic Animal Clinical Studies	8	3	L: 1 P: 1.5	V3703AD Veterinary Pharmacology V3743AT Veterinary Toxicology II V3722CD Veterinary Diagnostic Imaging V3702CA Veterinary Anaesthesiology V3701CS Veterinary General Surgery V3790CC Clinical Diagnostics	C
V3830CH	Introduction to Equine Clinical Studies	8	3	L: 1 P: 1.5	V3790CC Clinical Diagnostics	C
V3820AJ	Introduction to Jurisprudence (2023 and 2024 only)	8	2	L: 1	None	C

Total Credits Core Semester						**24 (26*)**
Year 5 Semester 1						
V3883AR	Research Project	8	15	L: 2	(V3840AR Research Methodology) V3843AE Veterinary Epidemiology	C
V3833CC	Companion Animal Clinical Studies II	8	20	L: 4 P: 3	V3813CC Companion Animal Clinical Studies I	C
V3843PT	Theriogenology IV	8	10	L: 2 P: 1.5	(V3830PR Theriogenology III) V3830PT Theriogenology I V3823PT Theriogenology II	C
V3851PP	Production Animal Clinical Studies IV	8	19	L: 4 P: 1.5	(V3872PP Production Animal Clinical Studies V) V3830PP Production Animal Clinical Studies I V3831PP Production Animal Clinical Studies II V3832PP Production Animal Clinical Studies III	C
V3801PW	Wildlife Clinical Studies III	8	10	L: 2 P: 1.5	V3830PW Wildlife Clinical Studies I V3863PW Wildlife Clinical Studies II	C
V3823CH	Equine Clinical Studies	8	10	L: 2 P: 1.5	(V3830CH Introduction to Equine Clinical Studies) V3731AP Veterinary Parasitology I V3732AP Veterinary Parasitology II V3703AD Veterinary Pharmacology	C

					V3743AT Veterinary Toxicology II V3701CS Veterinary General Surgery V3722CD Veterinary Diagnostic Imaging V3790CC Clinical Diagnostics V3803AS Systemic Pathology	
V3821PH	Herd Health Management & Economics I	8	10	L: 2 P: 1.5	V3601EE Animal Ethology V3622EW Animal Welfare V3731AP Veterinary Parasitology I V3832AP Veterinary Parasitology II V3602AI Veterinary Immunology & Vaccinology V3603EP Animal Production	C
Total Credits Semester 1						**94**
Year 5 Semester 2						
V3883AR	Research Project	8	15	L: 2	(V3840AR Research Methodology) V3843AE Veterinary Epidemiology	C
V3833CC	Companion Animal Clinical Studies II	8	20	L: 4 P: 3	V3813CC Companion Animal Clinical Studies I	C
V3843PT	Theriogenology IV	8	10	L: 2 P: 1.5	(V3830PR Theriogenology III) V3830PT Theriogenology I V3823PT Theriogenology II	C
V3872PP	Production Animal Clinical Studies V	8	19	L: 4 P: 1.5	(V3851PP Production Animal Clinical Studies IV)	C

					(V3821PH Herd Health Management & Economics I) V3830PP Production Animal Clinical Studies I V3831PP Production Animal Clinical Studies II V3832PP Production Animal Clinical Studies III	
V3823CH	Equine Clinical Studies	8	10	L: 2 P: 1.5	(V3830CH Introduction to Equine Clinical Studies) V3731AP Veterinary Parasitology I V3732AP Veterinary Parasitology II V3703AD Veterinary Pharmacology V3743AT Veterinary Toxicology II V3701CS Veterinary General Surgery V3722CD Veterinary Diagnostic Imaging V3790CC Clinical Diagnostics	C
V3822PH	Herd Health Management & Economics II	8	10	L: 2 P: 1.5	(V3821PH Herd Health Management & Economics I) V3601EE Animal Ethology V3622EW Animal Welfare V3731AP Veterinary Parasitology I V3732AP Veterinary Parasitology II V3602AI Veterinary Immunology & Vaccinology V3603EP Animal Production	C

V3842AJ	Veterinary Legislation	8	9	L: 2	V3720AJ Introduction to Jurisprudence V3820AJ Introduction to Jurisprudence (2023 and 2024 only)	C
Total Credits Semester 2						**93**
Total credits YEAR 5						**211 (213*)**

Module code	Module name	NQF Level	Credits	Contact hours per week (L / P / T)	(Co-requisites) / Pre-requisites	Compulsory (C) / Elective (E)
Year 6						
V3883FY	**CLINICAL ROTATION**	8	225	P/T: 35 hours Work Integrated Learning per week for 48 weeks	BVM V	C
	Theriogenology (Equine, Bovine, Small stock and Canines)					C
	Cage Birds and Exotic Animal Clinic					C
	Veterinary Public Health (Abattoir, Food Safety Systems)					C
	Production Animal Clinic and Ambulatory Clinic					C
	Small Animal Surgery					C
	Cadaver Surgery					C
	Anaesthesiology and Pharmacology					C
	Equine Clinic					C
	Epidemiology					C
	Pathology and Parasitology					C
	Private Veterinary Practice					C
	State Veterinary Practice					C
	Companion Animal Clinic					C
	Mobile Animal Clinic					C
	Medicine Online					C

	Diagnostic Imaging (Radiography, Ultrasonography)					C
	Animal Welfare Clinic					C
	Isolation Clinic					C
	Outpatients Clinic					C
	Elective Rotation (Onderstepoort VAH, Wildlife, Mobile Animal Clinic, Equine, Student preference)					E
	Revisit (Repeat any of above)					C
	Veterinary Association of Namibia Congress					C
Total credits YEAR 6					**225**	
Total Bachelor of Veterinary Medicine credits					**1110**	

.

Module Title: VETERINARY PROFESSIONAL SKILLS I	
Module Code	V3520EV
NQF Level	5
Notional Hours	20
Contact hours	Lectures: 1 x 1hr lecture / week for 6 weeks
Additional learning requirements	None
NQF Credits	2
(Co-requisites) **Prerequisite**	None
Compulsory/Elective	Compulsory
Semester Offered	CS1

Module Purpose

The purpose of this module is to assist the first-year veterinary student to settle into the first year of study by providing certain life skills required. The emphasis will be on developing the following skills: Managing the transition from school life to university life with emphasis on taking responsibility for your life, finances, time management and studies and free time.

Overarching Learning Outcome

To develop life skills specific to a future career as a Veterinary Professional.

Specific Learning Outcomes

On completing the module students should be able to:

1. Determine a personal budget for the year, open a bank account, entering into contracts
2. Use their time effectively, developing a first approach to finding a balance between studies and personal life
3. Manage conflict constructively and deal with disagreement
4. Identify and recommend for themselves a nutritious diet and lead a healthy lifestyle
5. Think critically, proofread their work in order to deliver work that meets the stated requirements
6. Manage personal stress and develop resilience

Module Content

Budgeting: money management
Work-life balance: managing your personal affairs; saying no
Organisational skills: coping with high work volumes
Presentation skills
Conflict management strategies
Dealing with difficult people / students / lecturers
Time management
Personal boundary management
Healthy habits: meal management
Asking for help
Critical thinking and problem-solving
Attention to detail: check your work before submission
Effective stress management and resilience

Learning and Teaching Strategies/Activities

Blended teaching model through integrated lectures, real life simulations and case studies

Student Assessment Strategies

Continuous Assessment: 1 assignment for final CA mark (e.g. written assignment, group assignment, role-play and / or presentation).
Continuous participation assessment during compulsory lecture attendance.

Learning and Teaching Enhancement Strategies

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

Learning resources:

1. All required resources will be supplied to students in hard and/or soft copy, updated annually

Module Title: VETERINARY TERMINOLOGY	
Module Code	V3520ET
NQF Level	5
Notional Hours	20
Contact hours	Lectures: 2 x 1hr lectures / week for 6 weeks
Additional learning requirements	None
NQF Credits	2
(Co-requisites) **Prerequisite**	None
Compulsory/Elective	Compulsory
Semester Offered	CS1
Module Purpose	
The purpose of this module is to build the student's medical and veterinary vocabulary on the terms specific to the Bachelor of Veterinary Medicine course.	
Overarching Learning Outcome	
Apply veterinary terminology appropriately.	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Identify and recognize the parts of a medical term 2. Define commonly used prefixes, combining forms, and suffixes 3. Analyze and understand basic medical terms 4. Identify and recognize body planes, positional terms, directional terms and body cavities 5. Identify terms used to describe tissues and glands 6. Define terms related to body cavities and structure 7. Recognize, correctly spell, define and pronounce medical terms related to pathology and procedures 8. Identify body systems by their components and combining forms 9. Identify prefixes that assign numeric value	

Module Content

How medical terms are formed
Terms related to body systems, pathology and procedures
Directional terms
Body planes
Positional terms

Learning and Teaching Strategies/Activities

Through lectures and assignments.

Student Assessment Strategies

Continuous Assessment: Minimum 2 assignments and 1 theory test for final CA mark.

Learning and Teaching Enhancement Strategies

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

Learning resources:

1. Romich (2000). An Illustrated Guide to Veterinary Medical Terminology, Oxford University Press
2. Blood (2012). Saunders Comprehensive Veterinary Dictionary, Saunders / Elsevier
3. Christenson (2009). Veterinary medical terminology, Saunders / Elsevier
4. Boden (2015). Black's veterinary dictionary, London Bloomsbury

Module Title: INTRODUCTION TO MICROSCOPY	
Module Code	V3520EM
NQF Level	5
Notional Hours	20
Contact hours	Lectures and Practical: Integrated 1 x 3hr practical / week for 6 weeks
Additional learning requirements	None
NQF Credits	2
(Co-requisites) **Prerequisite**	None
Compulsory/Elective	Compulsory
Semester Offered	CS1
Module Purpose	
The purpose of this module is to introduce the student to microscopy and to provide practical experience in working with a compound light microscope.	
Overarching Learning Outcome	
Demonstrate microscopy technique and discuss sample preparation.	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Identify the parts of a compound light microscope 2. Explain the function of various parts of the compound light microscope 3. Calculate magnification on a compound light microscope 4. Place a slide on, and remove a slide from the compound light microscope stage. Clean the microscope. 5. Locate a specimen on a slide, focus clearly and adjust the light intensity at various magnifications on a compound light microscope 6. Identify and sketch cells observed with a compound light microscope on a prepared slide 7. Define terms used in microscopy 8. List the various microscopes or microscopy techniques and their uses 9. Discuss tissue collection and the steps in tissue processing for histology	

Module Content

Principles of microscopy: various microscopes; microscopy techniques and practical use of microscopes

Tissue collection and tissue processing for histology

Learning and Teaching Strategies/Activities

Blended teaching model through integrated lectures and practicals.

Student Assessment Strategies

Continuous Assessment: Minimum 3 practical assessments and 1 theory assessment for final CA mark.

Learning and Teaching Enhancement Strategies

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

Learning resources:

1. Bacha, WJ 2012, Color atlas of veterinary histology, Wiley-Blackwell.
2. Junqueira's basic histology: text and atlas 2010, McGraw-Hill Medical.

Module Title: VETERINARY STRUCTURE & FUNCTION I	
Module Code	V3581ES
NQF Level	5
Notional Hours	400
Contact hours	Lectures: 14x 1hr lectures / week for 13 weeks Practical: 3x 3hr practical / week for 13 weeks 23hrs integrated lectures, practicals and tutorials / week for 13 weeks
Additional learning requirements	None
NQF Credits	40
(Co-requisites) **Prerequisite**	(Veterinary Terminology) (Introduction to Microscopy)
Compulsory/Elective	Compulsory
Semester Offered	1

Module Purpose

The purpose of this module is 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 musculoskeletal and nervous systems, and how they two systems work together. 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. Palpation and images 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 images.

Overarching Learning Outcome

Demonstrate knowledge of musculoskeletal and neurological anatomy, physiology, embryology and histology of domestic animals.

Specific Learning Outcomes

On completing the module students should be able to:

1. Explain the general concept of structure as comprising of developmental, microscopic and macroscopic anatomy and emphasise its relationship to function

as a theme that will recur throughout the instruction of Veterinary Structure and function
2. Explain the concepts of cell physiology, homeostasis, regulatory mechanisms including set point, negative and positive feedback loops and compensatory responses.
3. Describe the general physiological concepts of the animal body paying particular attention to the musculoskeletal and nervous systems and their importance to the integrative functions of the animal body.
4. State the relationship between structure and function in domestic animals.
5. Explain how the organism is composed of cells, organs and organ systems.
6. Dissect clinically relevant topographic anatomical features of the musculoskeletal and nervous systems of domestic animals.
7. Identify clinically relevant topographic anatomical features of domestic animal the musculoskeletal and nervous systems in demonstration specimens.
8. Identify clinically relevant topographic anatomical features of domestic animals of the musculoskeletal using palpation.
9. Demonstrate understanding of topographic anatomy in application of local and regional anaesthesia (regional nerve blocks) in domestic animals
10. Demonstrate understanding of topographic anatomy as applied intramuscular injection therapy.
11. Demonstrate applications of topographic anatomy in clinical examination of the musculoskeletal system of domestic animals
12. Explain the structure and function of bone, cartilage, joints and synovial fluid – including bone formation, bone remodeling, bone growth and joint movement
13. Describe the function and homeostasis of various macro- and trace minerals related to bone physiology
14. Describe the structural and functional organization of the nervous system – including the central and peripheral nervous systems and the autonomic nervous system
15. Discuss intracellular and extracellular communication systems
16. Explain the structure and function of skeletal muscle – including excitation-contraction coupling, sliding filament mechanism, muscle force generation, isometric and isotonic contractions
17. Explain the structure and functions of smooth muscles – including excitation-contraction coupling

Module Content

Gross anatomy:

Definition of anatomy and its relationship to function (physiology).
General and applied osteology, arthrology and syndesmology.
Bones and muscles of the head, neck, trunk, fore and hindlimbs.
Nervous system: general introduction to the nervous system; autonomic nervous system; central and peripheral nervous systems. Central nervous system: telencephalon and diencephalon; brainstem (mesencephalon, pons, medulla); cerebellum. Cranial nerves: names, courses and distribution of cranial nerves and specific dysfunction related to lesions in cranial nerves. Spinal cord: Peripheral nervous system spinal nerves. The brachial and

lumbosacral plexuses: names, courses and distribution of named nerves of the brachial plexus. Names, courses and distribution of lumbosacral plexus nerves.

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; homeostasis; body system integration.

Bone, joints and synovial fluid: bone formation; bone growth; bone remodeling

Nervous system: central and peripheral nervous systems; the autonomic nervous system; somatic nervous system; cerebro-spinal fluid; neurophysiology.

Muscle: muscles; types of muscles; sliding filament theory of muscle contraction; excitation-contraction coupling; locomotion; movement coordination.

Embryology:

Developmental anatomy **definition** and introduction to **terms**.

Early embryonic development: 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:

Trunk and limbs

Neuromuscular system; including central and peripheral nervous systems

Histology:

Definition and etymology of microscopic anatomy.

Basic tissues: epithelial tissue; connective tissue; nervous tissue; muscle tissue.

Cerebrum, cerebellum, peripheral ganglia nerve trunk and peripheral nerve.

Learning and Teaching Strategies/Activities

Blended teaching model through integrated lectures, dissections, presentations, case studies, illustrations, microscopy practicals, live animal practicals, written assignments, group work, class discussions.

Student Assessment Strategies

Continuous Assessment: Minimum 4 theory assessments (one in each section) and at least 3 marked practical assessments (one in each: Anatomy, Histology and Physiology).
CA calculation: Anatomy 50%; Physiology 20%; Histology 20%; Embryology 10%

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

Learning and Teaching Enhancement Strategies

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

Prescribed Learning Resources

Physiology

Prescribed textbooks:

1. Reece, WO, Erickson, HH, Goff, JP & Uemura, EE 2015, Dukes' physiology of domestic animals, 13th edn, John Wiley & Sons.
2. Klein, BG 2013, Cunningham's textbook of veterinary physiology, 5th edn, Elsevier Saunders.

Additional resources:

1. Akers, RM & Denbow DM 2013, Anatomy and physiology of domestic animals, Blackwell Publishing.
2. Aspinall, V 2015, Introduction to veterinary anatomy and physiology textbook, Elsevier
3. Hall, JE & Guyton A 2016, Guyton and Hall textbook of medical physiology; 13th edn, Elsevier
4. Reece, WO 2015, Functional anatomy and physiology of domestic animals, 4th edn, John Wiley & Sons.
5. Frandson, RD 2003, Anatomy and Physiology of Farm Animals, 7th edn, Wiley-Blackwell

Anatomy

Prescribed textbooks:

1. Evans, HE 2010, Guide to the dissection of the dog, Saunders/Elsevier.
2. König, HE, Liebich, HG and Bragulla, H 2014, Veterinary anatomy of domestic mammal: textbook and colour atlas, Schattauer.

Additional resources:

1. Dyce, K and Wensing, W 2010, Textbook of Veterinary Anatomy, Saunders/Elsevier.
2. Aspinall, V 2015, Introduction to veterinary anatomy and physiology textbook, Elsevier.
3. Barone, R 2009, Anatomie comparée des mammiféres domestiques, Vigot.
4. De Lahunta, A., Glass, E. N., & Kent, M. (2014). Veterinary Neuroanatomy and Clinical Neurology-E-Book. Elsevier Health Sciences.
5. DelaGunta and Habel, RE 1986, Applied Veterinary Anatomy, Saunders.
6. Diesem, C., & Getty, R. (1975). Sisson and Grossman's The Anatomy of Domestic Animals. WB Saunders Company

Histology

Prescribed textbooks:

1. Bacha, WJ 2012, Color atlas of veterinary histology, Wiley-Blackwell.
2. Junqueira's basic histology: text and atlas 2010, McGraw-Hill Medical.

Additional resources:

1. Eurell, JA, and Frappier, BL 2013, Dellmann's textbook of veterinary histology. John Wiley & Sons.
2. Garg, K 2014, Textbook of histology: colour atlas, CBS.
3. Kerr, JB 2010, Functional histology, Mosby/Elsevier.

Embryology

Prescribed textbooks:

1. Hyttel, P, Sinowatz, F, Vejlsted, M and Betteridge, K 2010, Essentials of domestic animal embryology, Saunders/Elsevier.
2. McGeady, TA, Quinn, PJ, FitzPatrick, ES, Ryan, MT, Kilroy, D, & Lonergan, P 2006, Veterinary embryology, Blackwell Pub.

Additional resources:

1. Carlson, BM 2009, Human embryology and developmental biology, Mosby/Elsevier.
2. Sadler, T. W 2015, Langman's medical embryology, Wolters Kluwer.

Module Title: VETERINARY BIOCHEMISTRY	
Module Code	V3503EB
NQF Level	5
Notional Hours	140
Contact hours	Lectures: 2x 1hr lectures / week for 13 weeks per semester Practicals: 1 x 3hr practical / alternate week for 13 weeks per semester
Additional learning requirements	None
NQF Credits	14
(Co-requisites) **Prerequisite**	None
Compulsory/Elective	Compulsory
Semester Offered	1 and 2 (year module)

Module Purpose

The purpose of this module is to acquaint students with principles of Biochemistry in the context of veterinary medicine.

Overarching Learning Outcome

Discuss applicable concepts in Biochemistry relevant to Veterinary Medicine.

Specific Learning Outcomes

On completing the module students should be able to:

1. Discuss the following: the properties of water; the concepts of hydrogen bonding; colligative properties of solutions; ionization; ion product; pH; acids and bases; titration and buffers
2. Discuss the structures and properties of the major classes of biomolecules and their biological functions.
3. Discuss protein structure and function, including basic building blocks of proteins, Oxygen Transporting Proteins and enzymes
4. Discuss different classes of carbohydrates.
5. Discuss Carbohydrate Metabolism with regards to Glycolysis, Citric Acid Cycle, Oxidative Phosphorylation, Pentose Phosphate Pathway, Cori Cycle, Gluconeogenesis, and Glycogen Metabolism
6. Discuss metabolism and apply the laws of thermodynamics as applies to energy balance and energy utilization
7. Discuss the Urea Cycle
8. Discuss Fatty Acid Metabolism
9. Discuss Lipid classification
10. Discuss Nucleic acids

Module Content

Introduction to Biochemistry: Properties of water; the concepts of hydrogen bonding; colligative properties of solutions; ionization; ion product; pH; acids and bases; titration and buffers
Structures and properties of the major classes of biomolecules and their biological functions: Protein structure and function: Basic building block of proteins, their chemistry and reactions; Oxygen Transporting Proteins: Myoglobin; Hemoglobin; Relationship Between Structure and Function
Enzymes: Kinetics; Mechanisms and Regulation; Different classes of carbohydrates; Lipid classification: compounds which are non-polymeric; cell membranes and its properties; fatty acids, triglycerides, phospholipids and steroids; Nucleic acids: Chemistry of purines and pyrimidines; nucleosides and nucleotides; nucleic acids namely DNA, RNA, their structure, topology and function
Metabolism and the laws of thermodynamics: Energy Balance and Energy Utilization; Carbohydrate Metabolism: Glycolysis; Citric Acid Cycle; Oxidative Phosphorylation; Pentose Phosphate Pathway; Cori Cycle; Gluconeogenesis and Glycogen Metabolism; Fatty Acid Metabolism; degradation and synthesis; Urea cycle

Learning and Teaching Strategies/Activities
Blended teaching model through lectures, tutorials and laboratory practicals

Student Assessment Strategies

Continuous Assessment: Minimum 6 theory assessments and at least 5 practical assessments
CA calculation: 70% theory and 30% practical

Examination: 1x 3hr theory paper

Learning and Teaching Enhancement Strategies

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

Prescribed Learning Resources

Prescribed books:

1. Nelson, D.L. and Cox, M.M., 2005. Lehninger. Principles of biochemistry, 4.
2. Berg, J.M., Tymoczko, J.L. and Stryer, L., Biochemistry, International 7th edition, England.

Additional resources:

1. Fliesler, A.J. and Anderson, R.E., 1983. Chemistry and metabolism of lipids in the vertebrate retina. Progress in lipid research.
2. Voet, D., Voet, J.G. and Pratt, C.W., 2013. Fundamentals of biochemistry: life at the molecular level (No. 577.1 VOE).
3. Bello, C.S. and Guirado, J.Á.R., Biochemistry II.

Module Title: VETERINARY STRUCTURE & FUNCTION II	
Module Code	V3582ES
NQF Level	5
Notional Hours	400
Contact hours	Lectures: 14x 1hr lectures / week for 13 weeks Practical: 3x 3hr practical / week for 13 weeks 23hrs integrated lectures, practicals and tutorials / week for 13 weeks
Additional learning requirements	None
NQF Credits	40
(Co-requisites) **Prerequisite**	(Veterinary Terminology) (Introduction to Microscopy) (Veterinary Structure & Function I)
Compulsory/Elective	Compulsory
Semester Offered	2

Module Purpose

The purpose of this module is to enable students to gain an understanding of the basic and applied aspects of the structure and function of the cardiopulmonary, digestive, and urinary 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.

Overarching Learning Outcome

Demonstrate knowledge of cardiopulmonary, digestive and urinary anatomy, physiology, embryology and histology of domestic animals.

Specific Learning Outcomes

On completing the module students should be able to:

1. Dissect clinically relevant topographic anatomical features of the cardiopulmonary, digestive and urinary systems of the domestic animal.
2. Identify clinically relevant topographic anatomical features of the cardiopulmonary, digestive, and urinary systems of domestic animals in demonstration specimens.
3. Identify clinically relevant topographic anatomical features of the cardiopulmonary, digestive, and urinary systems of domestic animal using palpation, auscultation and percussion.
4. Demonstrate understanding of topographic anatomy as applied to venipuncture (intravenous injection therapy).

5. Demonstrate applications of topographic anatomy in clinical examination of the cardiopulmonary digestive and urinary systems of domestic animals.
6. Explain the structure and functions of the cardiovascular system – including the mechanical, electrical properties of cardiac muscle function and the excitation-contraction coupling in cardiac muscle.
7. Explain the reflex regulation of blood pressure.
8. Describe the normal composition of blood including the functions of each type of cell.
9. Describe the structure and functions of the respiratory system including air conduction and conditioning, olfaction, lung volumes, gas exchange, and gas transport in blood.
10. Discuss the characteristics and comparative physiology of the digestive system of domesticated animals.
11. Discuss gastro-intestinal motility, secretory functions of gastro-intestinal tract, their regulation and gastro-intestinal hormones.
12. Describe and compare absorption, metabolism and excretion of various nutrients, appetite and control of feed intake in relevant species.
13. Describe the structure and function of the urinary system including kidneys and nephrons – glomerular filtration, tubular reabsorption, tubular secretion and excretion.
14. Describe the regulation of acids and bases in the body.
15. Describe the role of the kidneys in arterial blood pressure regulation.

Module Content

Gross anatomy:

Cardiopulmonary system: External nares; nasal cavities; paranasal sinuses; nasopharynx; guttural pouches; larynx, trachea. Thorax: 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.

Digestive system: Mouth; oral vestibule; oral cavity proper; teeth (general structure and ageing); 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. Abdominal wall and abdominal topography. Liver; pancreas.

Urinary system: General gross and topographic anatomy of the kidney; ureters; urinary bladder and urethra.

Physiology:

Cardiovascular system: overview of cardiovascular function; blood: composition, properties and function of blood, blood circulation, physiology of lymph, cardiac muscle, mechanism of cardiac contraction, heart beat and cardiac cycle, regulation of blood pressure and heart activity.

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. Physiology of olfaction.
Digestive system: review of gastrointestinal tract (GIT), main functions of digestive system, physiology of taste, accessory digestive organs and glands, digestive phenomenon of monogastric and polygastric animals; regulation of the gastrointestinal tract functions.
Excretory system: organisational 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 and arterial blood pressure regulation.

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; pancreas
Respiratory system
Cardiovascular system: heart and blood vessels
Urinary system

Histology:

Cardiovascular: cardiac muscle; large, medium and small arteries; veins; venules; capillaries
Respiratory portion of the respiratory system: respiratory mucosa, olfactory mucosa, the muco-ciliiary clearance complex, the alveoli, the blood-air barrier.
Digestive system: mouth; the tongue; oral papillae; taste buds; dental pad; teeth; salivary glands; esophagus; simple stomach; rumen; reticulum; omasum; abomasum; liver; pancreas; duodenum; jejunum; ileum; caecum; colon and anal canal
Urinary system: kidney; ureters; urinary bladder and urethra

Learning and Teaching Strategies/Activities

Blended teaching model through integrated lectures, dissections, presentations, case studies, illustrations, microscopy practicals, live animal practicals, written assignments, group work, class discussions.

Student Assessment Strategies

Continuous Assessment: Minimum 4 theory assessments (one in each section) and at least 3 practical assessments (one in each: Anatomy, Histology and Physiology).
CA calculation: Anatomy 40%; Physiology 30%; Histology 20%; Embryology 10%

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

Learning and Teaching Enhancement Strategies

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

Prescribed Learning Resources

Physiology

Prescribed textbooks:

1. Reece, WO, Erickson, HH, Goff, JP & Uemura, EE 2015, Dukes' physiology of domestic animals, 13th edn, John Wiley & Sons.
2. Klein, BG 2013, Cunningham's textbook of veterinary physiology, 5th edn, Elsevier Saunders.

Additional resources:

1. Akers, RM & Denbow DM 2013, Anatomy and physiology of domestic animals, Blackwell Publishing.
2. Aspinall, V 2015, Introduction to veterinary anatomy and physiology textbook, Elsevier
3. Hall, JE & Guyton A 2016, Guyton and Hall textbook of medical physiology; 13th edn, Elsevier
4. Reece, WO 2015, Functional anatomy and physiology of domestic animals, 4th edn, John Wiley & Sons.
5. Frandson, RD 2003, Anatomy and Physiology of Farm Animals, 7th edn, Wiley-Blackwell

Anatomy

Prescribed textbooks:

1. Evans, HE 2010, Guide to the dissection of the dog, Saunders/Elsevier.
2. König, HE, Liebich, HG and Bragulla, H 2014, Veterinary anatomy of domestic mammal: textbook and colour atlas, Schattauer.

Additional resources:

1. Dyce, K and Wensing, W 2010, Textbook of Veterinary Anatomy, Saunders/Elsevier.
2. Aspinall, V 2015, Introduction to veterinary anatomy and physiology textbook, Elsevier.
3. Barone, R 2009, Anatomie comparée des mammiféres domestiques, Vigot.
4. De Lahunta, A., Glass, E. N., & Kent, M. (2014). Veterinary Neuroanatomy and Clinical Neurology-E-Book. Elsevier Health Sciences.
5. DelaGunta and Habel, RE 1986, Applied Veterinary Anatomy, Saunders.
6. Diesem, C., & Getty, R. (1975). Sisson and Grossman's The Anatomy of Domestic Animals. WB Saunders Company

Histology

Prescribed textbooks:

1. Bacha, WJ 2012, Color atlas of veterinary histology, Wiley-Blackwell.
2. Junqueira's basic histology: text and atlas 2010, McGraw-Hill Medical.

Additional resources:

1. Eurell, JA, and Frappier, BL 2013, Dellmann's textbook of veterinary histology. John Wiley & Sons.
2. Garg, K 2014, Textbook of histology: colour atlas, CBS.
3. Kerr, JB 2010, Functional histology, Mosby/Elsevier.

Embryology

Prescribed textbooks:

1. Hyttel, P, Sinowatz, F, Vejlsted, M and Betteridge, K 2010, Essentials of domestic animal embryology, Saunders/Elsevier.
2. McGeady, TA, Quinn, PJ, FitzPatrick, ES, Ryan, MT, Kilroy, D, & Lonergan, P 2006, Veterinary embryology, Blackwell Pub.

Additional resources:

1. Carlson, BM 2009, Human embryology and developmental biology, Mosby/Elsevier.
2. Sadler, T. W 2015, Langman's medical embryology, Wolters Kluwer.

Module Title: VETERINARY PROFESSIONAL SKILLS II	
Module Code	V3610EV
NQF Level	6
Notional Hours	10
Contact hours	Lectures: 1 x 1hr lecture / week for 6 weeks
Additional learning requirements	None
NQF Credits	1
(Co-requisites) **Prerequisite**	None
Compulsory/Elective	Compulsory
Semester Offered	CS2

Module Purpose

The purpose of this module is to assist the second-year veterinary student to learn to manage stress, develop resilience and to review study methods for effectiveness.
The emphasis will be on developing the following skills: Stress management, resilience, creating personal flow, goal setting, study methods.

“We cannot expect anyone to help us live; we must discover how to do it by ourselves.” Mihaly Cskszentmihalyi

Overarching Learning Outcome

To develop life skills specific to a future career as a Veterinary Professional.

Specific Learning Outcomes

On completing the module students should be able to:

1. Discuss stress and its effect on (academic) performance and personal happiness
2. Function effectively under stress, and display flexibility and functionality in the face of uncertainties inherent in assessing patients' health problems
3. Define resilience and effective strategies to develop personal grit
4. Explain how to cultivate mindfulness and learn about various mindfulness practices
5. Describe minimalism and its relations to leading a sustainable life
6. Develop a personal stress management plan
7. State the “One Health” concept and certain relating to issues of global sustainability, how it relates to young professionals and the changing dynamics in the world
8. Develop study methods and a study plan to achieve your academic goals

Module Content

Study methods: study plan
Concentration and focus
Conceptual thinking: flexibility; mental agility; change management
Stress: performance; happiness; stress management plan; including self-care in relation to compassion; burnout
Resilience: personal grit
Mind strategies (your mind is your strongest muscle)
Mindfulness: mindfulness practices; minimalism
Wheel of Life, Wheel of work: personal growth and purpose.
One Health: Global sustainability challenges and individual contribution

Learning and Teaching Strategies/Activities

Blended teaching model through integrated lectures, real life simulations, case studies

Student Assessment Strategies

Continuous Assessment: 1 assignment for final CA mark (e.g. written assignment, group assignment, role-play and / or presentation).
Continuous participation assessment during compulsory lecture attendance.

Learning and Teaching Enhancement Strategies

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

Learning Resources:

1. All required resources will be supplied to students in hard and/or soft copy, updated annually.

Module Title: ANIMAL PRODUCTION FARM VISITS	
Module Code	V3602EF
NQF Level	6
Notional Hours	20
Contact hours	Lectures and Practical: Integrated 7 hours per week for 6 weeks (6 full days – 1 day per week)
Additional learning requirements	Full day field trips
NQF Credits	2
(Co-requisites) **Prerequisite**	None
Compulsory/Elective	Compulsory
Semester Offered	CS2
Module Purpose	
The purpose of this module is to expose students to practical experience on animal production in Namibia.	
Overarching Learning Outcome	
Explain domestic animal production systems applicable to Veterinary Medicine using a holistic approach.	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Identify the production environment, farm features and enterprise, production system, infrastructure and equipment, farm management including record keeping system, health interventions, identification and traceability system, animal welfare.	

Module Content

Animal production practices in different sectors: commercial, communal and semi intensive in cattle, sheep, goats, poultry and pigs.

Learning and Teaching Strategies/Activities

Blended teaching model: Practical visits with on-the-job training and mentorship approach, apply knowledge and concepts through problem solving and participation in daily activities

Student Assessment Strategies

Continuous assessment: a minimum of 3 field reports.
These field reports will be used as reference material in the Animal Production module.

Learning and Teaching Enhancement Strategies

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

Learning resources:

1. Animal Production Practical Manual (will be provided to the students)
2. Almeida, A.M., Schwalbach, L.M., De Waal, H.O., Greyling, J.P.C. and Cardoso, L.A., 2006. The effect of supplementation on productive performance of Boer goat bucks fed winter veld hay. Tropical Animal Health and Production, 38(5), pp.443-449.
3. Blocks, F.S., FEED SUPPLEMENTATION BLOCKS.
4. Casey, N.H. and Maree, C. eds., 1993. Livestock production systems: principles and practice. Agri Development Foundation.
5. Casey, N.H., 2009. African horizons in animal and wildlife sciences.
6. Kruger, B. and Lammerts-Imbuwa, L., 2008. Training manual: Livestock marketing in Namibia. Namibia National Farmers Union.
7. Large stock management in Namibia, by: Hemut Stehn, (Available through internet)
8. Lange, D.D., 2008. Small stock management. Joint Presidency Committee.
9. Retnani, Y., Barkah, N.N. and Saenab, A., 2020. Processing Technology of Feed Wafer to Increase Feed Production and Efficiency. WARTAZOA. Indonesian Bulletin of Animal and Veterinary Sciences, 30(1), pp.37-50.
10. Wilson, R.T., 2009. Dr WJA Payne: an appreciation. Tropical animal health and production, 41(7), pp.995-998.
11. Williamson, G. and Payne, W.J.A., 1959. An introduction to animal husbandry in the tropics. With a foreword by RS Marshall. An introduction to animal husbandry in the tropics. With a foreword by RS Marshall.
12. Schiere, J.B., 1995. Cattle, straw and system control: a study of straw feeding systems. Schiere.)

Module Title: PASTURE SCIENCE	
Module Code	V3660EP
NQF Level	6
Notional Hours	60
Contact hours	Lectures: 4 x 1hr lecture / week for 6 weeks Practicals: 1 x 3hr practical / week for 4 weeks
Additional learning requirements	None
NQF Credits	6
(Co-requisites) **Prerequisite**	Veterinary Structure & Function I Veterinary Structure & Function II
Compulsory/Elective	Compulsory
Semester Offered	CS2

Module Purpose

The purpose of this module is to provide students with an overview of the role of rangeland and pasture management to the livestock production in Namibia.

Overarching Learning Outcome

Discuss and apply knowledge of plants and pastures relevant to extensive farming in Namibia.

Specific Learning Outcomes

On completing the module students should be able to:

1. Identify and recommend the grazing intensity for different rangelands based on forage availability and livestock requirements.
2. Discuss the importance of different rangeland assessment methods.
3. Discuss the impact of animals, fires and climate on pastures for them to remain vigorous and productive under natural conditions.
4. Discuss the causes of rangeland degradation (bush encroachment) and mitigation strategies.
5. Explain the role of plants, rangelands and herbivores in the production of biogas and its economic benefits.
6. Discuss the drought management strategies for Namibian ranchers.
7. Identify a holistic approach to pasture management and utilization
8. Discuss the role of plants, rangelands and herbivores in the production of biogas and its economic benefits

Module Content

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
Palatable and non-palatable pastures adapted to the Namibian climatic conditions
Establishment of perennial and annual pastures: natural and planted pastures; utilization and management

Learning and Teaching Strategies/Activities

Blended teaching model through lectures, class discussions, tutorials and practicals.

Student Assessment Strategies

Continuous Assessment: Minimum 2 theory assessments (1hr - 50marks) and at least 3 marked practical assessments. Students' contribution for example in practicals and oral quizzes.

Learning and Teaching Enhancement Strategies

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

Learning resources:

1. MÜller, M.A.N. (1984). Grasses of South West Africa/Namibia. Directorate of Agriculture and Forestry. Department of Agriculture and Natural Conservation, Windhoek, South West Africa/Namibia.
2. Stehen, H. (2008). Rangeland Management. Joint Presidency committee (NAU and the NNFU). Windhoek, Namibia.
3. Tainton, N.M. (1999). Veld Management in South Africa. University of Natal Press. Pietermaritzburg. South Africa.
4. Van Oudtshoorn, F. (1999). Guide to Grasses of Southern Africa. Briza publication. Pretoria, S.A.
5. Range and Pasture Notes or Manuals for grass classification and identification
6. African Journal of Range and Forage Science. Or Rangeland Ecology and Management.

Module Title: VETERINARY MICROBIOLOGY I	
Module Code	V3660EM
NQF Level	6
Notional Hours	60
Contact hours	Lectures: 4x 1hr lectures / week for 6 weeks Practical: 1 x 3hrs practical / alternate week for 6 weeks
Additional learning requirements	None
NQF Credits	6
(Co-requisites) **Prerequisite**	None
Compulsory/Elective	Compulsory
Semester Offered	CS2

Module Purpose

The purpose of this module is to provide students with a general overview on the history of microbiology, morphology, structure, growth and nutrition of bacteria, virus and fungi. It will also introduce them to the diseases different groups of these pathogens may cause in domestic and farm animals.

Overarching Learning Outcome

Discuss different categories of pathogenic microorganisms including bacteria, fungi and viruses, as well as related microbial diseases in domestic and farm animals.

Specific Learning Outcomes

On completing the module students should be able to:

1. Discuss the main milestones and scientists in the history of microbiology
2. Classify microorganisms in different taxonomic groups and give them a proper name
3. Discuss the importance of microorganisms in human and animal health and their application in industry and impact on ecology
4. Describe the role of a microbiology laboratory, its set up, the reagents, materials and equipment therein, and their use
5. Describe the structure and the function of different microorganisms (bacteria, fungi and viruses)
6. Describe the preparation and use of different types of culture media used in the isolation of pathogenic bacteria

Module Content

General microbiology: Introduction and history of microbiology; morphology, structure, growth and nutrition of bacteria, virus and fungi; systematics; taxonomy including classification and nomenclature of bacteria; microbial ecology.
Diagnostic microbiology: Equipment, preparation of culture media
Mycology: Introduction, taxonomy, classification of fungi, morphology, growth
Virology: Introduction to viruses, systematics, taxonomy and classification of viruses

Learning and Teaching Strategies/Activities

Blended teaching model through lectures, class discussions, tutorials and practicals

Student Assessment Strategies

Continuous Assessment: Minimum 2 theory assessments (1hr - 60marks – each test count 30%) and at least 3 marked practical assessments (each assignment count 10%).

Learning and Teaching Enhancement Strategies

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 and tests

Learning resources:

1. P.J. Quinn, B.K. Markey, M.E. Carter, W.J.C. Donelly, F.C. Leonard (2002). Veterinary Microbiology and Microbial diseases. Blackwell Publishing.
2. GR. Carter, Darla J Wise (2004). Essentials of Veterinary Bacteriology and Mycology, Iowa State Press, Sixth Ed.
3. F.A. Murphy, E.P.J. Gibbs, M.C. Horzinek and M.J. Veterinary Virology

Module Title: VETERINARY STRUCTURE & FUNCTION III	
Module Code	V3681ES
NQF Level	6
Notional Hours	350
Contact hours	Lectures: 6x 1hr lectures / week for 13 weeks (2023: 8x 1hr lectures / week for 13 weeks) Practical: 2x 3hr practicals / week for 13 weeks 12hrs integrated lectures and practicals per week (2023: 14hrs integrated lectures and practicals per week)
Additional learning requirements	None
NQF Credits	35
(Co-requisites) **Prerequisite**	Veterinary Terminology Introduction to Microscopy Veterinary Structure & Function I Veterinary Structure & Function II
Compulsory/Elective	Compulsory
Semester Offered	1

Module Purpose

The purpose of this module is to enable students to gain an understanding of the basic and applied aspects of the structure and function of the reproductive, endocrine, lymphoreticular and thermoregulatory/integumentary systems and special senses (pain, hearing, vision and equilibrium) of domestic animals. 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.

Overarching Learning Outcome

Demonstrate knowledge of reproductive, endocrine lymphoreticular and thermoregulatory / integumentary systems and special senses in anatomy, physiology, embryology and histology of domestic animals.

Specific Learning Outcomes

On completing the module students should be able to:

1. Dissect clinically relevant topographic anatomical features of the male and female reproductive systems, endocrine, lymphoreticular and thermoregulatory / integumentary systems and special senses of domestic animals.
2. Identify clinically relevant topographic anatomical features of male and female reproductive systems, endocrine, lymphoreticular and thermoregulatory /

integumentary systems and special senses domestic animals in demonstration specimens.

3. Identify clinically relevant topographic anatomical features of the male and female reproductive systems, endocrine, lymphoreticular and thermoregulatory / integumentary systems and special senses of domestic animal using palpation.
4. Demonstrate application of topographic anatomy in clinical examination of the male and female reproductive systems, endocrine, lymphoreticular and thermoregulatory / integumentary systems and special senses of domestic animals.
5. Describe the structure and functions of skin with regard to temperature regulation and physiological response to the environment.
6. Explain the physiological control of body temperature in health and disease situations.
7. 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.
8. Describe the structure and functions of the male and female reproductive systems including species differences where relevant.
9. Describe the causes and mechanism for visceral pain perception.
10. Define noxious, nociception, innocuous, allodynia, hyperalgesia, peripheral- & central sensitization.
11. Differentiate between physiological- and pathological pain.
12. Explain first pain, second pain, hyperalgesia, allodynia, physiological pain, pathological pain
13. Describe the pathophysiology peripheral- and central sensitisation.
14. Describe descending pain modulation.
15. Explain principles and applications of sensory physiology as it relates to hearing, vision and equilibrium.

Module Content

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.

Female reproductive system: ovaries, uterine tube, uterus, vagina vestibule, vulva and mammary glands.

Integumentary / thermoregulatory system: skin; epidermal structures; horn; hooves; nails; skin glands.

Endocrine system: adenohypophysis; adrenal gland

Lympho-reticular system: spleen; lymphatic vessels; lymph node; thymus.

Special senses: eye; inner ear.

Physiology:

Reproductive system: genital glands; oestrus cycle; mammary gland
Integumentary / thermoregulatory system: 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.
Endocrine system: endocrine glands; functions of the endocrine system; systemic effects of main hormones; the renin-angiotensin-system; endocrine versus nervous system regulation.
Special senses: sight; hearing; balance; pain

Embryology:

Development of the:
Reproductive system: male; female
Integumentary system: including nails; hooves; horns.
Endocrine glands: adenohypohysis; thyroid gland; adrenal glands.
Lympho-reticular system
Special senses: eye; ear

Histology:

Reproductive system: Male – testis; ductus deferens; accessory sex glands (ampulla of ductus deferens; vesicular glands; prostate glands; bulbourethral glands); penis. Female – ovaries; uterine tube; uterus; vagina vestibule; vulva; mammary glands.
Lympho-reticular system: spleen; lymphatic vessels; lymph nodes; thymus.

Learning and Teaching Strategies/Activities

Blended teaching model through integrated lectures, dissections, presentations, case studies, illustrations, microscopy practicals, live animal practicals, written assignments, group work, class discussions.

Student Assessment Strategies

Continuous Assessment: Minimum 4 theory assessments (one in each section) and at least 3 practical assessments (one in each: Anatomy, Histology and Physiology).
CA calculation: Anatomy 40%; Physiology 30%; Histology 20%; Embryology 10%

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

Learning and Teaching Enhancement Strategies

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

Prescribed Learning Resources

Physiology

Prescribed textbooks:

1. Reece, WO, Erickson, HH, Goff, JP & Uemura, EE 2015, Dukes' physiology of domestic animals, 13th edn, John Wiley & Sons.
2. Klein, BG 2013, Cunningham's textbook of veterinary physiology, 5th edn, Elsevier Saunders.

Additional resources:

1. Akers, RM & Denbow DM 2013, Anatomy and physiology of domestic animals, Blackwell Publishing.
2. Aspinall, V 2015, Introduction to veterinary anatomy and physiology textbook, Elsevier
3. Hall, JE & Guyton A 2016, Guyton and Hall textbook of medical physiology; 13th edn, Elsevier
4. Reece, WO 2015, Functional anatomy and physiology of domestic animals, 4th edn, John Wiley & Sons.
5. Frandson, RD 2003, Anatomy and Physiology of Farm Animals, 7th edn, Wiley-Blackwell

Anatomy

Prescribed textbooks:

1. Evans, HE 2010, Guide to the dissection of the dog, Saunders/Elsevier.
2. König, HE, Liebich, HG and Bragulla, H 2014, Veterinary anatomy of domestic mammal: textbook and colour atlas, Schattauer.

Additional resources:

1. Dyce, K and Wensing, W 2010, Textbook of Veterinary Anatomy, Saunders/Elsevier.
2. Aspinall, V 2015, Introduction to veterinary anatomy and physiology textbook, Elsevier.
3. Barone, R 2009, Anatomie comparée des mammiféres domestiques, Vigot.
4. De Lahunta, A., Glass, E. N., & Kent, M. (2014). Veterinary Neuroanatomy and Clinical Neurology-E-Book. Elsevier Health Sciences.
5. DelaGunta and Habel, RE 1986, Applied Veterinary Anatomy, Saunders.
6. Diesem, C., & Getty, R. (1975). Sisson and Grossman's The Anatomy of Domestic Animals. WB Saunders Company

Histology

Prescribed textbooks:

1. Bacha, WJ 2012, Color atlas of veterinary histology, Wiley-Blackwell.
2. Junqueira's basic histology: text and atlas 2010, McGraw-Hill Medical.

Additional resources:

1. Eurell, JA, and Frappier, BL 2013, Dellmann's textbook of veterinary histology. John Wiley & Sons.
2. Garg, K 2014, Textbook of histology: colour atlas, CBS.
3. Kerr, JB 2010, Functional histology, Mosby/Elsevier.

Embryology

Prescribed textbooks:

1. Hyttel, P, Sinowatz, F, Vejlsted, M and Betteridge, K 2010, Essentials of domestic animal embryology, Saunders/Elsevier.
2. McGeady, TA, Quinn, PJ, FitzPatrick, ES, Ryan, MT, Kilroy, D, & Lonergan, P 2006, Veterinary embryology, Blackwell Pub.

Additional resources:

1. Carlson, BM 2009, Human embryology and developmental biology, Mosby/Elsevier.
2. Sadler, T. W 2015, Langman's medical embryology, Wolters Kluwer.

Module Title: ANIMAL PRODUCTION	
Module Code	V3603EP
NQF Level	6
Notional Hours	160
Contact hours	Lectures: 2x 1hr lectures / week for 13 weeks per semester Practical: 1x 3hrs practical / 4th week for 13 weeks per semester
Additional learning requirements	None
NQF Credits	16
(Co-requisites) **Prerequisite**	(Animal Production Farm Visits) Veterinary Structure & Function I Veterinary Structure & Function II
Compulsory/Elective	Compulsory
Semester Offered	1 and 2 (year module)

Module Purpose

The purpose of this module is to provide 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.

Overarching Learning Outcome

Discuss the livestock production industry in Namibia.

Specific Learning Outcomes

On completing the 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 including feeding (beef cattle, dairy cattle, sheep, goats, poultry and pigs).
7. Formulate nutritional feeding programs in livestock
8. Identify livestock products markets and schemes in Namibia, regionally and internationally.
9. Discuss marketing, marketing channels, and animal transportation to the market.
10. Explain the relative importance and control of diseases with economic and trade implications.

11. Discuss the importance of the livestock identification and traceability system in Namibia (NamLITS)

Module Content

Distribution of livestock in Namibia
Livestock breed characteristics (cattle, pigs, goats, sheep and poultry) farmed in Namibia
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

Learning and Teaching Strategies/Activities

Blended teaching model through lectures, assignments and practicals

Student Assessment Strategies

Continuous Assessment: minimum 6 theory assessments and 3 practical assessments

Examination: 1 x 3hr theory paper

Learning and Teaching Enhancement Strategies

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
- Audits by the relevant competent authorities

Prescribed Learning Resources

Prescribed textbook:

1. Casey, N.H. and Maree, C. eds., 1993. Livestock production systems: principles and practice. Agri Development Foundation.

Additional resources:

1. Almeida, A.M., Schwalbach, L.M., De Waal, H.O., Greyling, J.P.C. and Cardoso, L.A., 2006. The effect of supplementation on productive performance of Boer goat bucks fed winter veld hay. Tropical Animal Health and Production, 38(5), pp.443-449.
2. Blocks, F.S., FEED SUPPLEMENTATION BLOCKS.
3. Casey, N.H., 2009. African horizons in animal and wildlife sciences.
4. Kruger, B. and Lammerts-Imbuwa, L., 2008. Training manual: Livestock marketing in Namibia. Namibia National Farmers Union.
5. Large stock management in Namibia, by: Hemut Stehn, (Available through internet)
6. Lange, D.D., 2008. Small stock management. Joint Presidency Committee.
7. Retnani, Y., Barkah, N.N. and Saenab, A., 2020. Processing Technology of Feed Wafer to Increase Feed Production and Efficiency. WARTAZOA. Indonesian Bulletin of Animal and Veterinary Sciences, 30(1), pp.37-50.
8. Wilson, R.T., 2009. Dr WJA Payne: an appreciation. Tropical animal health and production, 41(7), pp.995-998.
9. Williamson, G. and Payne, W.J.A., 1959. An introduction to animal husbandry in the tropics. With a foreword by RS Marshall. An introduction to animal husbandry in the tropics. With a foreword by RS Marshall.
10. Schiere, J.B., 1995. Cattle, straw and system control: a study of straw feeding systems. Schiere.)

Module Title: VETERINARY MICROBIOLOGY II	
Module Code	V3611EM
NQF Level	6
Notional Hours	150
Contact hours	Lectures: 4x 1hr lectures / week for 13 weeks Practical: 1x 3hr practical / alternate week for 13 weeks
Additional learning requirements	None
NQF Credits	15
(Co-requisites) **Prerequisite**	(Veterinary Microbiology I)
Compulsory/Elective	Compulsory
Semester Offered	1

Module Purpose

The purpose of this module is to provide students with a general overview about morphology, structure, growth and nutrition of bacteria, virus and fungi. It will also avail 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.

Overarching Learning Outcome

This module will provide students with an overview of the role of the veterinarians in the field of the microbiology, in particular for what concern the management of viral, bacterial and fungi related diseases.

Specific Learning Outcomes

On completing the module students should be able to:

1. Discuss the mode of multiplication, nutrition, growth, genetics of microbial pathogens
2. Explain the mechanism of action of antimicrobial agents and how bacteria (and other microorganisms) may resist their action
3. State the basic processes involved in in the pathogenesis of bacterial, fungal and viral diseases
4. Collect appropriate samples for microbiological analysis
5. Handle clinical samples safely in a laboratory and carry out elementary microbiological procedures
6. Perform basic relevant laboratory diagnostic tests
7. Discuss the characteristics of different groups of bacteria and the diseases they cause

8. State the strategies of replication, pathogenesis of viruses in each viral family
9. Discuss the diagnosis, prevention and control of viral diseases
10. Discuss prions and prion diseases

Module Content

General microbiology and bacteriology: 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; aerobic and anaerobic cultivation; isolation of bacteria in pure culture; morphological and cultural characteristics; biochemical characteristics; antibiogram and slide culture technique for fungus
Mycology: growth, nutrition and reproduction in fungi.
Virology: 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.

Learning and Teaching Strategies/Activities

Blended teaching model through lectures, class discussions, tutorials and practicals

Student Assessment Strategies

Continuous Assessment: Minimum 2 theory assessments (1hr - 60marks – each test count 30%) and at least 3 marked practical assessments (each assignment count 10%).

Examination: 1x 3hr theory paper

Learning and Teaching Enhancement Strategies

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 examinations

Prescribed Learning Resources

Prescribed textbook:

1. P.J. Quinn, B.K. Markey, M.E. Carter, W.J.C. Donelly, F.C. Leonard (2002). Veterinary Microbiology and Microbial diseases. Blackwell Publishing.

Module Title: ANIMAL ETHOLOGY	
Module Code	V3601EE
NQF Level	6
Notional Hours	80
Contact hours	Lectures: 2x 1hr lectures / week for 13 weeks Practical: 1x 3hr practical / alternate week for 13 weeks
Additional learning requirements	None
NQF Credits	8
(Co-requisites) **Prerequisite**	Veterinary Structure & Function I Veterinary Structure & Function II
Compulsory/Elective	Compulsory
Semester Offered	1
Module Purpose	
The purpose of this module is to provide a brief history of the study of animal ethology, the interpretation of animal behaviour, major types of behaviour in domestic animals and highlight behavioural responses of animals to stressors related to husbandry, housing, transport, slaughter, training and performance.	
Overarching Learning Outcome	
Discuss basic animal behaviour, and how various factors affect behavioural responses in identified domestic animal breeds.	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Define animal ethology and differentiate between behavioural studies 2. Differentiate and describe the major types of behaviour in domestic animals 3. Describe mechanical restraint and handling of selected domestic animals 4. Describe the flight zone and point of balance for low stress handling of cattle, sheep, and pigs 5. Consistently display safe and systematic competence in animal handling 6. Identify and describe selected breeds of dogs, cats, horses, pigs, sheep, goats, poultry, cattle and wildlife.	

Module Content

Behavioural adaptations of domestic animals to their environment
Appropriate animal restraining and handling practices
History of the study of animal ethology
Interpretation of animal behaviour
Major types of behaviour in domestic animals
Selected animal breeds

Learning and Teaching Strategies/Activities

Blended teaching model through lectures, practicals, field excursions and class discussions

Student Assessment Strategies

Continuous Assessment: minimum 6 assessments (Theory and Practical assessments)

Examination: 1 x 2hr paper

Learning and Teaching Enhancement Strategies

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
- Audits by the relevant competent authorities

Prescribed Learning Resources

Prescribed textbooks:

1. Broom, D.M. and Fraser, A.F., 2015. Domestic animal behaviour and welfare. Cabi.
2. Grandin, T. ed., 2007. Livestock handling and transport. Cabi.Broom, D.M. & Fraser, A.F., 2007. Domestic Animal Behaviour and Welfare (4th ed)

Additional resources:

For the fundamentals of ethology:

1. Digweed, S.M. and Rendall, D., 2006. Review of The Behavior of Animals: Mechanisms, Function and Evolution
2. Electronica, P., 2012. ALCOCK, J. 2005. Animal behavior: an evolutionary approach. CENTRO DE CIÊNCIAS BIOLÓGICAS E DA SAÚDE, 42, p.71.
3. Manning, A. and Dawkins, M.S., 1998. An introduction to animal behaviour. Cambridge University Press.McFarland, D. 1993. Animal Behaviour–Psychobiology, Ethology & Evolution. (Longman)

For applied ethology:

1. Fraser, A.F. and Broom, D.M., 1997. Farm animal behaviour and welfare (No. Ed. 3). CAB international.
2. Houpt, K.A., Goodwin, D., Uchida, Y., Baranyiová, E., Fatjó, J. and Kakuma, Y., 2007. Proceedings of a workshop to identify dog welfare issues in the US, Japan, Czech Republic, Spain and the UK. Applied Animal Behaviour Science, 106(4), pp.221-233Appleby, M. et al. 2011. Animal Welfare (2nd ed.; CABI)
3. Mason, G., 2006. Stereotypic behaviour in captive animals: fundamentals and implications for welfare and beyond. Stereotypic animal behaviour: fundamentals and applications to welfare, 2.

Other Essential Books:

1. Anderson, R.S. and Edney, A.T., 1991. Practical animal handling.Animal restraint for veterinary professionals / C.C. Sheldon Teresa Sonsthagen James Topel.
2. Buchholz, R., 2006. Should animal behaviorists teach conservation. Conserv. Behav, 4, pp.3-4.
3. Fraser, D., 2008. Understanding animal welfare: the science in its cultural context.,(Wiley-Blackwell: Chichester, UK)
4. Manning, A. and Dawkins, M.S., 1998. An introduction to animal behaviour. Cambridge University Press.
5. Hötzel, M.J., Appleby, M.C., Weary, D.M. and Sandøe, P., 2014. Improving farm animal welfare: Is evolution or revolution needed in production systems. Dilemmas in animal welfare, pp.67-84.
6. Rho, J.R., Srygley, R.B. and Choe, J.C., 2004. Behavioral ecology of the Jeju pony (Equus caballus): Effects of maternal age, maternal dominance hierarchy and foal age on mare aggression. Ecological Research, 19(1), pp.55-63.)
7. Yeates, J., 2012. Animal welfare in veterinary practice. John Wiley & Sons.

Module Title: VETERINARY GENETICS	
Module Code	V3621EG
NQF Level	6
Notional Hours	80
Contact hours	Lectures: 2x 1hr lectures /week for 13 weeks Practical: 1 x 3hr practical / 4th week for 13 weeks
Additional learning requirements	None
NQF Credits	8
(Co-requisites) **Prerequisite**	None
Compulsory/Elective	Compulsory
Semester Offered	1

Module Purpose

The purpose of this module is to provide an overview of introductory aspects of genetics that are relevant to veterinarians by covering a variety of topics that include genetic improvement strategies, heritability, inbreeding, underlying genetic causes of disease, immunogenetics and control of inherited diseases.

Overarching Learning Outcome

Describe genetic principles relevant to Veterinary Medicine.

Specific Learning Outcomes

On completing the module students should be able to:

1. Apply simple and complex inheritance concepts to solving genetics problems
2. Describe single gene disorders
3. Discuss the forces that change gene frequency in a population
4. Describe the different types of chromosomal and gene mutations
5. Apply the Hardy-Weinberg law in estimation of gene and genotype frequencies
6. Discuss inherited defects in selected farm animals
7. Explain the partitioning of variation into its causal components
8. Discuss the effects of inbreeding and cross breeding in production animals
9. Discuss the different commercial beef cattle breeding programmes
10. Explain how genetic diversity is generated in antibody formation
11. Explain the basis of genetic resistance to animal diseases
12. Discuss applications of biotechnology in animal production and disease diagnosis
13. Discuss examples of breeding for disease resistance in livestock

Module Content

Aspects of genetics relevant to animal diseases and production
Mendelian genetics
Modes of gene action: dominance; additive; epistasis
Single gene disorders
Chromosomal mutations
Gene mutations
Applied population genetics
Quantitative variation
Inbreeding
Crossbreeding
Types of commercial breeding programmes in beef cattle
Introduction to immunogenetics
The MHC
Genetics of disease resistance
Biotechnology in animal production and disease diagnosis: AI; MOET; IVM; IVF; control of sex ratio; PCR-based disease diagnostics
Special topics: case studies of breeding for disease resistance

Learning and Teaching Strategies/Activities

Blended teaching model through lectures practicals, tutorials and class discussions

Student Assessment Strategies

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

Examination: 1 x 2hr theory paper

Learning and Teaching Enhancement Strategies

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 all 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
- Regular reviews of module content
- Grading of assignments, tests and examinations

Prescribed Learning Resources

Prescribed textbooks:

1. Nicholas, FW. 2010. Introduction to Veterinary Genetics, 3rd edn. Wiley-Backwell
2. Klug, W.S., Cummings, M.R., Spencer, C.A. and Palladino, M.A. 2012. Concepts of Genetics. 10th Edn. Pearson.

Additional resources:

1. Review articles on selected topics will be supplied

Module Title: VETERINARY PARASITOLOGY I (2023 only)	
Module Code	V3651AP
NQF Level	6
Notional Hours	150
Contact hours	Lectures: 4x 1hr lectures / week for 13 weeks Practical: 1x 3hr practical / alternate week for 13 weeks
Additional learning requirements	None
NQF Credits	15
(Co-requisites) **Prerequisite**	Veterinary Biochemistry
Compulsory/Elective	Compulsory
Semester Offered	1

Module Purpose

The purpose of this module is to impart knowledge 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.

Overarching Learning Outcome

On completion of the module, students should have a clear understanding of all classes of helminths, their veterinary, economic and public health importance and be able to design and implement a proper control program for each helminth.

Specific Learning Outcomes

On completing the module students should be able to:

1. Recognize the various classes of parasites.
2. Describe the pathologic and economic effects of selected endoparasites.
3. Recommend methods and strategies for controlling or minimizing endoparasitic infection, both in the individual animal and on a herd basis.
4. Identify representative parasite 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

Introduction to general parasitology: terminology used in parasitology; general morphology, biology and general characteristics of various parasite classes.
General parasitology: parasites and parasitism; types of hosts; host-parasite relationships; mode of transmission of parasites; methods of dissemination of infective stages of parasites; 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, diagnosis; general control measures of trematodes, cestodes and nematodes of veterinary importance in the region; diagnosis, treatment and prevention of diseases caused by helminths; biological control of endoparasites.

Learning and Teaching Strategies/Activities

Blended teaching model through lectures, practical sessions and class discussions.

Student Assessment Strategies

Continuous assessment: Minimum of two (2) theory tests (total contribution of 60%), at least one (1) marked practical test (total contribution of 30%) and laboratory reports (total contribution of 10%).

Final examination: One (1) 3hr theory paper (150 marks) and one (1) practical 2hr paper.

Learning and Teaching Enhancement Strategies

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
- Monitoring and evaluation by relevant professional regulatory bodies

Prescribed Learning Resources

Prescribed textbooks:

1. Veterinary Helminthology, 2013. Mandal S.C. Satish Serial Publishing House. ISBN: 978-93-81226- 8-5.
2. Veterinary Parasitology, 2015. Taylor M.A., Coop R.L. & Wall R.L. (Eds). Wiley – Blackwell, Oxford UK. 4th Edition 2015 (1,032 pages). ISBN: 978-0-470-67162-7

Additional resources:

1. http://www.afrivip.org/
2. https://www.cals.ncsu.edu/course/ent425/index.html (John R. Meyer)
3. http://www.merckvetmanual.com/mvm/index.html
4. http://labs.russell.wisc.edu/wisconsin-ticks/

Module Title: VETERINARY IMMUNOLOGY & VACCINOLOGY	
Module Code	V3602AI
NQF Level	6
Notional Hours	80
Contact hours	Lectures: 2x 1hr lectures / week for 13 weeks Practical: 1x 3hr practical / alternate week for 13 weeks
Additional learning requirements	None
NQF Credits	8
(Co-requisites) **Prerequisite**	(Veterinary Microbiology I) (Veterinary Microbiology II)
Compulsory/Elective	Compulsory
Semester Offered	2

Module Purpose

The purpose of this module is to provide an 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 response to infection.

Overarching Learning Outcome

Upon completion of this module, students should be able to discuss the basic principles and application of veterinary immunology, the development and application of veterinary vaccines as well as the benefits and constraints of vaccination as a component of integrated disease control.

Specific Learning Outcomes

After completing 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

Module Content

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: 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; immunization schedules with reference to Namibia.
Introduction to blood collection and serum processing, applications of immunology: immuno-serological reactions; vaccination and other immunization techniques; serological diagnosis of common animal diseases encountered in Namibia; vaccine testing.

Learning and Teaching Strategies/Activities

Blended teaching model to facilitate the achievement of learning outcomes will include details of lectures, laboratory activities, assignments and class discussions.

Student Assessment Strategies

Continuous assessment: minimum two written tests (50 marks each), two quizzes (25 marks each) and five marked practicals/tutorials/assignments (50 marks total, i.e. 10 marks each).

Examination: 1x 2hr theory paper

Learning and Teaching Enhancement Strategies

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
- Monitoring and evaluation by relevant professional regulatory bodies.

Prescribed Learning Resources

Prescribed textbooks:

1. Michael J. Day and Ronald D. Schultz (2014). Veterinary Immunology, Principles and Practice. 2nd Ed. CRC Group.
2. Ian Tizard (2012). Veterinary immunology. 9th Ed. Elsevier.

Additional resources:

1. Abul K. Abbas, Andrew H. Lichtman (2009). Basic Immunology, Functions and Disorders of the Immune System. 3rd ed.
2. Ian R. Tizard. Veterinary Immunology (9th Ed.)
3. Peter Lydyard, Alex Whelan, Michael Fanger (2011). Immunology (Bios Instant Notes). Taylor & Francis e-Library (3rd ed.)
4. College of Veterinary Medicine, The University of Georgia (2004). 28th Annual Report. Vaccinology.
5. Ronald D. Schultz. Ed. (1999). Veterinary vaccines and diagnostics. Academic Press, San Diego. (see UNAM library).

Module Title: ANIMAL NUTRITION	
Module Code	V3612EN
NQF Level	6
Notional Hours	150
Contact hours	Lectures: 4x 1hr lectures / week for 13 weeks Practical: 1x 3hr practical / alternate week for 13 weeks
Additional learning requirements	None
NQF Credits	15
(Co-requisites) **Prerequisite**	(Pasture Science) (Veterinary Structure & Function III) Veterinary Structure & Function I Veterinary Structure & Function II Veterinary Biochemistry
Compulsory/Elective	Compulsory
Semester Offered	2

Module Purpose

The purpose of this module is to provide students with an overview of the basic concepts in animal nutrition and analytical techniques used in assessing the feeding value of various animal feeds and feed formulation. The nutritional requirements of companion animals (dogs, cats and horses) will also be covered.

Overarching Learning Outcome

Identify and classify animal feeds, nutritional value of the feeds, formulation of rations and how animals utilise nutrients for production. Discuss the differences in feed digestibility in non-ruminants, ruminants and hind-gut fermenters among farm animals.

Specific 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 and importance of feed analysis and evaluation to livestock production.
4. Analyse animal feeds nutrient content and digestibility using different techniques
5. Discuss the processes of feed digestion and absorption of nutrients in ruminant and non-ruminant animals
6. Discuss vitamin and mineral nutrition
7. Discuss the feed intake in selected animals
8. Discuss factors affecting nutritive value of feedstuffs

9. Design and implement feed formulation schemes according to animal species needs
10. Discuss the common nutritional imbalances in selected animals

Module Content

Animal nutrition including key concepts and terminologies
The role of animal nutrition in animal production.
Animal nutrition of various production and companion animals.
Classification of animal feeds; general comparison of plants and other sources of nutrients; plants as feed sources with special focus on nutritive values, availability, affordability; feed fractions and their nutritional implications; contaminants and toxins in animal feeds; feed additives; laboratory feeds analysis methods; proximate and detergent systems; feed energy and protein partitioning using the Metabolisable System (ME & MP); digestibility and degradability estimation methods – in vitro, in vivo, in sacco techniques; feed intake and factors influencing intake in animals; feed formulation based on animal nutritional requirements; use of feed value estimates; mineral and vitamin nutrition

Learning and Teaching Strategies/Activities

Blended teaching model through lectures, assignments, quizzes, class discussions, field excursions and practicals in small (maximum 5 students) groups.

Student Assessment Strategies

Continuous Assessment: Minimum 2 theory assessments (1hr - 60marks – each test count 30%) and at least 3 marked practical assessments (each assignment and practical count 10%). Student's contribution 10% (for example in oral quizzes)

Examination: 1 x 3hr theory paper- 150 marks

Learning and Teaching Enhancement Strategies

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 at 5 year intervals
- Effective supervision and monitoring of assignments, tests and examinations
- Provision of feedback to students on assessed assessment activities to assist student progress and improvement

Prescribed Learning Resources

Prescribed textbooks:

1. McDonald P., Edwards R. A., Greenhalgh J. F. D., Morgan C. A., Sinclair L.A. and Wilkinson R. G. (Eds). 2010. Animal Nutrition, 7th Edition. Prentice Hall, London, UK.
2. Dryden G. M. (Ed.). 2011. Animal Nutrition Science, 1st Edition. CABI.

Additional reources:

1. Pond W. G., Church D. C., Pond R. R. and Schoknecht P. A. (Eds.). 2005. Basic Animal Nutrition and Feeding, 5th Edition. Wiley & Sons Publishers
2. Jurgens M., Bregendahl K., Coveldale J. and Hansen S. (Eds.). 2012. Animal Feeding and Nutrition, 11th Edition.
3. Mugdal V. (Ed.). 2012. Practical Animal Nutrition. New Indian Publishing Agency, New Dehli, India.
4. Minson D. J. (Ed.). 1990. Forage in Ruminant Nutrition. Academic Press Inc., San Diego, California, USA.
5. Church D. C. (Ed.). 1988. The Ruminant Animal – Digestive Physiology and Nutrition. Prentice-Hall Inc., New Jersey, USA.
6. Reddy D.V. (Ed.). 2018. Principles of Animal Nutrition. Third Edition.
7. Jurgens M. H., Bregendahl K., Coverdale J.A and Hansen S. L. (Eds.). 2012. Animal Feeding and Nutrition. Shutterstock Inc, USA.
8. Mehra U.R., Singh P. and Verma A. K. (Eds.). 2014. Animal Nutrition – Advances and Developments. Satish Serial Publishing House., India.
9. Tisch D. A. 2006. Animal Feeds, Feeding and Nutrition, and Ration Formulation with CD Rom., Thomson Corp., USA.
10. Lesson S. (2001). Nutrition of chicken. S. Lesson 4th edition.
11. McNab J. M. and Boorman K. N. 2002. Poultry feedstuffs supply, composition and nutritive value.
12. Orskov E. R. and Ryle M. 1990. Energy nutrition in ruminants.
13. Lowis A. and Southern L. L. 2000. Nutrition of Swine.

Electronic journals:

1. Animal Nutrition
2. Grass and Forage Science
3. South African Journal of Plant and Soil
4. South African Journal of Animal Science
5. Livestock Science
6. Tropical Grasslands
7. Animal Feed Science & Technology
8. Small Ruminant Research
9. Journal of Poultry Science
10. International Journal of Poultry Science
11. Journal of Dairy Science
12. Tropical Animal Health and Production
13. Tropical and Subtropical Agroecosystems
14. Range Ecology and Management
15. Animal Production Science

International organisations websites:

1. Food and Agriculture Organization (www.fao.org)
2. Feedipedia (www.feedipedia.org)
3. International Livestock Research Institute (www.ilri.org)
4. World Agroforestry Centre (www.worldagroforestrycentre.org)

Module Title: ANIMAL WELFARE	
Module Code	V3622EW
NQF Level	6
Notional Hours	80
Contact hours	Lectures: 2x 1hr lectures / week for 13 weeks Practical: 1x 3hr practical / alternate week for 13 weeks
Additional learning requirements	None
NQF Credits	8
(Co-requisites) **Prerequisite**	(Veterinary Structure & Function III) (Animal Ethology) Veterinary Structure & Function I Veterinary Structure & Function II
Compulsory/Elective	Compulsory
Semester Offered	2

Module Purpose

The purpose of this module is to highlight current animal welfare matters according to OIE recommendations and legislation on animal welfare in Namibia will be discussed.

Overarching Learning Outcome

Discuss and apply current animal welfare concepts in all species relevant to Veterinary Medicine.

Specific Learning Outcomes

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

1. Describe current animal welfare considerations as stipulated in the OIE recommendations, including the Five Freedoms
2. Discuss the physiological and behavioural factors that assist in assessing welfare of animal
3. Discuss the welfare of working animals
4. Discuss principles of and importance of transportation of animals destined for slaughter
5. Discuss principles and ethical requirements for animal slaughter, emergency slaughter and euthanasia
6. Discuss the welfare of working animals
7. Discuss animal protection and welfare legislation in Namibia
8. Discuss the role of veterinarians in disaster management

Module Content

Aspects of animal welfare science: Five Freedoms; OIE animal welfare recommendations.
Behavioural and animal husbandry issues affecting welfare: housing, handling, basic aspects of nutrition.
Introduction to animal welfare ethics.
I**nfluence of transport and the marketplace** on animal welfare
Ethics and principles of euthanasia.
Current relevant Namibian animal protection and welfare legislation: role of the welfare organisations.
Role of veterinarians in enhancement of animal welfare.

Learning and Teaching Strategies/Activities

Blended teaching model through lectures, practicals, field excursions and class discussions

Student Assessment Strategies

Continuous Assessment: minimum 6 assessments (Theory and Practical assessments)

Examination: 1 x 2hr paper

Learning and Teaching Enhancement Strategies

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
- Audits by the relevant competent authorities

Prescribed Learning Resources

Prescribed textbooks:

1. Broom, D.M. and Fraser, A.F., 2015. Domestic animal behaviour and welfare. Cabi.
2. Yeates, J., 2012. Animal welfare in veterinary practice. John Wiley & Sons..

Additional resources:

For the fundamentals of ethology:

1. Digweed, S.M. and Rendall, D., 2006. Review of The Behavior of Animals: Mechanisms, Function and Evolution
2. Electronica, P., 2012. ALCOCK, J. 2005. Animal behavior: an evolutionary approach. CENTRO DE CIÊNCIAS BIOLÓGICAS E DA SAÚDE, 42, p.71.
3. Manning, A. and Dawkins, M.S., 1998. An introduction to animal behaviour. Cambridge University Press.McFarland, D. 1993. Animal Behaviour–Psychobiology, Ethology & Evolution. (Longman)

For applied ethology:

1. Fraser, A.F. and Broom, D.M., 1997. Farm animal behaviour and welfare (No. Ed. 3). CAB international.
2. Houpt, K.A., Goodwin, D., Uchida, Y., Baranyiová, E., Fatjó, J. and Kakuma, Y., 2007. Proceedings of a workshop to identify dog welfare issues in the US, Japan, Czech Republic, Spain and the UK. Applied Animal Behaviour Science, 106(4), pp.221-233Appleby, M. et al. 2011. Animal Welfare (2nd ed.; CABI)
3. Mason, G., 2006. Stereotypic behaviour in captive animals: fundamentals and implications for welfare and beyond. Stereotypic animal behaviour: fundamentals and applications to welfare, 2.

Other essential books:

1. Anderson, R.S. and Edney, A.T., 1991. Practical animal handling. Animal restraint for veterinary professionals / C.C. Sheldon Teresa Sonsthagen James Topel.
2. Buchholz, R., 2006. Should animal behaviorists teach conservation. Conserv. Behav, 4, pp.3-4.
3. Fraser, D., 2008. Understanding animal welfare: the science in its cultural context.,(Wiley-Blackwell: Chichester, UK)
4. Grandin, T. ed., 2007. Livestock handling and transport. Cabi.Broom, D.M. & Fraser, A.F., 2007. Domestic Animal Behaviour and Welfare (4th ed)
5. Manning, A. and Dawkins, M.S., 1998. An introduction to animal behaviour. Cambridge University Press.
6. Hötzel, M.J., Appleby, M.C., Weary, D.M. and Sandøe, P., 2014. Improving farm animal welfare: Is evolution or revolution needed in production systems. Dilemmas in animal welfare, pp.67-84.
7. Rho, J.R., Srygley, R.B. and Choe, J.C., 2004. Behavioral ecology of the Jeju pony (Equus caballus): Effects of maternal age, maternal dominance hierarchy and foal age on mare aggression. Ecological Research, 19(1), pp.55-63.)

Module Title: BIOMETRY	
Module Code	V3632EB
NQF Level	6
Notional Hours	150
Contact hours	Lectures: 4x 1hr lectures / week for 13 weeks Tutorial: 1x 3hr tutorial / alternate week for 13 weeks
Additional learning requirements	None
NQF Credits	15
(Co-requisites) **Prerequisite**	None
Compulsory/Elective	Compulsory
Semester Offered	2

Module Purpose

The purpose of this module is 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.

Overarching Learning Outcome

Apply and interpret statistics relevant to Veterinary research.

Specific Learning Outcomes

On completing the 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 using statistical software
5. Describe and apply different types of measurements 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

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.

Learning and Teaching Strategies/Activities

Blended teaching model through lectures, class discussions, tutorials and practicals (computer lab and data measurement practicals)

Student Assessment Strategies

Continuous assessment: Student progress will be assessed through minimum one project assignment (25%), three assignments (10% each), three 1 hr tests (15% each).

Examination: 1 X 3 hour examination paper. In this exam use of a calculator is allowed and statistical tables and formulae will be provided.

Learning and Teaching Enhancement Strategies

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

Prescribed Learning Resources

Prescribed textbooks:

1. Shott, S. (1990) Statistics for health professionsals W.B Saunders Company, Philadelphia
2. Mead, R., Curnow, R. N., Hasted, and Curnow, R. M. (2012). Statistical Methods in Agriculture and Experimental Biology, Third Edition. CRC Press

Additional resources:

1. Betty R. Kirkwood and Jonathan A. C. Sterne; Essential Medical Statistics, Blackwell Science 2010
2. P. Armitage, G. Berry, J. N. S Mathews; Statistical Methods in Medical Research, Blackwell Science 2009
3. Aviva Petrie & Caroline Sabin, Medical Statistics at a Glance,Wiley-Blackwell2009

Electronic books:

1. Screenivaisaiah P.V (2016) Veterinary Biostatistics. International Book Distribution Company.
2. Shott, S. (1990) Statistics for health professionsals W.B Saunders Company, Philadelphia
3. Kaps, M. and Lamberson, W. (2009). Biostatistics for Animal Science: An Introductory Text. CABI Publisher
4. Jan W.Kuzma, Stephen E.Bohnenblust; Basic Statistics for HealthSciences, Mayfield PublishingCompany2001
5. Chap T. Le, Health and Numbers: A problems – Based introduction to Biostatistics, Wiley-Blackwell 2009
6. Michael J. Campbell & David Machin, Medical Statistics: A common-sense approach, John Wiley & Sons 1993
7. Wayne W. Daniel, Biostatistics–Basic Concepts and Methodology for Health Sciences, John Wiley & Sons 2010

Module Title: MOLECULAR BIOLOGY	
Module Code	V3642EM
NQF Level	6
Notional Hours	80
Contact hours	Lectures: 2x 1hr lectures / week for 13 weeks Practicals: 1x 3hr practical / alternate week for 13 weeks
Additional learning requirements	None
NQF Credits	8
(Co-requisites) **Prerequisite**	(Veterinary Genetics)
Compulsory/Elective	Compulsory
Semester Offered	2

Module Purpose

The purpose of this module is to equip students with theoretical and practical skills in molecular methods.

Overarching Learning Outcome

On completion of the module, students should have a clear understanding of molecular genetics and how it can be applied in diagnostics.

Specific Learning Outcomes

On completing the module students should be able to:

1. Describe gene structure and function, including transcription and translation.
2. Describe DNA replication, damage and repair.
3. Describe gene expression and its regulation as well exchange of genetic material between organisms.
4. Prepare genomic and plasmid nucleic acid.
5. Explain the principles behind various nucleic acid extraction protocols.
6. Perform nucleic acid extraction, amplification, restriction, analysis by gel electrophoresis, sequencing and sequence analysis.
7. Design appropriate primers.
8. Perform protein extraction and proteomic analysis.
9. Apply molecular biology to the study of animal health and disease conditions.

Module Content

Introduction to Molecular Biology: historical perspectives of Molecular Biology; overview of the current advances of Molecular Biology

Gene Structure and Function: review of structure of nucleic acid; overview of prokaryotic gene structure; overview of eukaryotic gene structure and non-coding DNA; structural organisation of eukaryotic chromosomes; morphology and functional elements of eukaryotic chromosomes; transposable DNA elements; genome wide analysis of gene function and structure; DNA replication and fidelity of replication; transcription and translation in prokaryotes eukaryotes (transcriptome and proteome- general account); gene expression regulation in prokaryotes and eukaryotes; DNA damage, repair and recombination; exchange of genetic information between bacteria; molecular basis of genetic disorders.

Basic Nucleic Acid Techniques: isolation of DNA and RNA from cells; restriction enzymes and their use in Molecular Biology; cleaving and joining of DNA molecules; nucleic acid amplification techniques; importance of nucleic acid amplification; Polymerase Chain Reaction (PCR) and its applications (Real-Time PCR and its application); other nucleic acid amplification techniques; post amplification detection methods; nucleic acid and protein blotting techniques: Southern, northern and western blotting.

Learning and Teaching Strategies/Activities

Blended teaching model through lectures, practical sessions and class discussions.

Student Assessment Strategies

Continuous assessment: Minimum of two (2) theory tests (total contribution of 60%), at least one (1) marked practical test (total contribution of 30%) and laboratory reports (total contribution of 10%).

Final examination: One (1) 2hr theory paper (100 marks).

Learning and Teaching Enhancement Strategies

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
- Monitoring and evaluation by relevant professional regulatory bodies.

Prescribed Learning Resources

Prescribed textbooks:

1. Krebs, J. E, Goldstein, E. S and Kilpatrick, S. T (2018). Lewin's Genes XII (12th Edition). Jones & Bartlett Learning, Burling, MA, USA ISBN-13: 9781284104493.
2. Lodish, H, Baltimore, D, Berk, A, Zipursky, S.L, Matsudaira, P and Darnell, J (2016). Molecular Cell Biology (8th Edition). Scientific American Books, New York; ISBN-978146483393, 1464183392.

Additional resources:

1. https://blast.ncbi.nlm.nih.gov/Blast.cgi
2. https://www.ncbi.nlm.nih.gov/tools/primer-blast/
3. https://primer3.ut.ee/

Module Title: VETERINARY STRUCTURE & FUNCTION IV (2023 only)	
Module Code	V3682ES
NQF Level	6
Notional Hours	320
Contact hours	Lectures: 3x 1hr lectures / week for 13 weeks Practical: 2x 3hr practicals / week for 13 weeks 9hrs of integrated lectures and practicals per week for 13 weeks
Additional learning requirements	None
NQF Credits	32
(Co-requisites) **Prerequisite**	(Veterinary Structure & Function III) Veterinary Terminology Introduction to Microscopy Veterinary Structure & Function I Veterinary Structure & Function II
Compulsory/Elective	Compulsory
Semester Offered	2

Module Purpose

The purpose of this module is 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.

(2023 only in Veterinary Structure & Function IV, will in future be covered in Veterinary Structure & Function II BVM I Semester 2 and Veterinary Structure & Function III BVM II Semester 2)

Overarching Learning Outcome

Demonstrate knowledge of urogenital and endocrine systems in anatomy, physiology, embryology and histology of domestic animals.

Specific Learning Outcomes

On completing the 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.

(2023 only in Veterinary Structure & Function IV, will in future be covered in Veterinary Structure & Function II BVM I Semester 2 and Veterinary Structure & Function III BVM II Semester 2)

Module Content

Gross anatomy:

Urinary system: general gross and topographic anatomy of the kidney; ureters; urinary bladder and urethra.

Reproductive system: 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. Gross anatomy of the female reproductive system; ovaries; uterine tube; uterus; vagina vestibule; vulva; mammary glands.

Endocrine system: gross anatomy of the adenohypophysis gland.

Physiology:

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.

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; mammary gland.

Embryology:

Development of the
Urinary system
Reproductive system: male and female.
Endocrine system: thyroid gland and adenohypophysis.

Histology:

Urinary system: kidney; ureters; urinary bladder; urethra.
Male reproductive system: testis; ductus deferens; accessory sex glands (ampulla of ductus deferens, vesicular glands, prostate glands and bulbourethral glands); penis.
Female reproductive system: ovaries; uterine tube; uterus; vagina vestibule; vulva; mammary glands.

(2023 only in Veterinary Structure & Function IV, will in future be covered in Veterinary Structure & Function II BVM I Semester 2 and Veterinary Structure & Function III BVM II Semester 2)

Learning and Teaching Strategies/Activities

Blended teaching model through integrated lectures, dissections, presentations, case studies, illustrations, laboratory practicals, live animal practicals, written assignments, group work, class discussions.

Student Assessment Strategies

Continuous Assessment: Minimum 4 theory assessments (one in each section) and at least 3 practical assessments (one in each: Anatomy, Histology and Physiology).
CA calculation: Anatomy 40%; Physiology 30%; Histology 20%; Embryology 10%

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

Learning and Teaching Enhancement Strategies

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

Prescribed Learning Resources

Physiology
Prescribed textbooks:

1. Reece, WO, Erickson, HH, Goff, JP & Uemura, EE 2015, Dukes' physiology of domestic animals, 13th edn, John Wiley & Sons.
2. Klein, BG 2013, Cunningham's textbook of veterinary physiology, 5th edn, Elsevier Saunders.

Additional resources:

1. Akers, RM & Denbow DM 2013, Anatomy and physiology of domestic animals, Blackwell Publishing.
2. Aspinall, V 2015, Introduction to veterinary anatomy and physiology textbook, Elsevier
3. Hall, JE & Guyton A 2016, Guyton and Hall textbook of medical physiology; 13th edn, Elsevier
4. Reece, WO 2015, Functional anatomy and physiology of domestic animals, 4th edn, John Wiley & Sons.
5. Frandson, RD 2003, Anatomy and Physiology of Farm Animals, 7th edn, Wiley-Blackwell

Anatomy

Prescribed textbooks:

1. Evans, HE 2010, Guide to the dissection of the dog, Saunders/Elsevier.
2. König, HE, Liebich, HG and Bragulla, H 2014, Veterinary anatomy of domestic mammal: textbook and colour atlas, Schattauer.

Additional resources:

1. Dyce, K and Wensing, W 2010, Textbook of Veterinary Anatomy, Saunders/Elsevier.
2. Aspinall, V 2015, Introduction to veterinary anatomy and physiology textbook, Elsevier.
3. Barone, R 2009, Anatomie comparée des mammiféres domestiques, Vigot.
4. De Lahunta, A., Glass, E. N., & Kent, M. (2014). Veterinary Neuroanatomy and Clinical Neurology-E-Book. Elsevier Health Sciences.
5. DelaGunta and Habel, RE 1986, Applied Veterinary Anatomy, Saunders.
6. Diesem, C., & Getty, R. (1975). Sisson and Grossman's The Anatomy of Domestic Animals. WB Saunders Company

Histology

Prescribed textbooks:

1. Bacha, WJ 2012, Color atlas of veterinary histology, Wiley-Blackwell.
2. Junqueira's basic histology: text and atlas 2010, McGraw-Hill Medical.

Additional resources:

1. Eurell, JA, and Frappier, BL 2013, Dellmann's textbook of veterinary histology. John Wiley & Sons.
2. Garg, K 2014, Textbook of histology: colour atlas, CBS.
3. Kerr, JB 2010, Functional histology, Mosby/Elsevier.

Embryology

Prescribed textbooks:

1. Hyttel, P, Sinowatz, F, Vejlsted, M and Betteridge, K 2010, Essentials of domestic animal embryology, Saunders/Elsevier.
2. McGeady, TA, Quinn, PJ, FitzPatrick, ES, Ryan, MT, Kilroy, D, & Lonergan, P 2006, Veterinary embryology, Blackwell Pub.

Additional resources:

1. Carlson, BM 2009, Human embryology and developmental biology, Mosby/Elsevier.
2. Sadler, T. W 2015, Langman's medical embryology, Wolters Kluwer.

Module Title: VETERINARY PARASITOLOGY II (2023 only)	
Module Code	V3652AP
NQF Level	6
Notional Hours	150
Contact hours	Lectures: 4x 1hr lectures / week for 13 weeks Practical: 1x 3hr practical / alternate week for 13 weeks
Additional learning requirements	None
NQF Credits	15
(Co-requisites) **Prerequisite**	Veterinary Biochemistry
Compulsory/Elective	Compulsory
Semester Offered	2

Module Purpose

The purpose of this module is to impart knowledge of (entomology) 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.

Overarching Learning Outcome

On completion of the module, students should have a clear understanding of all classes of ectoparasites, protozoa and rickettsia, their veterinary, economic and public health importance and be able to design and implement a proper control program for each of the identified parasites.

Specific Learning Outcomes

On completing the 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 clinically relevant genera/species of protozoa and rickettsiae including the role of their vectors respectively intermediate hosts.
3. Describe relevant disease manifestations of protozoan/rickettsial and ectoparasitic diseases in the animal host species (livestock as well as companion animals and wildlife).
4. Discuss the economic effects and public health implications of selected protozoan/rickettsial diseases and ectoparasitic infestations.

5. Recommend methods and strategies for control, prevention or minimizing protozoon/rickettsial infection and ectoparasitic infestations, both in the individual animal and on a herd basis.
6. Identify representative protozoon/rickettsial and ectoparasite species using laboratory and field techniques, recommend further appropriate diagnostic laboratory methods.
7. 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

Entomology: classification of veterinary ectoparasites (e.g., mosquitoes, biting flies, fleas, lice, ticks and mites) relevant to Namibia and southern Africa; morphology and biology of various arthropod ectoparasites; life cycle and diagnosis of selected species; parasitic role of different ectoparasites and their economic impact and human impact; vector role of different ectoparasites and/or intermediate hosts of protozoan/rickettsial diseases; control methods for ectoparasites including role and importance of biological control methods and chemical control and its effects on the environment; emergence of drug resistance and ways of mitigating resistance emergence.
Protozoology & Rickettsia: classification of protozoa and rickettsia; pathogenesis, pathology and clinical signs associated with various specific genera and/or species; diagnosis of different genera and/or species; control of different protozoa and rickettsia; use of vector control as a method of controlling specific protozoa and/or rickettsia.

Learning and Teaching Strategies/Activities

Blended teaching model through lectures, practical sessions and class discussions.

Student Assessment Strategies

Continuous assessment: Minimum of two (2) theory tests (total contribution of 60%), at least one (1) marked practical test (total contribution of 30%) and laboratory reports (total contribution of 10%).

Final examination: One (1) theory paper (150 marks) and one 2hr practical paper

Learning and Teaching Enhancement Strategies

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
- Monitoring and evaluation by relevant professional regulatory bodies.

Prescribed Learning Resources

Prescribed textbooks:

1. Levine N.D. (1999). Veterinary Protozoology, 1st Edition. Wiley-Blackwell. ISBN: 978-0813818610.
2. Taylor M.A., Coop R.L. & Wall R.L. (Eds). (2015). Veterinary Parasitology. Wiley – Blackwell, Oxford UK. 4th Edition 2015 (1,032 pages). ISBN: 978-0-470-67162-7

Additional resources:

1. http://www.afrivip.org/
2. https://www.cals.ncsu.edu/course/ent425/index.html (John R. Meyer, North Carolina State University)
3. http://www.merckvetmanual.com/mvm/index.html
4. http://labs.russell.wisc.edu/wisconsin-ticks/

Module Title: VETERINARY PROFESSIONAL SKILLS III	
Module Code	V3710EV
NQF Level	7
Notional Hours	10
Contact hours	Lectures: 1x 1hr lecture / week for 5 weeks
Additional learning requirements	None
NQF Credits	1
(Co-requisites) **Prerequisite**	None
Compulsory/Elective	Compulsory
Semester Offered	CS3

Module Purpose

The purpose of this module is to equip students on communication, from how to build your own brand to oral and written communication with individuals and groups, as well as body language, compassion and working in teams.

Overarching Learning Outcome

To develop life skills specific to a future career as a Veterinary Professional.

Specific Learning Outcomes

On completing the module students should be able to:

1. Illustrate lifelong learning and development by attending to their personal growth and start developing a personal brand
2. Use information, establish rapport, offer explanations, and describe changes in behavior, activity, and posture.
3. Use and convey information to stakeholders, clients and staff in a timely and effective manner, using both oral and written formats
4. Demonstrate working effectively individually or as a member of a health-care team, and able to tolerate physically and emotionally taxing workloads,
5. Explain the Cambridge-Calgary Consultation Model
6. Solve problems, a critical skill of veterinarians, requiring the ability to obtain, retrieve, analyse, integrate and synthesize information from multiple sources efficiently and accurately and arrive at a result
7. Show professionalism in a world of change

Module Content

Personal branding & purpose: Who am I? What do I contribute to the world?
Emotional Intelligence: Managing emotions; Compassion / burnout
Effective conflict management and interpersonal skills: Conflict styles
Effective communication: with colleagues, staff, seniors, health care teams
Client communication: Listening skills; Non-verbal communication
English writing skills for business: email; letters; reports; referrals
Professional behaviours: Good manners; Dress for success
Online presence: Social media; print and electronic media; public presentations
Problem solving: Flexibility and creative thinking; six thinking hats; lifelong learning
Compassion: Empathy; integrity; concern for others; collegiality
Cambridge-Calgary Consultation Model
A philosophical approach to addressing the following questions: How do professionals deal with work pressure and remain motivated? How is professionalism promoted and encouraged among professionals? How do professional fields control and empower their members?

Learning and Teaching Strategies/Activities

Blended teaching model through integrated lectures, real life simulations, case studies

Student Assessment Strategies

Continuous Assessment: 1 assignment for final CA mark (e.g. written assignment, group assignment, role-play and / or presentation).
Continuous participation assessment during compulsory lecture attendance.

Learning and Teaching Enhancement Strategies

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

Learning resources:

1. All required resources will be supplied to students in hard and/or soft copy, updated annually.

Module Title: ETHNO-VETERINARY MEDICINE	
Module Code	V3740AE
NQF Level	7
Notional Hours	40
Contact hours	Lectures: 2x 1hr lectures / week for 5 weeks Practical: 1x 3hr practical / alternate week for 5 weeks
Additional learning requirements	None
NQF Credits	4
(Co-requisites) **Prerequisite**	None
Compulsory/Elective	Compulsory
Semester Offered	CS3

Module Purpose

The purpose of the module is 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.

Overarching Learning Outcome

Discuss the importance of acquiring knowledge on ethno-veterinary practices for a veterinarian

Specific Learning Outcomes

On completing the module students should be able to:

1. Discuss the use of traditional medicine in different communities based on the locally available indigenous natural resources
2. 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
3. Discuss the advantages and disadvantages of Ethnoveterinary practices as it regards to the use of indigenous disease-prevention and treatment methods
4. Discuss the ethno-veterinary practices-contemporary relevance and conservation of bioresources, ethno-botany and pharmacognosy
5. Discuss the importance of the use of natural resources and remedies in the practice of ethno-veterinary medicine in relation to the different farming systems as complimentary and an alternative to conventional veterinary medicine in developing countries, particularly Namibia

6. Discuss the use of ethno-veterinary medicine and traditional remedies and how it fits within the different farming systems in the developing world and particularly in Namibia

Module Content

Indigenous Knowledge Systems (IKS) as related to the use and application of herbal and traditional medicines; identification, collection and preparation of medicinal plants
Collection, identification and classification of herbal/medicinal plants: identification and profiling of medicinal plant extracts.
Ethno-veterinary practices-contemporary relevance and conservation of bio-resources, ethno-botany and pharmacognosy.
Traditional Medicine Systems (TMS); 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; 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.

Learning and Teaching Strategies/Activities

Blended teaching model to facilitate the achievement of learning outcomes will include lectures, laboratory activities, a field assignment project and one or two field trips. Practical sessions will be shared with Toxicology mainly in the identification of plants which are toxic to animals.

Student Assessment Strategies

Continuous Assessment: minimum 2 theory assessments in a form of tests (each 100 marks); at least 3 marked practical assessments (each 20 marks) and one field project assignment (40 marks).

Learning and Teaching Enhancement Strategies

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

Learning resources:

1. Ngeh J Toyang; Hanneke Mertens; Sara van Otterloo-Butler (2007). Ethno veterinary medicine: a practical approach to the treatment of cattle diseases in sub-Saharan Africa; Technical Centre for Agricultural and Rural Cooperation (Ede, Netherlands); Agromisa (Organization), Wageningen: Agromisa; Wageningen: CTA, 2nd edition
2. Constance Marie McCorkle, Evelyn Mathias, T. W. Schillhorn-Van-Veen (1996). Ethno veterinary Research & Development**,** Intermediate Technology Publications
3. Constance M. McCorkle and Evelyn Mathias-Mundy (1992). Ethnoveterinary Medicine in Africa, Africa: Journal of the International African Institute, Vol. 62, No. 1 (1992), pp. 59-93 Publisher: Cambridge University Press

Module Title: CLINICAL DIAGNOSTICS	
Module Code	V3790CC
NQF Level	7
Notional Hours	90
Contact hours	Lectures: 6x 1hr lectures / week for 5 weeks Practical: 2x 3hr practical / alternate week for 5 weeks
Additional learning requirements	None
NQF Credits	9
(Co-requisites) **Prerequisite**	Veterinary Structure & Function III Veterinary Structure & Function IV (2024 only) Veterinary Biochemistry Animal Ethology Animal Welfare Veterinary Immunology & Vaccinology
Compulsory/Elective	Compulsory
Semester Offered	CS3

Module Purpose

The purpose of this module is to demonstrate and practice routine diagnostic and therapeutic procedures for the major domestic animal species. This module will also cover principles of clinical pathology and associated sampling procedures; and topographic anatomical foundations for common procedures including surgical procedures. The module will be mostly taught in a practical context.

Overarching Learning Outcome

Perform a clinical examination on an equine, bovine, canine, feline and caprine / ovine.

Specific Learning Outcomes

On completing the module students should be able to:

1. Perform a thorough clinical examination on canines, ruminants, and equines.
2. Use the POMR (problem oriented medical record) approach to arrive at a diagnosis.
3. Use specific medical terminology in veterinary medicine.
4. Describe selected clinical diagnostic sampling procedures.
5. Observe and / or perform basic diagnostic tests (eg blood smear, auscultation and palpation) as well as auxillary tests (eg diagnostic imaging, blood chemistry, hematology, urine and faecal analysis).
6. Demonstrate routes and equipment of medicine administration, both parenteral and non-parenteral.
7. Perform communication and interaction with clients in role-play simulations.
8. Identify topographical anatomical landmarks for common procedures including injection sites.

Module Content

Common diagnostic procedures used in key domestic animals
Thorough, systematic, species specific clinical examination
Principles of clinical pathology
Problem oriented medical record keeping
Communication to clients
Anatomical landmarks for injection sites
Principles and procedure of diagnostic decision making

Learning and Teaching Strategies/Activities

Blended teaching model through integrated lectures and practicals

Student Assessment Strategies

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

Learning and Teaching Enhancement Strategies

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 and tests

Learning resources:

1. MD Lorenz: Small Amimal Medical diagnosis: Wiley Blackwell
2. Jackson & Cockcroft. Clinical Examination of Farm Animals. Blackwell Science.
3. M. Schaer; Clinical Signs in Small Animal Medicine; CRC Press
4. Staschak : Adams Lameness in Horses; Lea and Febiger
5. Bosman: Medical Terminology for students: Van Schaik
6. Kirk: Current Veterinary therapy: Saunders

Module Title: INTRODUCTION TO JURISPRUDENCE	
Module Code	V3720AJ
NQF Level	7
Notional Hours	20
Contact hours	Lectures: 1x 1hr lectures / week for 5 weeks
Additional learning requirements	None
NQF Credits	2
(Co-requisites) **Prerequisite**	None
Compulsory/Elective	Compulsory
Semester Offered	CS3
Module Purpose	
The purpose of this module is to provide the student with an overview of public policy, the formulation of legislation and the Namibian Constitution	
Overarching Learning Outcome	
Discuss the formulation of policy and legislation in terms of the Namibian Constitution.	
Specific Learning Outcomes	
On completing the 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. Interpret the Constitution of the Republic of Namibia	

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 and the Namibian Constitution.

Learning and Teaching Strategies/Activities

Through lectures, tutorials, class discussions

Student Assessment Strategies

Continuous assessment 100%. Minimum 2 theory assessments

Learning and Teaching Enhancement Strategies

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

Learning resources:

All the below Learning Resources are prescribed and will be made available to the students at no cost

1. Veterinary and Veterinary Para-Professions Act 1 of 2013, including supporting Regulations and Rules
2. Animal Health Act 1 of 2011 including supporting Regulations
3. Medicines and Related Substances Control Act 13 of 2003 including supporting Regulations, as well as the Amendment Act
4. Prevention of Undesirable Residues in Meat Act 11 of 2009 including supporting Regulations
5. The Constitution of the Republic of Namibia

Module Title: **VETERINARY TOXICOLOGY I**	
Module Code	V3750AT
NQF Level	7
Notional Hours	50
Contact hours	Lectures and Practical: Integrated 7hrs / week for 5 weeks (5 full days)
Additional learning requirements	None
NQF Credits	5
(Co-requisites) **Prerequisite**	Veterinary Structure & Function III Veterinary Structure & Function IV (2024 only)
Compulsory/Elective	Compulsory
Semester Offered	CS3
Module Purpose	
The purpose of this module is to create a plant collection that will be a field based exercise with regular sessions to preserve and display collected plants, in the skills laboratory. Students will concentrate on toxic plants of importance to livestock in Namibia and prepare a collection that they can keep and refer to in the years to come. This collection will supplement Veterinary Toxicology II lectures in Semester 1 and 2.	
Overarching Learning Outcome	
Identify, collect and preserve toxic plants of Veterinary importance to the livestock industry in Namibia.	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Identify and collect at least 20 specimens of toxic plants of importance to livestock in Namibia 2. Preserve and display collected plants using botanically accepted methods	

Module Content

Identification, collection and preservation of toxic plants of importance to livestock in Namibia.

Learning and Teaching Strategies/Activities

Blended teaching model through integrated lectures, practicals and field trips

Student Assessment Strategies

Continuous Assessment: The final toxic plant collection will be assessed for the CA mark.

The collection will be used as reference material for Veterinary Toxicology II in Semesters 1 and 2.

Learning and Teaching Enhancement Strategies

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

Learning resources:

1. Kellerman, Coetzer, Naudé and Botha 2005. Plant poisonings and mycotoxicosis of livestock in southern Africa, Oxford University Press
2. Mannheimer and Marais: Toxic plants of veterinary importance in Namibia. Published by Ministry of Agriculture, available at the National Herbarium
3. Anipedia (available online at www.anipedia.org/)
4. Van Wyk, van Heerden, van Oudtshoorn. Poisonous Plants of South Africa, BRIZA publications
5. Hovda, Brutlag, Poppenga and Peterson. Small Animal Toxicology: WILEY BLACKWELL

Module Title: FISH AND BEE MEDICINE	
Module Code	V3750PF
NQF Level	7
Notional Hours	50
Contact hours	Lectures and Practical: Integrated 32hrs / week (1 full week)
Additional learning requirements	Full day field trips
NQF Credits	5
(Co-requisites) **Prerequisite**	Veterinary Microbiology I Veterinary Microbiology II
Compulsory/Elective	Compulsory
Semester Offered	CS3

Module Purpose

The purpose of this module is to familiarize students with the farming of fish and bees and their importance in Namibia and globally. Students are also taught some of the OIE listed diseases. As fish and bee diseases are fields of specialization this is only an introduction to stimulate thoughts and gain some basic understanding as veterinarians are often in evolved in import and export of animal products.

Overarching Learning Outcome

Apply knowledge of fish anatomy, fish and bee husbandry and health, focusing on diseases of economic importance.

Specific Learning Outcomes

On completing the 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. Apply the principles of health and production problems of fish and bees
3. Identify good management practices in fish conservation and medicine
4. Assess 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: overview of fish anatomy; fish husbandry; aetiology, diagnosis, pathology, pathogenesis, chemotherapy, control, and management of infectious and non-infectious diseases of fish, especially pertaining to cultured food and tropical fish; introduction to aquaculture; water quality; diagnostic approach in aquaculture; treatment approach in aquaculture.; fish diseases: fungal, bacterial, parasitic, toxic & viral; fish anatomy; fish anesthesia
Bee medicine: honeybee husbandry; aetiology, diagnosis, pathology, pathogenesis, control, and management of infectious and non-infectious diseases of bees; bee biology; bee beekeeping; bee diseases: bacterial bee diseases, fungal bee diseases, parasitic bee diseases, viral bee diseases, multifactorial and environmental syndromes.

Learning and Teaching Strategies/Activities

Integrated theory with practical over a week where students will be exposed and taught the basics around beekeeping and the diseases of fish and bees.

Field trips: Beehives will be visited; a trip to a suitable aquaculture facility will be undertaken to expose student to the industry.

Student Assessment Strategies

The module will only be assessed through formative assessments, with no final examination. The continuous assessments will comprise of a minimum 2 theory assessments/assignments, and at least 1 marked practical assessment

Learning and Teaching Enhancement Strategies

- Review of the module will be undertaken continuously, in consultation with other experts in the field.
- Lecturer/student evaluations will be done to provide feedback to lecturer with a view to enhancing the learning and teaching of the module.

Learning resources:

1. Guide to Bees & Honey, Ted Hooper. Introduction
2. Beekeeping in South Africa, third eddition, by R.H. Anderson, B. Buys and M.F. Johannsmeier
3. Aquaculture; Farming aquatic animals and Plants, John S. Lucas & Paul C Southgate

The following resources are available online free of charge:

1. Terrestrial animal health code chapter 4.14 and 9.1 to 9.6 http://www.oie.int/international-standard-setting/terrestrial-code/access-online/

2. Manual of diagnostic tests and vaccines for terrestrial animals Manual of diagnostic tests and vaccines for terrestrial animals: Varroa http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.02.07_VARROOSIS.pdf
3. Manual of diagnostic tests and vaccines for terrestrial animals Manual of diagnostic tests and vaccines for terrestrial animals: Acarapisosis http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.02.01_ACARAPISOSIS.pdf
4. Manual of diagnostic tests and vaccines for terrestrial animals Manual of diagnostic tests and vaccines for terrestrial animals: Amarican Foul brood (AFB) http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.02.02_AMERICAN_FOULBROOD.pdf
5. Manual of diagnostic tests and vaccines for terrestrial animals Manual of diagnostic tests and vaccines for terrestrial animals: European Foul brood (EFB) http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.02.03_EUROPEAN_FOULBROOD.pdf
6. Manual of diagnostic tests and vaccines for terrestrial animals Manual of diagnostic tests and vaccines for terrestrial animals: Nosemosis http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.02.04_NOSEMOSIS_FINAL.pdf
7. Manual of diagnostic tests and vaccines for terrestrial animals Manual of diagnostic tests and vaccines for terrestrial animals: Small Hive beetle http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.02.05_SMALL_HIVE_BEETLE.pdf
8. Manual of diagnostic tests and vaccines for terrestrial animals Manual of diagnostic tests and vaccines for terrestrial animals: Tropilaelaps http://www.oie.int/fileadmin/Home/eng/Health_standards/tahm/2.02.06_TROPILAELAPS.pdf

Module Title: INFECTIOUS DISEASES I	
Module Code	V3711AI
NQF Level	7
Notional Hours	170
Contact hours	Lectures: 4x 1hr lectures / week for 13 weeks Practical: 1x 3hr practical / alternate week for 13 weeks
Additional learning requirements	None
NQF Credits	17
(Co-requisites) **Prerequisite**	Veterinary Microbiology I Veterinary Microbiology II
Compulsory/Elective	Compulsory
Semester Offered	1

Module Purpose

The purpose of the module is to teach students to appreciate and understand infectious diseases caused by pathogenic bacteria and fungi encountered in domestic and wild animals. The laboratory component focuses on the isolation and identification of pathogenic bacteria and fungi as a basis for diagnosis and control of bacterial and fungal diseases of veterinary importance.

Overarching Learning Outcome

Discuss infectious diseases caused by pathogenic bacterial and fungal species belonging to different genera of bacteria and fungi affecting domestic and wild animals which affect the integumentary system (skin and wounds, eye and ear), the respiratory system, gastrointestinal tract, urinary tract, reproductive tract and nervous system with regards to the aetiology of the disease, distribution, hosts involved, transmission, vectors, pathogenesis, clinical signs, diagnosis, treatment and control with particular emphasis on zoonosis, notifiable and tropical diseases.

Specific Learning Outcomes

On completing this module students should be able to:

1. Discuss infectious diseases caused by pathogenic bacterial and fungal species belonging to different genera of bacteria and fungi affecting domestic and wild animals which affect the integumentary system (skin and wounds, eye and ear), the respiratory system, gastrointestinal tract, urinary tract, reproductive tract and nervous system with regards to the aetiology of the disease, distribution, hosts involved, transmission, vectors, pathogenesis, clinical signs, diagnosis, treatment and control with particular emphasis on zoonosis, notifiable and tropical diseases
2. Recognise the most important genera and species of pathogenic bacteria and fungi of veterinary importance

3. Describe pathogenic traits of bacteria and host defences as related to the aetiology of specific diseases
4. Identify a variety of types of pathogenic microorganisms and the diseases they produce and or associated with in different animal hosts including humans.
5. Describe the importance of mycotoxins and mycotoxicosis as related to veterinary public health
6. Distinguish between normal and pathogenic bacteria and fungi isolated from biological or clinical samples
7. Describe the mastitis syndrome and identify mastitis producing pathogens

Module Content

Aetiology, transmission, vectors, clinical signs, pathogenesis of bacterial and fungal diseases and the specific host defences.
Diagnosis of specific diseases based on isolation, biochemical tests, culture and staining of bacteria and fungi.
Treatment and control of notifiable and tropical diseases.

Learning and Teaching Strategies/Activities

Blended teaching model through lectures and laboratory activities.

Student Assessment Strategies

Continuous Assessment (CA) will entail a minimum of 2 theory assessments in a form of tests (each 100 marks) and at least 5 marked practical assessments (each 20 marks) and 2 assignments (each 10 marks).
CA [30% Theory and 10% (Practical+ Assignments)]

Examination: 1x 3hr theory paper

Learning and Teaching Enhancement Strategies

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
- Monitoring and evaluation by relevant professional regulatory bodies.

Prescribed Learning Resources

Prescribed textbooks:

1. P.J. Quinn, B.K. Markey, M.E. Carter, W.J.C. Donelly, F.C. Leonard (2002). Veterinary Microbiology and Microbial diseases. Blackwell Publishing.
2. G.R. Carter, Darla J. Wise (2004). Essentials of Veterinary Bacteriology and Mycology, Iowa State Press, Sixth Ed.
3. J.Glenn Songer and Karen W. Post (2005). Veterinary Microbiology: Bacterial and Fungal agents of Animal Diseases. Elsevier Saunders.

Additional resources:

1. P.J. Quinn and B.K. Markey (2003). Concise Review of Veterinary Microbiology.
2. P. J. Quinn, B. K. Markey, F. C. Leonard, P. Hartigan (Author), S. Fanning , E. S. Fitzpatrick. Veterinary Microbiology and Microbial Disease (2011). Wiley-Blackwell, 2nd ed.
3. Coetzer JAW and Tustin RC (2004). Infectious diseases of livestock. Volume three. Oxford University Press, 2nd Edition.
4. Bergey's Manual of Systemic Bacteriology

Module Title: VETERINARY PARASITOLOGY I	
Module Code	V3731AP
NQF Level	7
Notional Hours	170
Contact hours	Lectures: 4x 1hr lectures / week for 13 weeks Practical: 1x 3hr practical / alternate week for 13 weeks
Additional learning requirements	None
NQF Credits	17
(Co-requisites) **Prerequisite**	Veterinary Structure & Function III Veterinary Structure & Function IV (2024 only) Veterinary Biochemistry
Compulsory/Elective	Compulsory
Semester Offered	1

Module Purpose

The purpose of this module is to impart knowledge of helminths and helminthic diseases of veterinary significance in Namibia.

Overarching Learning Outcome

On completion of the module, students should have a clear understanding of all classes of helminths, their veterinary, economic and public health importance and be able to design and implement a proper control program for each helminth.

Specific Learning Outcomes

On completing the module students should be able to:

1. Recognize the various classes of parasites.
2. Describe the pathologic and economic effects of selected endoparasites.
3. Recommend methods and strategies for controlling or minimizing endoparasitic infection, both in the individual animal and on a herd basis.
4. Identify representative parasite 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

Introduction to general parasitology: terminology used in parasitology; general morphology, biology and general characteristics of various parasite classes.
General parasitology: parasites and parasitism; types of hosts; host-parasite relationships; mode of transmission of parasites; methods of dissemination of infective stages of parasites; 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, diagnosis; general control measures of trematodes, cestodes and nematodes of veterinary importance in the region; diagnosis, treatment and prevention of diseases caused by helminths; biological control of endoparasites.

Learning and Teaching Strategies/Activities

Blended teaching model through lectures, practical sessions and class discussions.

Student Assessment Strategies

Continuous assessment: Minimum of two (2) theory tests (total contribution of 60%), at least one (1) marked practical test (total contribution of 30%) and laboratory reports (total contribution of 10%).

Final examination: One (1) 3hr theory paper (150 marks) and one (1) practical 2hr paper.

Learning and Teaching Enhancement Strategies

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
- Monitoring and evaluation by relevant professional regulatory bodies

Prescribed Learning Resources

Prescribed textbooks:

1. Veterinary Helminthology, 2013. Mandal S.C. Satish Serial Publishing House. ISBN: 978-93-81226- 8-5.
2. Veterinary Parasitology, 2015. Taylor M.A., Coop R.L. & Wall R.L. (Eds). Wiley – Blackwell, Oxford UK. 4th Edition 2015 (1,032 pages). ISBN: 978-0-470-67162-7

Additional resources:

1. http://www.afrivip.org/
2. https://www.cals.ncsu.edu/course/ent425/index.html (John R. Meyer)
3. http://www.merckvetmanual.com/mvm/index.html
4. http://labs.russell.wisc.edu/wisconsin-ticks/

Module Title: VETERINARY PHARMACOLOGY	
Module Code	V3703AD
NQF Level	7
Notional Hours	180
Contact hours	Lectures: 2x 1hr lectures / week for 13 weeks per semester Tutorial: 1x 3hr tutorial or field trip / alternate week for 13 weeks per semester
Additional learning requirements	None
NQF Credits	18
(Co-requisites) **Prerequisite**	(Clinical Diagnostics) Veterinary Biochemistry Veterinary Structure & Function III Veterinary Structure & Function IV (2024 only)
Compulsory/Elective	Compulsory
Semester Offered	1 and 2 (year module)

Module Purpose

The purpose of this module is to expose students to the principles of fundamental pharmacology (pharmacotherapeutics, pharmacokinetics and pharmacodynamics), ethics, drug legislation, dosage calculations 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.

Overarching Learning Outcome

Discuss pharmacological principles and drugs as well as accurately calculate dosages of various formulations for various species.

Specific Learning Outcomes

On completing the module students should be able to:

1. Use pharmacological terms and abbreviations correctly.
2. Perform pharmacological conversions and calculations. A fatal flaw concept will be applied to dosage calculation.
3. Explain the methods of drug administration using appropriate routes in different animal species.
4. Discuss the basic concepts of legislation governing dispensing, record keeping and prescribing of veterinary drugs.
5. Discuss the processes of absorption, distribution, metabolism and excretion of drugs after administration, in different animal species and the factors affecting these processes.
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. Describe the classification, mechanism of action, pharmacological effects, indications for use, contra-indications, side and adverse effects and scheduling of the drugs affecting the central nervous system.
9. Describe the classification, mechanism of action, pharmacological effects, indications for use, contra-indications, side and adverse effects and scheduling of drugs affecting the various organ systems in the body, including topical drugs.
10. Discuss the rational use of antimicrobial agents.
11. Describe the classification, mechanism of action, pharmacological effects, indications for use, contra-indications, side and adverse effects and scheduling of the various classes of antimicrobial agents.
12. Describe the classification, mechanism of action, species or indications for use, contra-indications, side and adverse effects and scheduling of ecto- and endoparasitic remedies.
13. Explain how to combine some drugs safely.
14. Discuss the importance of withdrawal intervals of drugs, including the prevention of drug residues in food producing animals.

Module Content

Basic pharmacotherapeutic principles
Pharmacodynamics
Pharmacokinetics
Classification of drugs
Legal requirements for dispensing, prescribing and record keeping of veterinary drugs
Functional pharmacology
Chemotherapeutics
Systemic drugs acting on the various organ systems

Learning and Teaching Strategies/Activities

Blended teaching model through lectures, tutorials and field trips

Student Assessment Strategies

Continuous Assessment: Minimum 4 theory assessments as well as quizzes and assignments, pass dosage calculation evaluation.

Examination: 1 x 3hr theory paper

Learning and Teaching Enhancement Strategies

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

Prescribed Learning Resources

Prescribed textbooks:

1. Riviere, Jim E., et al (2018). Veterinary Pharmacology and Therapeutics. Hoboken, NJ: John Wiley & Sons Inc.
2. Plumb, Donald C. (2018). Plumb's Veterinary Drug Handbook. Stockholm, Wisconsin: PharmaVet Inc.

Additional resources:

1. Allerton, F. (2020). BSAVA Small Animal Formulary, Part A: Canine and Feline, 10th edition. Quedgeley, Gloucester: British Small Animal Veterinary Association
2. Boothe, D. (2012). Small Animal Clinical Pharmacology & Therapeutics. St. Louis, Mo.: Elsevier Saunders
3. Hsu, Walter H. (2013). Handbook of Veterinary Pharmacology. Ames, Iowa: Wiley-Blackwell Pub.
4. MIMS IDR (2021). Pretoria: MIMS

Module Title: GENERAL PATHOLOGY	
Module Code	V3723AG
NQF Level	7
Notional Hours	180
Contact hours	Lectures: 2x 1hr lectures / week for 13 weeks per semester Practical: 1x 3hr practical / alternate week for 13 weeks per semester
Additional learning requirements	None
NQF Credits	18
(Co-requisites) **Prerequisite**	Veterinary Structure & Function III Veterinary Structure & Function IV (2024 only) Veterinary Immunology & Vaccinology
Compulsory/Elective	Compulsory
Semester Offered	1 and 2 (year module)

Module Purpose

The purpose of this module is to introduce students to the general aspects of pathological diseases across a range of animal species.

Overarching Learning Outcome

On completion of the module, students should be able to describe the basic alterations that occur in the body as a result of disease and will be able to understand different disease mechanisms and outcomes. The module will provide students with a foundation to understanding diseases in different body systems.

Specific Learning Outcomes

On completing the module students should be able to:

1. Demonstrate knowledge of causes of disease in animals and interpret functional and structural changes in cells and tissues
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

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, inflammation and repair.
Lesions due to disturbance of growth and cell differentiation, genetic derangements, degenerative lesions and necrosis.
Lesions due to circulatory disturbances, hypersensitivity and aberrant immunological reactions.
Techniques used in post mortem examination.
Attend necropsies.

Learning and Teaching Strategies/Activities

Blended teaching model through lectures, tutorials, practical sessions and class discussions.

Student Assessment Strategies

Continuous Assessment: Minimum 4 (2 per semester) theory assessments (1hr - 60marks – each test count 30%) and at least 4 marked practical tests contributing to 30 % and 10% for post mortem reports.

Examination: 1 x 2hr practical examination and 1 x 3hr theory paper

Learning and Teaching Enhancement Strategies

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
- Monitoring and evaluation by relevant professional regulatory bodies.

Prescribed Learning Resources

Prescribed textbooks:

1. Zachary, J. F., & McGavin, M. D. (2013). Pathologic basis of veterinary disease. Elsevier Health Sciences.
2. Jubb, Kennedy & Palmer's Pathology of Domestic Animals, 6th Revised Edition, 2015. Publisher: Elsevier Health Sciences, London, United Kingdom; ISBN10: 0702053228 and ISBN13: 9780702053221

Additional resources:

1. Introduction to Veterinary Pathology, 3rd Edition by Norman F. Cheville, October 2006, ©2006, Publisher: Wiley-Blackwell, ISBN: 978-0-8138-2495-6
2. Robbins Basic Pathology. Philadelphia: Richard Sheppard; Kumar, Vinay; Abbas, Abul K.; Fausto, Nelson (2007). Saunders. ISBN 1-4160-2973-7. 8th edition
3. https://www.msdvetmanual.com/

Module Title: VETERINARY GENERAL SURGERY	
Module Code	V3701CS
NQF Level	7
Notional Hours	90
Contact hours	Lectures: 2x 1hr lectures / week for 13 weeks Practical: 1x 3hr practical / alternate week for 13 weeks
Additional learning requirements	None
NQF Credits	9
(Co-requisites) **Prerequisite**	Veterinary Structure & Function III Veterinary Structure & Function IV (2024 only)
Compulsory/Elective	Compulsory
Semester Offered	1

Module Purpose

The purpose of this module is to introduce students to the basic principles of veterinary general surgery, focusing on common domestic animals.

Overarching Learning Outcome

Understand the basic principles of veterinary general surgery, focusing on common domestic animals.

Specific Learning Outcomes

On completing the module students should be able to:

1. Differentiate between various surgical instruments, suture materials and suture patterns, and understand their use.
2. Apply selected haemostasis techniques to models or cadavers
3. Apply selected suture techniques to models or cadavers
4. Apply aseptic techniques in preparation of the theatre, surgeon and patient
5. Discuss and apply the use of various disinfectants and antiseptics, and understand their use.
6. Discuss the principles of traumatology, wound healing, wound infection, and wound management
7. Discuss the use of selected bandaging techniques

Module Content

Surgical instrumentation: basic soft tissue and orthopaedic instrumentation characteristics and use.
Surgical haemostasis: application of different method of haemostasis, including physical, electrosurgical, and pharmacological haemostasis.
Suture materials: various suture material characteristics and use.
Suture patterns and techniques: suture pattern classification and use.
Principles of asepsis: patient and surgeon preparation, including patient and surgeon scrubbing, gowning, gloving, draping, and Halsted principles.
Disinfectants, antiseptics and sterilization: various disinfectant and antiseptic characteristics and use, as well as methods of sterilization.
Traumatology: introduction to the surgical principles of traumatology.
Wound healing: stages of wound healing and associated complications.
Wound infection: detection, treatment and prevention of surgical wound infection.
Wound management: wound evaluation, lavage, debridement, drainage, and closure.
Bandaging: bandage materials, composition, principles, and complications, as well as various types and use.

Learning and Teaching Strategies/Activities

Blended teaching model through lectures, practicals and case studies. Lectures can be delivered face-to-face or online.

Student Assessment Strategies

Continuous assessment: Minimum of 2 theoretical assessments and 1 marked practical assessment.

Examination: 1 x 2 hour integrated theory paper.

Learning and Teaching Enhancement Strategies

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 review of module content.
- Effective supervision and monitoring of assignments, tests and examinations.

Prescribed Learning Resources

Prescribed textbook:

1. Fossum, TW, et al. 2018, Small Animal Surgery, 5th edn, Elsevier.

Additional resources:

1. Tobias, KM & Johnston, SA 2018, Veterinary Surgery: Small Animal, 2nd edn, Elsevier.

Module Title: VETERINARY TOXICOLOGY II	
Module Code	V3743AT
NQF Level	7
Notional Hours	160
Contact hours	Lectures: 2x 1hr lectures / week for 13 weeks
Additional learning requirements	None
NQF Credits	16
(Co-requisites) **Prerequisite**	(Veterinary Toxicology I) Veterinary Biochemistry Veterinary Structure & Function III Veterinary Structure & Function IV (2024 only)
Compulsory/Elective	Compulsory
Semester Offered	1 and 2 (year module)

Module Purpose

The purpose of this module is to expose students to toxicology, which 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.

Overarching Learning Outcome

Recognise toxic plants, chemicals and zootoxins, which commonly affect animals, including diagnosis and treatment of affected animals.

Specific Learning Outcomes

On completing the 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, heamopoetic 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, heamopoetic 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

Nature, effects and detection of various types of poison and poisoning
Treatment of poisoning
Identification, habitat, and phenology of relevant toxic plants of importance in the livestock industry in Namibia
Effects of relevant toxic plants on various species, economic importance, and treatment

Learning and Teaching Strategies/Activities

Blended teaching model through lectures and assignments.

Student Assessment Strategies

Continuous Assessment: Minimum 2 theory assessments per semester

Examination: 1 x 1hr practical examination to identify toxic plants and other poisons and 1 x 3hr theory paper.

The toxic plant collection from Core Semester will be used as reference material for Veterinary Toxicology in Semesters 1 and 2; and will form part of the practical examination (together with inorganic toxins).

Learning and Teaching Enhancement Strategies

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 all examination papers and answer scripts
- Student evaluation of the module and lecturers at the end of the semester

Prescribed Learning Resources

Prescribed textbooks:

1. Mannheimer and Marais: Toxic plants of veterinary importance in Namibia. Published by Ministry of Agriculture, available at the National Herbarium
2. Kellerman, Coetzer, Naudé and Botha (2005). Plant poisonings and mycotoxicosis of livestock in southern Africa, Oxford University Press

Additional resources:

1. Van Wyk, van Heerden, van Oudtshoorn. Poisonous Plants of South Africa, BRIZA publications
2. Anipedia (available online at www.anipedia.org/)
3. Hovda, Brutlag, Poppenga and Peterson. Small Animal Toxicology: WILEY BLACKWELL

Module Title: HERD HEALTH MANAGEMENT & ECONOMICS I (2023 only)	
Module Code	V3741PH
NQF Level	7
Notional Hours	90
Contact hours	Lectures: 2x 1hr lectures / week for 13 weeks Practical: 1x 3hr practical / alternate week for 13 weeks
Additional learning requirements	Feedlot challenge and full day field trips
NQF Credits	9
(Co-requisites) **Prerequisite**	Veterinary Immunology & Vaccinology Animal Production
Compulsory/Elective	Compulsory
Semester Offered	1

Module Purpose

The purpose of this module is to introduce 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.

Overarching Learning Outcome

Apply principles of heard health and reproductive management in order to optimise production in beef cattle and small stock.

Specific Learning Outcomes

On completing the module students should be able to:

1. Identify factors contributing to poor health and production, bovines small stock
2. Discuss the importance of body condition scoring in evaluating herd & 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. Explain the importance of keeping proper herd health records
8. Discuss the economic importance and contribution of the livestock sector in the Namibian economy
9. Analyse 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: aspects of herd/flock health, production and reproduction management programmes in cattle and small stock; management of replacement rearing, milk production, herd fertility, and nutrition in cattle; flock health, nutrition and production management of small stock; biosecurity measures and the containment of diseases.
Animal Health Economics: importance of animal diseases in efficiency of animal production; consumer's perception of animals and animal products; global trade; analysis of economic problems using basic methods such as partial budgeting, cost- benefit analysis and decision analysis; critical steps in systems analysis and appropriate modelling types and techniques, e.g. headmaster; implementation and evaluation of animal health programmes; policy development and implementation process.

Learning and Teaching Strategies/Activities

Blended teaching model through integrated lectures and practicals or field trips and participate in feedlot challenge.

Student Assessment Strategies

Minimum 2 theory assessments through written test (30% each), 3 marked practical assessments (40%) for CA Mark.

Examination: 1x 2hr theory paper

Learning and Teaching Enhancement Strategies

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

Prescribed Learning Resources

Prescribed textbooks:

1. Chenoweth PJ, Saunderson M W 2005 Beef practise: Cow-calf production medicine. Blackwell publishing
2. Herd Heath, Food Animal Production Medicine, 3rd Edition; Radostits OM

Additional resources:

1. Herd Heath, Food Animal Production Medicine, 2nd Edition; Radostits Leslie Fetrow
2. Fields MJ, Sand R J(Eds) 1994 Factors affecting calf crop.CRC Press
3. Small Stock Diseases: De Wet JAL & Bath GF
4. Diseases and Parasites of Cattle, Sheep and Goats in South Africa. P Oberem D Odendaal PT Oberem MGS Snyman L Ludwig H Mynhardt
5. Vaccines and Immunisation of Farm Animals; Jan du Preez and Faffa Malan.
6. Veterinary Medicine: Blood DC, Radostits OM & Henderson JA,6th edition
7. University of Pretoria: Veterinary Science: BHP 500 notes

Module Title: VETERINARY PARASITOLOGY II	
Module Code	V3732AP
NQF Level	7
Notional Hours	170
Contact hours	Lectures: 4x 1hr lectures / week for 13 weeks Practical: 1x 3hr practical / alternate week for 13 weeks
Additional learning requirements	None
NQF Credits	17
(Co-requisites) **Prerequisite**	(Veterinary Parasitology I) Veterinary Structure & Function III Veterinary Structure & Function IV (2024 only) Veterinary Biochemistry
Compulsory/Elective	Compulsory
Semester Offered	2

Module Purpose

The purpose of this module is to impart knowledge of ectoparasites of veterinary significance and veterinary important pathogens (protozoa and rickettsia) and the diseases they transmit.

Overarching Learning Outcome

On completion of the module, students should have a clear understanding of all classes of ectoparasites, protozoa and rickettsia, their veterinary, economic and public health importance and be able to design and implement a proper control program for each of the identified parasites.

Specific Learning Outcomes

On completing the 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 clinically relevant genera/species of protozoa and rickettsiae including the role of their vectors respectively intermediate hosts.
3. Describe relevant disease manifestations of protozoan/rickettsial and ectoparasitic diseases in the animal host species (livestock as well as companion animals and wildlife).
4. Discuss the economic effects and public health implications of selected protozoan/rickettsial diseases and ectoparasitic infestations.
5. Recommend methods and strategies for control, prevention or minimizing protozoon/rickettsial infection and ectoparasitic infestations, both in the individual animal and on a herd basis.

6. Identify representative protozoon/rickettsial and ectoparasite species using laboratory and field techniques, recommend further appropriate diagnostic laboratory methods.
7. 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

Entomology: classification of veterinary ectoparasites (e.g., mosquitoes, biting flies, fleas, lice, ticks and mites) relevant to Namibia and southern Africa; morphology and biology of various arthropod ectoparasites; life cycle and diagnosis of selected species;; parasitic role of different ectoparasites and their economic impact and human impact; vector role of different ectoparasites and/or intermediate hosts of protozoan/rickettsial diseases; control methods for ectoparasites including role and importance of biological control methods and chemical control and its effects on the environment; emergence of drug resistance and ways of mitigating resistance emergence.
Protozoology & Rickettsia: classification of protozoa and rickettsia; pathogenesis, pathology and clinical signs associated with various specific genera and/or species; diagnosis of different genera and/or species; control of different protozoa and rickettsia; use of vector control as a method of controlling specific protozoa and/or rickettsia.

Learning and Teaching Strategies/Activities

Blended teaching model through lectures, practical sessions and class discussions.

Student Assessment Strategies

Continuous assessment: Minimum of two (2) theory tests (total contribution of 60%), at least one (1) marked practical test (total contribution of 30%) and laboratory reports (total contribution of 10%).

Final examination: One (1) theory paper (150 marks) and one 2hr practical paper

Learning and Teaching Enhancement Strategies

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
- Monitoring and evaluation by relevant professional regulatory bodies.

Prescribed Learning Resources

Prescribed textbooks:

1. Levine N.D. (1999). Veterinary Protozoology, 1st Edition. Wiley-Blackwell. ISBN: 978-0813818610.
2. Taylor M.A., Coop R.L. & Wall R.L. (Eds). (2015). Veterinary Parasitology. Wiley – Blackwell, Oxford UK. 4th Edition 2015 (1,032 pages). ISBN: 978-0-470-67162-7

Additional resources:

1. http://www.afrivip.org/
2. https://www.cals.ncsu.edu/course/ent425/index.html (John R. Meyer, North Carolina State University)
3. http://www.merckvetmanual.com/mvm/index.html
4. http://labs.russell.wisc.edu/wisconsin-ticks/

Module Title: INFECTIOUS DISEASES II	
Module Code	V3712AI
NQF Level	7
Notional Hours	170
Contact hours	Lectures: 4x 1hr lectures / week for 13 weeks Practical: 1x 3hr practical / alternate week for 13 weeks
Additional learning requirements	None
NQF Credits	17
(Co-requisites) **Prerequisite**	(Infectious Diseases I) Veterinary Microbiology I Veterinary Microbiology II
Compulsory/Elective	Compulsory
Semester Offered	2

Module Purpose

The purpose of this module is to provide students with an overview of viral and prion infectious diseases which have a significant economic and zoonotic impact and how to identify and control them. Specific emphasis will be placed on those found in Namibia.

Overarching Learning Outcome

Upon completion of this module students should be able to describe viral diseases of veterinary importance; and explain the role of the veterinarians in the management and control of these diseases, with a particular emphasis on zoonotic viral and prion diseases, as well as viral diseases of domestic and farm animals that are present in Namibia or are at risk of introduction.

Specific Learning Outcomes

On completing the 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 prion disease of veterinary importance.

Module Content

Virus families of veterinary importance: associated diseases in different animal species; aetiology, pathogenicity, pathogenesis, clinical signs, diagnosis, prevention and control
Prions and prion diseases.

Learning and Teaching Strategies/Activities

Blended teaching model through lectures, laboratory activities, assignments, tutorials and class discussions.

Student Assessment Strategies

Continuous Assessment (CA) will entail a minimum of 2 theory assessments in a form of tests (each 100 marks) and at least 5 marked practical assessments (each 20 marks) and 2 assignments (each 10 marks).

CA [30% Theory and 10% (Practical+ Assignments)]

Examination: 1 x 3hr theory paper

Learning and Teaching Enhancement Strategies

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
- Monitoring and evaluation by relevant professional regulatory bodies.

Prescribed Learning Resources

Prescribed textbooks:

1. N. Maclachlan, Edward J Dubovi (Editors), Fenner's Veterinary Virology (2016), 5th Edition,
2. Coetzer JAW and Tustin RC (2004). Infectious diseases of livestock. Volume three. Oxford University Press, 2nd Edition.

Additional resources:

1. P.J. Quinn and B.K. Markey (2003). Concise Review of Veterinary Microbiology.
2. P.J. Quinn, B.K. Markey, M.E. Carter, W.J.C. Donelly, F.C. Leonard (2002). Veterinary Microbiology and Microbial diseases. Blachwell Publishing
3. JAW Coetzer, GR Thomson, NJ Maclachlan and ML Penrith (2020). Infectious Diseases of Livestock. Anipedia

Module Title: VETERINARY ANAESTHESIOLOGY	
Module Code	V3702CA
NQF Level	7
Notional Hours	90
Contact hours	Lectures: 2x 1hr lectures / week for 13 weeks Practical: 1x 3hr practical / alternate week for 13 weeks
Additional learning requirements	None
NQF Credits	9
(Co-requisites) **Prerequisite**	Veterinary Structure & Function III Veterinary Structure & Function IV (2024 only)
Compulsory/Elective	Compulsory
Semester Offered	2

Module Purpose

The purpose of this module is to teach skills to perform a preoperative examination, design an anaesthetic plan, administer local- or general anaesthesia, monitor the animals during anaesthesia and manage anaesthetic emergencies in domestic animals.

Overarching Learning Outcome

Perform a preoperative examination, design an anaesthetic plan and monitor anaesthetized animals.

Specific Learning Outcomes

On completing the module students should be able to:

1. Explain the general principles of anaesthesia.
2. Explain the drugs used as preoperative medication and calculate their doses for specific patients.
3. Explain the drugs used for intravenous induction and maintenance of anaesthesia.
4. Explain the drugs used for inhalation anaesthesia.
5. Describe the techniques used in intravenous- and inhalation induction of anaesthesia.
6. Classify and discuss inhalation anaesthetic systems.
7. Describe tracheal intubation principles in domestic species.
8. Explain principles of monitoring during anaesthesia.
9. Describe techniques and drugs used in local anaesthesia.
10. Explain the principles and design protocols for pain management.
11. Describe the diagnosis and management of common anaesthetic complications.
12. Formulate anaesthetic protocols for small and large animals.

Module Content

The anaesthetist's role for safe anaesthetic management of patients using injectable and inhalation anaesthetics: patient evaluation; selection and knowledge of premedication, induction and maintenance anaesthetic drugs; anaesthetic equipment; monitoring depth of anaesthesia; physiologic function.
Species-specific differences in drug and equipment choices/requirements.

Learning and Teaching Strategies/Activities

Blended teaching model through lectures, case studies and practicals.

Student Assessment Strategies

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

Examination: 1 x 2 hour theory paper

Learning and Teaching Enhancement Strategies

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

Prescribed Learning Resources

Prescribed textbooks:

1. Veterinary Anaesthesia: Principles to Practice. Ed. Dugdale. 2010. Wiley Blackwell
2. BSAVA Manual of Canine and Feline Anaesthesia and Analgesia, 3rd Edition. 2013 Ed. Duke-Novakovski

Additional resources:

1. Veterinary Anaesthesia, 11th Edition. Ed Clarke
2. DVM360 Magazine, http://veterinarymedicine.dvm360.com/veterinary-medicine-essentials-anesthesia

Module Title: VETERINARY DIAGNOSTIC IMAGING	
Module Code	V3722CD
NQF Level	7
Notional Hours	90
Contact hours	Lectures: 2x 1hr lectures / week for 13 weeks Practical: 1x 3hr practical / alternate week for 13 weeks
Additional learning requirements	None
NQF Credits	9
(Co-requisites) **Prerequisite**	(Clinical Diagnostics) Veterinary Structure & Function III Veterinary Structure & Function IV (2024 only)
Compulsory/Elective	Compulsory
Semester Offered	2
Module Purpose	
The purpose of this module is to introduce students to the basic principles of veterinary diagnostic imaging, including radiography and ultrasound, focusing on common domestic animals.	
Overarching Learning Outcome	
Understand the basic principles of veterinary diagnostic imaging, focusing on common domestic animals.	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Use a digital radiography- and ultrasound machine. 2. Discuss the principles and use of diagnostic imaging (including radiography and ultrasound), including radiations safety. 3. Explain patient positioning, including terminology, for various radiographic views. 4. Discuss radiographic and ultrasonographic interpretation, including recognising species differences and artefacts. 5. Recognise the major abdominal organs using ultrasound. 6. Explain the use of contrast media procedures.	

Module Content

Radiographic and ultrasound machines: the components, functions, and use of a radiographic and ultrasound machine, respectively.
Radiation safety: measures of radiation; exposure; and radiation protection.
Principles of radiography: overview of the general principles related to radiography; including collimation; grids; intensifying screens; radiographic film; film processing; quality evaluation; contrast resolutions; and technique charts.
Radiographic positioning and species differences: positioning techniques and radiography species differences, including those related to the thorax, abdomen and musculoskeletal system.
Radiographic interpretation: radiographic opacity; radiographic geometry; radiographic perception; and systematic evaluation of soft tissue and bone opacity changes.
Principles of ultrasonography: overview of the general principles related to ultrasonography; including attenuation; resolution; transducers; and interpretation of echogenicity.
Abdominal ultrasonography: approach to conducting a basic abdominal ultrasound scan.
Contrast media and techniques: classification and use of contrast media procedures.
Introduction to digital radiography, computed tomography, magnetic resonance imaging, nuclear medicine, dental radiography, and echocardiography: overview of different diagnostic imaging modalities.

Learning and Teaching Strategies/Activities

Blended teaching model through lectures, practicals and case studies. Lectures can be delivered face-to-face or online.

Student Assessment Strategies

Continuous assessment: Minimum of 2 theoretical assessments and 1 marked practical assessment.

Examination: 1 x 2 hour integrated theory paper.

Learning and Teaching Enhancement Strategies

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 review of module content.
- Effective supervision and monitoring of assignments, tests and examinations.

Prescribed Learning Resources

Prescribed textbook:

1. Thrall, DE, et al. 2013, Textbook of Veterinary Diagnostic Imaging, 6th edn, Elsevier.

Additional resources:

1. McConnel, JF & Holloway, A 2014, BSAVA Manual of Canine and Feline Radiography and Radiology, BSAVA.

Module Title: HERD HEALTH MANAGEMENT & ECONOMICS II (2023 only)	
Module Code	V3742PH
NQF Level	7
Notional Hours	90
Contact hours	Lectures: 2x 1hr lectures / week for 13 weeks Practical: 1x 3hr practical / alternate week for 13 weeks
Additional learning requirements	Full day field trips
NQF Credits	9
(Co-requisites) **Prerequisite**	Veterinary Immunology & Vaccinology Animal Production
Compulsory/Elective	Compulsory
Semester Offered	2

Module Purpose

The purpose of this module is to introduce principles of herd health and reproductive management, to optimize production and health in dairy cattle. Biosecurity measures will also be addressed. It similarly aims to explain the role animal health economics in the decision-making processes.

Overarching Learning Outcome

Apply principles of heard health and reproductive management in order to optimise production in dairy cattle.

Specific Learning Outcomes

On completing the module students should be able to:

1. Identify factors contributing to poor health and production, dairy cattle
2. Explain the importance of body condition scoring in evaluating herd performance
3. Recommend management strategies for new born animals, weaners and adults
4. Discuss factors and recommend management strategies for controlling mastitis in herds.
5. Discuss the objective of dry period management in the production cycle of cows
6. Determine metabolic diseases based on rumen activity
7. Evaluate herd fertility performance based on different parameters
8. Evaluate feeding strategies and ration balancing in relation to negative energy balance minimization in dairy cattle
9. Recommend correct biosecurity measures to ensure optimum health of livestock
10. Explain the importance of keeping proper herd health records
11. Recommend methods of hoof management
12. Discuss economic importance and contribution of the livestock sector in the Namibian economy

13. Analyse economic problems using basic methods such as partial budgeting, cost-benefit analysis and decision analysis
14. Evaluate gynaecological herd health records
15. Discuss the advantages and disadvantages of different dairy parlor types and the operation of milking machines
16. Recommend correct biosecurity measures to ensure optimum health of livestock

Module Content

Herd Health Management: herd health, production and reproduction management programmes in dairy cattle; management of replacement rearing, dry period, milk production, herd fertility, udder health, lactation, nutrition and body condition scoring; biosecurity measures and the containment of diseases; management strategies for newborn animals, weaners and adults; management of metabolic disease conditions, hoof problems and mastitis; record keeping and gynaecological herd health; different parlour types and milking machines
Animal Health Economics: Economic~~al~~ aspects of the dairy herd and productivity schemes; economic importance and contribution of the dairy sector in the Namibian economy.

Learning and Teaching Strategies/Activities

Blended teaching model through integrated lectures and practicals or field trips

Student Assessment Strategies

Minimum 2 theory assessments through written test (30% each), 3 marked practical assessments (40%) for CA Mark.

Examination: 1 x 2hr theory paper.

Learning and Teaching Enhancement Strategies

The quality and standards of learning and teaching will be improved through:

- Module review in consultation with experts
- Internal and external moderation of examination papers
- Lecturer and student evaluation or the module at the end of the semester
- Regular reviews of module content
- Effective supervision and monitoring of assignments, test and examinations

Prescribed Learning Resources

Prescribed textbooks:

1. Dairy herd Health, Martin Green.
2. Herd Heath, Food Animal Production Medicine, 3RD Edition; Radostits OM

Additional resources:

1. Herd Heath, Food Animal Production Medicine, 2ND Edition; Radostits Leslie Fetrow
2. Diseases and Parasites of Cattle, Sheep and Goats in South Africa. P Oberem D Odendaal PT Oberem MGS Snyman L Ludwig H Mynhardt
3. Vaccines and Immunisation of Farm Animals; Jan du Preez and Faffa Malan.
4. Veterinary Medicine : Blood DC, Radostits OM & Henderson JA,6th edition
5. University of Pretoria: Veterinary Science: BHP notes

Module Title: VETERINARY PROFESSIONAL SKILLS IV	
Module Code	V3830EV
NQF Level	8
Notional Hours	30
Contact hours	Lectures: 4x 1hr lectures / week for 6 weeks
Additional learning requirements	None
NQF Credits	3
(Co-requisites) **Prerequisite**	None
Compulsory/Elective	Compulsory
Semester Offered	CS4

Module Purpose

The purpose of this module is to develop important skills, knowledge and attributes required by the veterinarian as a professional. The emphasis will be on developing the following skills: a general understanding of private business management and business enterprise skills, including disease reporting to the relevant competent authorities.

Overarching Learning Outcome

To develop life skills specific to a future career as a Veterinary Professional.

Specific Learning Outcomes

On completing the module students should be able to:

1. Differentiate between business management and human resource management and management and leadership
2. Explain how to utilize and develop employees
3. Discuss pertinent aspects of the the Namibian Labour Law
4. Plan the establishment of a new veterinary clinic including the identification of required resources
5. Develop a private veterinary clinic business management programme
6. Compile an annual budget for a veterinary clinic and control finances
7. Define and evaluate high ethical and professional standards

Module Content

Business management: human resource management
Business strategy and annual planning: goal setting; budgeting
Management and Leadership: leadership styles
Employee management: performance management, goal setting; appraisals; motivation; training & development, career management
Namibian Labour Law: high level overview; managing labour relations
Organisational change management
Disease reporting to relevant competent authorities (MOHSS and MAWLR).
Veterinary ethics

Learning and Teaching Strategies/Activities

Blended teaching model through integrated lectures, real life simulations, case studies

Student Assessment Strategies

Continuous Assessment: Minimum 2 assessments and 2 assignments for final CA mark (e.g. written assignment, group assignment, role-play and / or presentation).
Continuous participation assessment during compulsory lecture attendance.

Learning and Teaching Enhancement Strategies

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

Learning resources

1. All required resources will be supplied to students in hard and/or soft copy, updated annually.

Module Title: FIELD PRACTICAL TRAINING: LABORATORY	
Module Code	V3810AL
NQF Level	8
Notional Hours	10
Contact hours	Lectures and Practical: Integrated 4hrs / week for 4 weeks
Additional learning requirements	None
NQF Credits	1
(Co-requisites) **Prerequisite**	Veterinary Microbiology I Veterinary Microbiology II Veterinary Parasitology I Veterinary Parasitology II Veterinary Toxicology II General Pathology Molecular Biology
Compulsory/Elective	Compulsory
Semester Offered	CS4

Module Purpose

The purpose of this module is to assist veterinary students to become acquainted with the National Veterinary laboratory setup and the different types of diagnostic tests carried out therewith. It enables learners to contextualize the theoretical knowledge acquired in modules like microbiology, immunology, parasitology, infectious diseases, pathology, and toxicology.

Overarching Learning Outcome

Upon completion of this module students should be acquainted with the different sections of the Central veterinary laboratory and be introduced to different services rendered in each of them; this information will help these future veterinarians not only to acquire practical knowledge, but also to consider this laboratory as a possible carrier opportunity or/and use its services.

Specific Learning Outcomes

On completion of this module students should be able to:

1. Describe the organization and function of the central veterinary laboratory
2. Explain the veterinary laboratory quality assurance
3. Explain the reception of samples and processing for different tests performed at CVL
4. Discuss the setup of different diagnostic laboratories at CVL and describe the equipment and tests performed there in

Module Content

Quality assurance

CVL departments: Clinical microbiology, Serology, Biotechnology, Food hygiene section, Toxicology and residue analysis, Pathology (Parasitology, Histopathology and Rabies)

Learning and Teaching Strategies/Activities

Students will be divided into two groups as suggested by the CVL Training Coordinator. While in the laboratory, all students should rotate in different sections where they will be introduced to different section. They will follow an explanatory power point presentation in each section, followed by the demonstration of the procedures and methods

Student Assessment Strategies

Each student fill in a logbook and the section supervisor assesses the student using a rubric prepared by the module coordinator out of 100. The report (logbook) is further assessed by the module coordinator who gives it an academic mark. This mark constitutes 60% against 40% of the marks by the section supervisor. The student will receive a calculated final mark based on these criteria. There is no exam for this module.

Learning and Teaching Enhancement Strategies

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 assessments (Discussions, presentations and assignments).

Learning resources:

1. Brianne Bellwood, Melissa Andrasik-Catton (2014). Veterinary technician's handbook of laboratory procedures Ames, Iowa, USA: Wiley Blackwell: 182 pages.
2. Margi Sirois, Charles M Hendrix (2015). Laboratory procedures for veterinary technicians. St. Louis, Missouri: Elsevier; 6th ed.: 440 pages.
3. P.J. Quinn and B.K. Markey (2003). Concise Review of Veterinary Microbiology.

Module Title: CLINICAL PATHOLOGY	
Module Code	V3890CC
NQF Level	8
Notional Hours	90
Contact hours	Lectures: 3x 1hr lectures / week for 6 weeks Practical: 2x 3hr practical / week for 6 weeks
Additional learning requirements	None
NQF Credits	9
(Co-requisites) **Prerequisite**	Clinical Diagnostics Veterinary Parasitology I Veterinary Parasitology II
Compulsory/Elective	Compulsory
Semester Offered	CS4

Module Purpose

The purpose of this module is to introduce students to laboratory-based diagnosis of veterinary diseases, including sampling, analysis and interpretation, with focus on common domestic animals.

Overarching Learning Outcome

Demonstrate laboratory-based diagnosis of veterinary diseases, including sampling, analysis and interpretation, with focus on common domestic animals.

Specific Learning Outcomes

On completing the module students should be able to:

1. Take samples from live animals, cadavers or models.
2. Make and stain a blood smear from a venous EDTA blood sample.
3. Perform a complete urinalysis.
4. Perform a urine dipstick test.
5. Collect, prepare, stain, examine, and interpret a fine needle aspirate and impression smear of a lymph node, organ or soft tissue mass.
6. Collect, prepare, stain, examine and interpret a cytobrush (cotton swab) samples from the eye, nose, or vagina.
7. Apply different staining techniques to various specimens, including blood smears, cytology specimens and urine sediment.
8. Observe the use of automated haematology and biochemistry analysers and discuss interpretation of results.

Module Content

Haematology: sample collection; preparation; and interpretation of results for routine haematology; including blood smear preparation and evaluation; and interpretation of a complete blood count.
Cytology: sample collection; preparation; and systematic approach to evaluation of cytological samples; Discussions include cytology of the lymph nodes, liver, and body cavity fluids; as well as cytological characteristics of neoplasia.
Biochemistry: sample collection; preparation; and interpretation of results for routine biochemistry related to various organs systems; including the kidneys, liver and pancreas; Discussions include interpretation of enzymes, proteins, electrolytes, minerals and ketone bodies.
Urinalysis: sample collection; preparation; and interpretation of results for routine urinalysis, including organoleptic test, determination of urine specific gravity; urine dipstick analysis; and sediment evaluation; interpretation of proteinuria.

Learning and Teaching Strategies/Activities

Blended teaching model through lectures, practicals and case studies. Lectures can be delivered face-to-face or online.

Student Assessment Strategies

Continuous assessment: Minimum of 2 theoretical assessments and 1 marked practical assessment. The final continuous assessment mark will constitute a weighting of 100% of the final mark.

Learning and Teaching Enhancement Strategies

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 review of module content.
- Effective supervision and monitoring of assignments, tests and examinations.

Learning resources:

1. Villiers E & Ristic J 2016, BSAVA Manual of Canine and Feline Clinical Pathology, 3rd edn, BSAVA.
2. Thrall MA, et al. 2012, Veterinary Haematology and Clinical Chemistry, 2nd edn, Wiley-Blackwell.
3. Stockham SL & Scott MA 2008, Fundamentals of Veterinary Clinical Pathology, 2nd edn, Blackwell.
4. Latimer, KS 2011, Duncan & Prasse's Veterinary Laboratory Medicine – Clinical Pathology, 5th edn, Wiley-Blackwell.
5. http://www.eclinpath.com

Module Title: APPLIED DIAGNOSTIC IMAGING	
Module Code	V3810CD
NQF Level	8
Notional Hours	10
Contact hours	Practical: 1x 3hr practical / alternate week for 6 weeks
Additional learning requirements	None
NQF Credits	1
(Co-requisites) **Prerequisite**	Veterinary Diagnostic Imaging
Compulsory/Elective	Compulsory
Semester Offered	CS4
Module Purpose	
The purpose of this module is to apply the basic principles of veterinary diagnostic imaging, including radiography and ultrasound, focusing on common domestic animals.	
Overarching Learning Outcome	
Apply the basic principles of veterinary diagnostic imaging, focusing on common domestic animals.	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Use a digital radiography- and ultrasound machine. 2. Discuss the principles and use of diagnostic imaging (including radiography and ultrasound), including radiations safety. 3. Explain patient positioning, including terminology, for various radiographic views. 4. Discuss radiographic and ultrasonographic interpretation, including recognising species differences and artefacts. 5. Recognise the major abdominal organs using ultrasound.	

Module Content

Practical on radiography- and ultrasound machines, and radiation safety: application and use of a radiography- and ultrasound machine respectively, as well as application of radiation safety.
Practical on radiographic positioning and interpretation: application of different positioning techniques, including those related to the thorax and abdomen, as well as discussion of radiographic interpretation.
Practical on abdominal ultrasonography and interpretation: conduct an abdominal ultrasound scan on a dog and interpret the images, including discussion of ultrasound principles and artefacts.

Learning and Teaching Strategies/Activities

Through practical sessions

Student Assessment Strategies

Continuous assessment: Minimum of 1 marked practical assessment.
The final continuous assessment mark will constitute a weighting of 100% of the final mark.

Learning and Teaching Enhancement Strategies

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 review of module content.
- Effective supervision and monitoring of assignments, tests and examinations.

Learning resources:

1. Thrall, DE, et al. 2013, Textbook of Veterinary Diagnostic Imaging, 6th edn, Saunders Elsevier.
2. McConnel, JF & Holloway, A 2014, BSAVA Manual of Canine and Feline Radiography and Radiology, BSAVA.

Module Title: **APPLIED GENERAL SURGERY**	
Module Code	V3810CS
NQF Level	8
Notional Hours	10
Contact hours	Practical: 1x 3hr practical / alternate week for 6 weeks
Additional learning requirements	None
NQF Credits	1
(Co-requisites) **Prerequisite**	Veterinary General Surgery
Compulsory/Elective	Compulsory
Semester Offered	CS4
Module Purpose	
The purpose of this module is to apply the basic principles of veterinary general surgery, focusing on common domestic animals.	
Overarching Learning Outcome	
Apply the basic principles of veterinary general surgery, focusing on common domestic animals.	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Apply the use of various surgical instruments, suture materials and suture patterns, and understand their use. 2. Apply selected haemostasis techniques to models/cadavers. 3. Apply selected suture techniques to models/cadavers. 4. Apply aseptic techniques in preparation of the theatre, surgeon and patient. 5. Apply the use of various disinfectants and antiseptics, and understand their use.	

Module Content

Practical on surgical instrumentation and haemostasis: application and use of basic soft tissue and orthopaedic instrumentation; as well as application of haemostasis.
Practical on suture materials, suture patterns and techniques: application and use of various suture materials and suture patterns.
Practical on the principles of asepsis, disinfectants, and antiseptics: application of patient and surgeon scrubbing, gowning, gloving, draping, and Halsted principles and well as application and use of various disinfectants and antiseptics.

Learning and Teaching Strategies/Activities

Through practical sessions.

Student Assessment Strategies

Continuous assessment: Minimum of 1 marked practical assessment.
The final continuous assessment mark will constitute a weighting of 100% of the final mark.

Learning and Teaching Enhancement Strategies

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 review of module content.
- Effective supervision and monitoring of assignments, tests and examinations.

Learning resources:

1. Fossum, TW, et al. 2018, Small Animal Surgery, 5th edn, Mosby Inc. Elsevier.
2. Tobias, KM & Johnston, SA 2018, Veterinary Surgery: Small Animal, 2nd edn, Saunders Elsevier.

Module Title: WILDLIFE CLINICAL STUDIES I	
Module Code	V3830PW
NQF Level	8
Notional Hours	30
Contact hours	Lectures: 2x 1hr lectures / week for 6 weeks Practical: 1x 3hr practical / alternate week for 6 weeks
Additional learning requirements	None
NQF Credits	3
(Co-requisites) **Prerequisite**	Infectious Diseases I Infectious Diseases II
Compulsory/Elective	Compulsory
Semester Offered	CS4

Module Purpose

The purpose of this module is to introduce wildlife veterinary medicine to the veterinary undergraduate, and aims to provide a foundation of veterinary science as it relates to wildlife conservation and the game industry in Namibia. A basic understanding of the biological principles underpinning wild animal conservation and management will be presented. 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 principles underlying the ecology of wildlife disease, including epidemiological and disease emergence concepts will be examined, and an awareness of the implications of emerging infectious diseases as a serious hazard both for wild animal species and for the domestic animal and human populations will be discussed. Additionally 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)

Overarching Learning Outcome

The ability to demonstrate focused knowledge on the ways in which the value, both ecologically and economically, of wildlife in Namibia may be realized, together with the possible negative implications of the presence of the pathogen in the wild animal.

Specific Learning Outcomes

On completing the 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

4. Explain the principles and practice of veld management with respect to wildlife.
5. Describe the wildlife/livestock/human interface and explain its significance
6. Describe the major mechanisms for preventing and controlling the transmission of disease within wildlife species, and between wildlife, domestic animals and man
7. Speculate on some of the major emerging and re-emerging infectious diseases involving wildlife and their potential impact
8. 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.
9. Identify zootoxic species of relevance to veterinary medicine and treatment of affected animals

Module Content

Wildlife in Namibia: Namibia – water, land use, wildlife numbers, economic returns; effects of climate change; value of wildlife in Namibia today and in the future
Conservation: key terms in wildlife conservation; conservation principles in terms of wildlife management, successful conservation, approaches to conservation, wildlife value; community involvement in successful conservation; relevant Namibian legislation; components of wildlife protection; components of wildlife biology and behavior; habitat; range; management principles; population dynamics; management styles
Game Ranching: four pillars of game ranching; nutrition management practices; genomics; Intentional Genetic Manipulation; negative impacts of selective and intensive breeding; Namibia's "Golden Opportunity"
Veld Management for Wildlife: types of vegetation occurring; land degradation; natural veld managers; ecological disturbance; grazing management practices
Disease Ecology: ecological, epidemiological and disease emergence concepts; the Ecosystem; Ecosystem interferences; epidemiological concepts; disease emergence; disease categories
One Health: mitigation of effects of crises that originate at the interface between humans, animals and their various environments including antibiotic resistance
Emerging and Re-Emerging Diseases
Wildlife Diagnosis/Effects of Disease in Wildlife: diagnostic process; origin of (emergence of) disease; potential negative impacts of disease
Wildlife Disease Management (Prevention and Control): disease management options; strategies to prevent and control disease; wild animal population management in Namibia to control disease in domestic animals
Snake Bite Management in Animals
Game Camp Design

Learning and Teaching Strategies/Activities

Blended teaching model through lectures, design a Game Camp and practicals. Group work: gather information through Q & A with farm manager; inspection of prospective game camp on Neudamm; PowerPoint presentation of the camp and its management plan.

Student Assessment Strategies

Continuous Assessment: Test 1 (35%), Test 2 (35%) and Game Camp Practical (30%).

Additionally there may be ad hoc quizzes, debates, class discussions

Learning and Teaching Enhancement Strategies

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 student supervision and monitoring of assignments, tests and examinations

Learning resources:

1. Game ranch management - Bothma J du P, Du Toit JG (6th Ed - 2016) ISBN: 9780627033469 Van Schaik
2. Veld Management – Principles and Practice (1st Ed -2015) Frits van Oudtshoorn. ISBN 978-1-920217-29-7 BRIZ
3. The New Game Rancher – Pamela and Peter Oberem (1st Ed -2016), ISBN 978-1-920217-62-4 BRIZA
4. Intensive Wildlife Production in Southern Africa – J. du. P. Bothma and N. van Rooyen. 2006. Van Schaik
5. Guidelines for the Harvesting & Processing of Wild Game in Namibia 2016 – Diana L van Schalkwyk & Louwrens C Hoffman – MET/GIZ
6. Game – A guide to Animal Diseases in South Africa – GAME . Pamela and Peter Oberem. Briza Publications. 2012 (2nd impression). ISBN 978-1-920217-16-7
7. Infectious Diseases of Livestock – JR Coetzer, GR Thomson, RC Tustin (Vol 1,2,3) – Oxford University Press. (Electronic)

Module Title: THERIOGENOLOGY I	
Module Code	V3830PT
NQF Level	8
Notional Hours	30
Contact hours	Lectures: 2x 1hr lectures / week for 6 weeks Practical: 1x 3hr practical / 3rd week for 6 weeks 3 ½ hours per week of integrated learning and instruction
Additional learning requirements	None
NQF Credits	3
(Co-requisites) **Prerequisite**	Animal Nutrition Animal Production Infectious Diseases I Infectious Diseases II Clinical Diagnostics Veterinary Pharmacology General Pathology General Surgery
Compulsory/Elective	Compulsory
Semester Offered	CS4

Module Purpose

The purpose of this module is to develop appropriate knowledge of the physiology of the oestrus cycle, pregnancy period, and andrology 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 skills for selected domestic animals with regards to reproduction and issuance of breeding soundness evaluation certificates.

Overarching Learning Outcome

Apply reproduction physiology in understanding and treating reproduction deviations, assisting in economic breeding programmes for breeders and farmers.

Specific Learning Outcomes

On completing the module students should be able to:

1. Apply breeding manipulation including oestrus and ovulation synchronization in selected farm animals
2. Discuss the physiology of semen production in the male animal
3. Discuss gametogenesis, spermatogenesis and oogenesis, in domestic animals

Module Content

Applied anatomy of the male and female reproductive organs
Physiology of the reproduction cycles including spermatogenesis and oogenesis.
Introduction to semen evaluation and andrology in selected animals

Learning and Teaching Strategies/Activities

Blended teaching model through integrated lectures, class discussions and practical

Student Assessment Strategies

Continuous Assessment: One continuous theory assessment

Learning and Teaching Enhancement Strategies
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 test and practical.

Learning resources:

1. Current therapy in Large Animal Theriogenology by Robert S Young and Walter R. Threlfall
2. Veterinary Reproduction and Obstetrics Ninth Edition by David E Noakes, Timothy J. Parkinson and Gary C.W. England
3. Veterinary Obstetrics and Genital diseases by Stephen J. Roberts
4. Pathways to Pregnancy and Parturition. Second Edition. P.L. Senger Ph.D.
5. McDonald's Veterinary Endocrinology and Reproduction Fifth Edition edited by Maurico H. Pineda and Michael P. Dooley
6. Equine Breeding Management and Artificial Insemination by Juan. Samper; Second Edition
7. Practical Manual of Veterinary Gynaecology & Obstetrics by Madhu Shivare, M.S. Thakur, S.P. Shukla
8. Canine and Feline Endocrinology and Reproduction (Third edition) by E.C. Feldman and RW Nelson (2003) WB Saunders Company, 1104pp
9. Breeding is a Bitch by KMG de Cramer

Module Title: PRODUCTION ANIMAL CLINICAL STUDIES I	
Module Code	V3830PP
NQF Level	8
Notional Hours	30
Contact hours	Lectures: 2x 1hr lectures / week for 6 weeks Practical: 1x 3hr practical / alternate week for 6 weeks
Additional learning requirements	None
NQF Credits	3
(Co-requisites) **Prerequisite**	Veterinary Toxicology II Infectious Diseases I Infectious Diseases II Clinical Diagnostics Veterinary Pharmacology General Pathology General Surgery Veterinary Parasitology I Veterinary Parasitology II
Compulsory/Elective	Compulsory
Semester Offered	CS4
Module Purpose	
The purpose of this module is to improve the 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.	
Overarching Learning Outcome	
Discuss important aspects of poultry and pig production including nutrition, housing and breeding, which have a bearing on disease prevention and control.	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Discuss the important aspects of poultry and pig production 2. Discuss nutritional and housing strategies to ensure maximum productivity of pigs and chickens	

Module Content

Pigs: nutrition and related disorders
Poultry: avian anatomy and physiology; poultry flock health and management programmes, including vaccination programs, aspects of housing and production systems, nutrition and nutritional diseases.

Learning and Teaching Strategies/Activities

Blended teaching model through integrated lectures, practicals and class discussions

Student Assessment Strategies

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

Learning and Teaching Enhancement Strategies

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 test and practical

Learning resources:

1. Modern pig production; by Danie Visser.
2. Poultry production in hot climates; 2nd; by Daghir
3. Textbook of veterinary anatomy; by Dyce, Sack & Wensing; 4th Edition.
4. Diseases of Swine, by Jeffrey, J. Zimmerman et al. 10th Edition, Wiley - Blackwell.
5. Diseases of Poultry, by David Swayne et al. 13th Edition, Wiley – Blackwell.
6. Swine nutrition; Lewis Southern; 2nd Edition.
7. Pig disease identification and diagnosis guide; Steven McOrist.
8. Diseases and Parasites of swine; by Gove Hambidge
9. Pig production; by Bhat, Mohan & Sukh Deo.
10. Small scale poultry production. FAO animal production & health manual. Vol. 1.
11. Current therapy in avian medicine and surgery; by Brian L. Speer.
12. A pocket guide to poultry health and disease. Paul McMullin.
13. Avian medicine, 3rd Ed. Jaime Samour.

Electronic books:

1. http://www.merckvetmanual.com/
2. Veterinary Anatomy: A Study and Dissection Guide. By Bezuidenhout, Groenewald, Hornsveld, Soley & Turner, Volume 3, Chapter 38.

HTML links:

1. https://vetmed.iastate.edu/vdpam/FSVD/swine/index-diseases
2. http://www.thepoultrysite.com/
3. https://poultrykeeper.com
4. http://www.thepigsite.com
5. http://www.pigprogress.net

Module Title: SYSTEMIC PATHOLOGY	
Module Code	V3803AS
NQF Level	8
Notional Hours	200
Contact hours	Lectures: 2x 1hr lectures / week for 13 weeks per semester Practical: 1x 3hr practical / alternate week for 13 weeks per semester
Additional learning requirements	None
NQF Credits	20
(Co-requisites) **Prerequisite**	General Pathology
Compulsory/Elective	Compulsory
Semester Offered	1 and 2 (year module)

Module Purpose

The purpose of this module is to impart knowledge of animal diseases by a systematic and species-specific approach based on a common development, traumatic, degenerative, vascular, toxic, infectious, neoplastic and miscellaneous conditions.

Overarching Learning Outcome

Understand and describe the pathology for diseases of veterinary importance through a correctly performed animal necropsy.

Specific Learning Outcomes

On completing the module students should be able to:

1. Demonstrate an understanding of 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

Diseases affecting body systems: cardiovascular system; central nervous system; haemolymphatic system; urinary system; musculoskeletal system; respiratory system; integumentary system; female reproductive system and the udder; male reproductive system; endocrine system; digestive system; hepatobiliary systems; pathology of the eye and ear.
Major and common malformations: characteristic features
Degenerative lesions: gross and microscopic pictures
Inflammatory lesions: gross and microscopic pictures
Tissue lesions due to diseases
Specific lesions peculiar to the systems
Parasites found in the system: their effects
Neoplasms: especially primary neoplasms affecting the system.

Learning and Teaching Strategies/Activities

Blended teaching model through integrated lectures, practical sessions and class discussions.

Student Assessment Strategies

Continuous Assessment: Minimum 4 (2 per semester) theory assessments (1hr - 60marks – each test count 30%) and at least 4 marked practical tests contributing to 30 % and 10% for post mortem reports.

Examination: 1 x 2hr practical examination and 1 x 3hr theory paper

Learning and Teaching Enhancement Strategies

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
- Monitoring and evaluation by relevant professional regulatory bodies.

Prescribed Learning Resources

Prescribed textbooks:

1. Jubb, Keneddy & Palmers Pathology of Domestic Animals, 6th Revised Edition, 2015. Publisher, Elsevier Health Sciences, London, United Kingdom, ISBN10, 0702053228 and ISBN13, 9780702053221
2. Color Atlas of Veterinary Pathology (2nd Edition) General morphological reactions of organs and tissues. Edited by: J.E van Dijk, E. Gruys and J.M.V.M. Mouwen, Publisher: Willey, ISBN: 978-0-7020-2758-1.

Additional resources:

1. Introduction to Veterinary Pathology, 3rd Edition by Norman F. Cheville, October 2006, ©2006, Publisher: Wiley-Blackwell, ISBN 978-0-81-38-2495-6.
2. Robbins Basic Pathology: Philadelphia, Richard Sheppard, Kumar, Vinay, Abbas, Abul K, Fausto, Nelson (2007), Saunders, ISBN 1-4160-2973-7, 8th Edition
3. https://www.msdvetmanual.com/

Module Title: VETERINARY PUBLIC HEALTH I	
Module Code	V3811AV
NQF Level	8
Notional Hours	190
Contact hours	Lectures: 3x 1hr lectures / week for 13 weeks Practical: 1x 3hr practical / alternate week for 13 weeks
Additional learning requirements	None
NQF Credits	19
(Co-requisites) **Prerequisite**	Veterinary Parasitology I Veterinary Parasitology II Infectious Diseases I Infectious Diseases II General Pathology
Compulsory/Elective	Compulsory
Semester Offered	1

Module Purpose

The purpose of this module is to provide students with an overview of the role of the veterinary profession with respect to public health on a national, regional and international level and will provide students with a comparative overview of the most important zoonotic, waterborne and food borne diseases

Overarching Learning Outcome

Understanding 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).

Specific Learning Outcomes

On completing the module students should be able to:

1. Discuss the role of the veterinary professional in public health on national, regional and international level
2. Outline the various stages of the food production chain that lead 'from farm to fork' and identify critical stages at which risks to public health may occur
3. Explain the basic principles of food safety and food safety system development (pre-requisites/HACCP principles)
4. Describe the key features of sustainable food production management practices on national, regional and international level, emphasizing the control of the most important zoonotic, waterborne and food borne diseases.

Module Content

Basic principles of food safety and food safety system development: pre-requisites; HACCP principles
Development and enforcement of laws and regulations impacting food animal processing industries and food consumers: traceability; ante- and post-mortem inspection; certification requirements.
Practices relevant to national, regional and international trade requirements.

Learning and Teaching Strategies/Activities

Blended teaching model through integrated lectures, class discussions, tutorials and practicals in small (maximum 6 students) groups.

Student Assessment Strategies

Continuous Assessment: Minimum 2 theory assessments (1hr - 60marks – each test count 30%) and at least 4 marked practical tests contributing to 40%.

Examination: 1 x 3hr theory examination

Learning and Teaching Enhancement Strategies

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
- Monitoring and evaluation by relevant professional regulatory bodies.

Prescribed Learning Resources

Prescribed textbook:

1. Pre-harvest and postharvest Food Safety, Beier, Pillai, Phillips; JFT-Press/Blackwell Publishing, 2004

Additional resources:

1. Codex Alimentarius Guidelines
2. World Organization for Animal Health (OIE), International Animal Health Code; www.oie.int (including the FAO guidelines)

Module Title: COMPANION ANIMAL CLINICAL STUDIES I	
Module Code	V3813CC
NQF Level	8
Notional Hours	400
Contact hours	Lectures: 3x 1hr lectures / week for 13 weeks per semester Practical: 1x 3hr practical / week for 13 weeks per semester 6hrs integrated lectures and practicals per week
Additional learning requirements	None
NQF Credits	40
(Co-requisites) **Prerequisite**	(Clinical Pathology) Veterinary Parasitology I Veterinary Parasitology II Veterinary Pharmacology Veterinary Toxicology II Infectious Diseases I Infectious Diseases II Veterinary General Surgery Veterinary Diagnostic Imaging Clinical Diagnostics
Compulsory/Elective	Compulsory
Semester Offered	1 and 2 (year module)

Module Purpose

The purpose of this module is to provide students with a holistic integrated 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.

Overarching Learning Outcome

Demonstrate a structured problem-solving approach to clinical cases in small companion animals.

Specific Learning Outcomes

On completing the 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

Main Topics: Pathophysiology; Diagnosis; Clinical Management; Best Treatment Options of disease processes affecting various organ systems.
Subtopics: Medicine; Surgery; Applied Clinical Pathology; Applied Diagnostic Imaging; Clinical Diagnostics.
In this is a multi-disciplinary module the above main topics and subtopics are integrated to equip the student with a holistic blended approach to the diagnosis, treatment and prevention of diseases in small animal patients.
The module content is in compliance with the requirements of current Namibian veterinary legislation and subject to audit by the Namibian Veterinary Council

Learning and Teaching Strategies/Activities

Through blended 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.
Case studies form an integral part of the blended lectures and practicals.

Student 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 consists of 1 x 3hr integrated written 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%.

Learning and Teaching Enhancement Strategies

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, practicals, tests and examinations

Prescribed Learning Resources

Prescribed textbooks:

1. Ettinger, SJ, Feldman, EC & Côte, E, 2017, Textbook of veterinary internal medicine, 8th edn, Elsevier.
2. Fossum, TW, et al. 2018, Small Animal Surgery, 5th edn, Elsevier.

Additional resources:

1. Tobias, KM & Johnston, SA 2018, Veterinary Surgery: Small Animal, 2nd edn, Elsevier.
2. Thrall, M. A., Weiser, G., Allison, R. W., & Campbell, T. W. (Eds.). (2012). Veterinary hematology and clinical chemistry. John Wiley & Sons
3. Thrall, DE 2013, Textbook of veterinary diagnostic radiology, 6th edn, Elsevier.
4. D. J. Chew; Canine and Feline Nephrology and Urology; 2nd Edition; Elsevier
5. K.H. Rhodes; Small Animal Dermatology; 3Rd Edition; Blackwell's Five-Minute Veterinary Consult
6. A. Neuber et al; Diagnostic Techniques in Veterinary Dermatology; Wiley Blackwell
7. R. Washabau et al; Canine and Feline Gastroenterology; Elsevier
8. V. Chetboul; Clinical Echocardiography; Elsevier
9. L.P. Tilley; ECG for the Small Animal Practitioner; Teton New Media
10. M. Schaer; Clinical Signs in Small Animal Medicine; CRC Press

Module Title: PRODUCTION ANIMAL CLINICAL STUDIES II	
Module Code	V3831PP
NQF Level	8
Notional Hours	190
Contact hours	Lectures: 3x 1hr lectures / week for 13 weeks Practical: 1x 3hr practical / alternate week for 13 weeks
Additional learning requirements	None
NQF Credits	19
(Co-requisites) **Prerequisite**	(Production Animal Clinical Studies I) (Clinical Pathology) Veterinary Toxicology II Infectious Diseases I Infectious Diseases II Clinical Diagnostics Veterinary Pharmacology General Pathology General Surgery Veterinary Parasitology I Veterinary Parasitology II
Compulsory/Elective	Compulsory
Semester Offered	1

Module Purpose

The purpose of this module is 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.

Overarching Learning Outcome

Identify and describe the aetiology, pathogenesis, clinical and post-mortem findings, diagnosis, treatment, prevention and control of important diseases / conditions of the relevant systems and metabolic diseases / conditions of pigs and poultry.

Specific Learning Outcomes

On completing the module students should be able to:

1. Identify and describe the aetiology and pathogenesis of some of important diseases of pigs and poultry
2. Diagnose and treat some of important diseases of pigs and poultry
3. Recommend correct biosecurity measures applicable to piggeries and poultry houses

4. Integrate concepts of anatomy, physiology, disease manifestation as its applies to poultry and porcine treatment
5. Perform basic practical procedures in poultry and pigs

Module Content

Pigs: diagnosis and treatment of important parasitic and infectious diseases and other miscellaneous conditions; applied surgical techniques; herd basis strives improvement of the health status and production effectiveness of piggeries from a holistic and cost-effective viewpoint.
Poultry: diagnosis and treatment of parasitic, infectious and management-related diseases of importance in the poultry industry.

Learning and Teaching Strategies/Activities

Blended teaching model through integrated lectures, practicals and class discussions

Student 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%.

Learning and Teaching Enhancement Strategies

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 test and practical.

Prescribed Learning Resources

Prescribed textbooks:

1. Diseases of Swine, by Jeffrey, J. Zimmerman *et al*. 10th Edition, Wiley - Blackwell.
2. Diseases of Poultry, by David Swayne *et al.* 13th Edition, Wiley – Blackwell.

Additional resources:

1. Textbook of veterinary anatomy; by Dyce, Sack & Wensing; 4th Edition.
2. Modern pig production; by Danie Visser.
3. Poultry production in hot climates; 2nd; by Daghir
4. Swine nutrition; Lewis Southern; 2nd Edition.
5. Pig disease identification and diagnosis guide; Steven McOrist.

6. Diseases and Parasites of swine; by Gove Hambidge
7. Pig production; by Bhat, Mohan & Sukh Deo.
8. Small scale poultry production. FAO animal production & health manual. Vol. 1.
9. Current therapy in avian medicine and surgery; by Brian L. Speer.
10. A pocket guide to poultry health and disease. Paul McMullin.
11. Avian medicine, 3rd Ed. Jaime Samour.

Electronic books:

1. http://www.merckvetmanual.com/
2. Veterinary Anatomy: A Study and Dissection Guide. By Bezuidenhout, Groenewald, Hornsveld, Soley & Turner, Volume 3, Chapter 38.

HTML links:

1. https://vetmed.iastate.edu/vdpam/FSVD/swine/index-diseases
2. http://www.thepoultrysite.com/
3. https://poultrykeeper.com
4. http://www.thepigsite.com
5. http://www.pigprogress.net

Module Title: THERIOGENOLOGY II	
Module Code	V3823PT
NQF Level	8
Notional Hours	200
Contact hours	Lectures: 2x 1hr lectures / week for 13 weeks per semester Practical: 1x 3hr practical / alternate week for 13 weeks per semester
Additional learning requirements	None
NQF Credits	20
(Co-requisites) **Prerequisite**	(Theriogenology I) Infectious Diseases I Infectious Diseases II Clinical Diagnostics Veterinary Pharmacology General Pathology General Surgery
Compulsory/Elective	Compulsory
Semester Offered	1 and 2 (year module)

Module Purpose

The purpose of this module is to develop 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.

Overarching Learning Outcome

Diagnose, treat and recommend breeding practices of the male animal. Apply complete reproductive management of the bitch.

Specific Learning Outcomes

On completing the module students should be able to:

1. Discuss the physiology of pregnancy, parturition and puerperium in selected domestic animals.
2. Discuss semen handling and semen freezing in selected domestic species
3. Perform ultrasound examination for pregnancy examinations
4. Discuss and compare reproductive cycles in selected domesticated animals, dogs and cats
5. Discuss normal fertilization and diagnostic approaches to infertility in selected domestic animals, dogs and cats, and apply appropriate management strategies
6. Diagnose pregnancy in different domestic animal species, dogs and cats, and recognize abnormal pregnancy and apply corrective measures

7. Determine when intervention is necessary (including use of obstetrical instruments and performing caesarean sections in the above species)
8. Induce abortion and parturition in selected domestic animal species, dogs and cats.
9. Manage dystocia and post-partum disorders of the female companion animal including caesarean section in dogs.
10. Discuss treatment and care of the neonate of selected domestic species.
11. Detect and manage infectious and non-infectious diseases and disorders of the male and female companion animal reproductive systems emphasizing causes of abortion in selected domestic animals, dogs and cats.
12. Perform semen evaluation and clinical examination of the male reproductive tract in selected domestic species.
13. Perform bull and ram breeding soundness examinations including sheath scraping and various diagnostic tests for common diseases affecting reproduction
14. Discuss the manipulation animal reproductive cycles towards ensuring successful fertilization through natural or artificial insemination in various species
15. Perform various methods of assisted animal reproduction (including artificial insemination)
16. Discuss multiple ovulation embryo transfer and its role in the preservation of animal biodiversity.

Module Content

Introduction to pregnancy diagnosing, semen evaluation and semen preservation and breeding manipulation: general reproduction for livestock species, including canine, feline and porcine.

Learning and Teaching Strategies/Activities

Blended teaching model through integrated lectures, class discussions and practical

Student 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 practical 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%).

Learning and Teaching Enhancement Strategies

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 test and practical.

Prescribed Learning Resources

Prescribed textbooks:

1. Current therapy in Large Animal Theriogenology by Robert S Young and Walter R. Threlfall
2. Veterinary Reproduction and Obstetrics Ninth Edition by David E Noakes, Timothy J. Parkinson and Gary C.W. England

Additional resources:

1. Veterinary Obstetrics and Genital diseases by Stephen J. Roberts
2. Pathways to Pregnancy and Parturition. Second Edition. P.L. Senger Ph.D.
3. McDonald's Veterinary Endocrinology and Reproduction Fifth Edition edited by Maurico H. Pineda and Michael P. Dooley
4. Equine Breeding Management and Artificial Insemination by Juan. Samper; Second Edition
5. Practical Manual of Veterinary Gynaecology & Obstetrics by Madhu Shivare, M.S. Thakur, S.P. Shukla
6. Canine and Feline Endocrinology and Reproduction (Third edition) by E.C. Feldman and RW Nelson (2003) WB Saunders Company, 1104pp
7. Breeding is a Bitch by KMG de Cramer

Module Title: WILDLIFE CLINICAL STUDIES II	
Module Code	V3863PW
NQF Level	8
Notional Hours	200
Contact hours	Lectures: 2x 1hr lectures / week for 13 weeks per semester Practical: 1x 3hr practical / alternate week for 13 weeks per semester
Additional learning requirements	One (1) full week field training/practical (40 hours)
NQF Credits	20
(Co-requisites) **Prerequisite**	(Wildlife Clinical Studies I) Infectious Diseases I Infectious Diseases II Clinical Diagnostics Veterinary Pharmacology General Pathology General Surgery Veterinary Parasitology I Veterinary Parasitology II
Compulsory/Elective	Compulsory
Semester Offered	1 and 2 (year module)

Module Purpose

Mindful of the One Health perspective, and concentrating at the interface between wild animals, domestic animals and man, the purpose of this module is to provide the Namibian veterinarian of tomorrow with the managerial skills to monitor, manage and maintain a healthy population of wildlife in Namibia and to deal with the challenges of wildlife conservation and an ever-growing game industry. Areas covered will include common wildlife infectious diseases and their control, wildlife pathology, disease surveillance, trade in game and the law as it relates to the veterinarian working with wildlife in Namibia. Additionally the impact of the pathogen in wildlife will be examined.

The 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.

Overarching Learning Outcome

The successful student will have the knowledge of how to monitor, manage and maintain a healthy population of wildlife in Namibia, as well as how to plan, execute and evaluate the physical capture, care and transport of wildlife in Namibia.

Specific Learning Outcomes

On completing the module students should be able to:

1. Diagnose some of the important viral, bacterial, protozoal and parasitic diseases of wildlife
2. Describe the epidemiology of some important (in particular Transboundary) diseases of selected wildlife and how they relate to domestic animals and man
3. Explain the potential negative impact of infection and disease on wildlife populations
4. Describe how to carry out surveillance of wildlife populations highlighting some of the limitations of currently available tests
5. Reflect on the possible positive and negative impacts of legal and illegal trade in wildlife
6. List the common practices used in wildlife monitoring and demonstrate at least one of them
7. List and interpret the Namibian legislation with respect to the wildlife veterinarian, the wildlife industry and wildlife trade both within Namibia and for export
8. Describe and demonstrate appropriate safety procedures when working with wild animals
9. Discuss the common causes of capture related injuries and deaths and appreciate the role of stress in wild animal capture
10. List the common forms of drug injecting systems, and describe and demonstrate the use of projectile darting systems
11. Compare and criticise possible physical capture methods commonly used in southern Africa for a variety of different wildlife species
12. Compare and criticise possible transport systems commonly used in southern Africa for a variety of different wildlife species
13. Plan, participate in and analyse the success of a capture operation
14. Demonstrate appropriate record keeping when capturing, transporting, treating, testing and managing wild animals
15. Describe suitable facilities for the holding and quarantine of wild animals, and describe appropriate boma managements systems
16. Discuss different hand-rearing systems for captive wildlife
17. Describe and demonstrate the application of good animal welfare principles within the wildlife arena
18. List the major forms of human wildlife conflict, describe possible mitigation measures and their limitations

Module Content

Wildlife Diseases: epidemiology; clinical picture; diagnosis and control of selected diseases including Bovine TB; Anthrax; Brucellosis; Rabies, MCF; Canine Distemper Virus; Theileriosis and epidemiology of Bovine Viral Diarrhoea; Rift Valley Fever; Canine Parvovirus; Feline Herpes; Coronavirus; Retroviruses; Elephant viruses; Heartwater; Anaplasma, Babesia and trypanosomes.
Transboundary Animal Diseases (TADs): including FMD; African Horse Sickness; PPR; African Swine Fever
Parasites of Wildlife: endo and ecto-parasite control
Chemical Wildlife Poisoning
Wildlife Pathology, the Post Mortem, Sample Collection and Forensics
Disease Surveillance in Wildlife
Wildlife Trade – Legal and Illegal
Wildlife Monitoring
Wildlife Legislation
Safety in Wildlife Practice
Ethics and the Wild Animal
Drug injection systems for game capture
Physical Capture of Wildlife: including plastic mass-capture boma; net gun; helicopter; box / cage trap; free-darting
Wild Animal Transport Systems and regulations
Wild Animal Holding Facilities and Management
Capture related deaths and Injuries
Record Keeping in Wildlife Veterinary Practice
Human Wildlife Conflict & Mitigation
Hand Rearing the Captive Wild Animal

Learning and Teaching Strategies/Activities

Blended teaching model through lectures, practicals and field trip: Planning, Undertaking and Reporting on a Mass Capture

Student Assessment Strategies

Continuous Assessment: Test 1 – 3 (20% each); Clinical / Practical Scenarios (40%). Additionally there may be adhoc quizzes, debates, class discussions.

Final Exam: Paper: 1x 3hr theory paper (75% of final exam points); Practical: 1x 1hr practical exam (25% of final exam points)

Learning and Teaching Enhancement Strategies

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 student supervision and monitoring of assignments, tests and examinations

Prescribed Learning Resources

Prescribed textbooks:

1. Game ranch management - Bothma J du P, Du Toit JG (6th Ed - 2016) ISBN: 9780627033469 Van Schaik
2. The New Game Rancher – Pamela and Peter Oberem (1st Ed -2016), ISBN 978-1-920217-62-4 BRIZA

Additional resources:

1. Intensive Wildlife Production in Southern Africa – J. du. P. Bothma and N. van Rooyen. 2006. Van Schaik
2. Guidelines for the Harvesting & Processing of Wild Game in Namibia 2016 – Diana L van Schalkwyk & Louwrens C Hoffman – MET/GIZ
3. Game – A guide to Animal Diseases in South Africa – GAME . Pamela and Peter Oberem. Briza Publications. 2012 (2nd impression). ISBN 978-1-920217-16-7
4. Infectious Diseases of Livestock – JR Coetzer, GR Thomson, RC Tustin (Vol 1,2,3) – Oxford University Press. (Electronic)
5. The Capture, Care and Management of Wildlife – Mike la Grange (1st Ed-2006) ISBN 0 627 026117 Van Schaik
6. Chemical and Physical Restraint of Wild Animals – Mike Kock & Richard Burroughs (2nd Ed -2012) ISBN 978-062052162-8 IWVS Africa (1st Ed in Libabry)
7. The Capture and Care Manual: Capture, Care, Accomodation and Transport of wild African animals. Ed; Andre A. Mckenzie. Pub: Widlife decision Support Services 1993 ISBN: 0620176083, 9780620176088

Module Title: VETERINARY EPIDEMIOLOGY	
Module Code	V3843AE
NQF Level	8
Notional Hours	200
Contact hours	Lectures: 2x 1hr lectures / week for 13 weeks in per semester Practical: 1x 3hr practical / alternate week for 13 weeks per semester
Additional learning requirements	None
NQF Credits	20
(Co-requisites) **Prerequisite**	Biometry Infectious Diseases I Infectious Diseases II
Compulsory/Elective	Compulsory
Semester Offered	1 and 2 (year module)

Module Purpose

The purpose of this module is 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.

Overarching Learning Outcome

Apply epidemiological principles to disease investigation and control and their application in state and international veterinary medicine.

Specific Learning Outcomes

On completing the 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 and apply epidemiological and statistical measures of association
3. Discuss the host-agent-environmental interaction
4. Explain and measure disease frequency and burden in terms of prevalence, incidence, morbidity and mortality
5. Explain the different sampling methods and their application in epidemiological investigations
6. Describe the design of observational and experimental epidemiological studies as well as clinical trials

7. 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
8. Apply principles of disease surveillance, monitoring systems, survey design, epidemiological data and information management including the use of computer software including Geographic Information System
9. Conduct qualitative risk analyses and explain their application to animal health decision-making processes.
10. Apply epidemiological principles to disease investigation and control and their application in state and international veterinary medicine

Module Content

Introduction to epidemiological concepts, definitions, purpose, meaning and scope: disease causation; intrinsic and extrinsic determinants of disease; disease ecology; disease transmission; disease events in populations; measuring disease frequency and production; host-agent-environmental interaction; temporal, spatial and clustering factors; epidemiological and statistical measures of association; concepts of bias; confounding and interaction variables and control; application of concepts; design of observational epidemiological studies; sampling methodology; sample size determination; principles and concepts of diagnostic-test validation and performance and clinical trial

Data and information management: principles and applications of questionnaire design; use of geographic information systems; concepts of monitoring and surveillance; survey design; introduction to risk analysis; planning, designing, managing and implementing disease control; eradication programmes; emergency preparedness and contingency planning.

Learning and Teaching Strategies/Activities

Blended teaching model through lectures, case studies and tutorials

Student Assessment Strategies

Continuous Assessment (CA) will entail a minimum of 2 theory assessments in the form of tests each allocated 100 marks and at least 5 marked tutorial assessments each allocated 20 marks and 2 assignments each allocated 10 marks.

CA (30% Theory and 10% Practical)

Examination: 1 x 3hr theory paper

Learning and Teaching Enhancement Strategies

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 test and practical.

Prescribed Learning Resources

Prescribed textbooks:

1. Stevenson M. (2008), An Introduction to Veterinary Epidemiology, Massey University, Palmerston North, New Zealand. (Comprehensive set of notes)
2. Thrusfield, M. 2018. Veterinary Epidemiology, 4th Edition. Blackwell Science LTD. ISBN978-1-405-15627-1. It is also available at http://dvmbooks.weebly.com/uploads/2/2/3/6/22365786/1._veterinary_epidemiology_thrush_filled.pdf

Additional resources:

1. Martin, Meek and Willeberg available at: https://www.researchgate.net/profile/Preben_Willeberg/publication/291997559_Veterinary_Epidemiology_Principles_and_Methods/links/591c9bdfaca272d31bca980e/Veterinary-Epidemiology-Principles-and-Methods.pdf
2. Stevenson, M 2008 is available at: http://www.massey.ac.nz/massey/fms/Colleges/College%20of%20Sciences/Epicenter/docs/ASVCS/Stevenson_intro_epidemiology-web_2008.pdf
3. For sample size calculations a free online software is available at: http://epitools.ausvet.com.au/content.php?page=home

Software:

1. Thrusfield (2018) is a available at: in the UNAM e-library
2. Martin, Meek and Willeberg available at:
3. https://www.researchgate.net/profile/Preben_Willeberg/publication/291997559_Veterinary_Epidemiology_Principles_and_Methods/links/591c9bdfaca272d31bca980e/Veterinary-Epidemiology-Principles-and-Methods.pdf

Module Title: VETERINARY PUBLIC HEALTH II	
Module Code	V3812AV
NQF Level	8
Notional Hours	190
Contact hours	Lectures: 3x 1hr lectures / week for 13 weeks Practical: 1x 3hr practical / alternate week for 13 weeks
Additional learning requirements	None
NQF Credits	19
(Co-requisites) **Prerequisite**	(Veterinary Public Health I) Veterinary Parasitology I Veterinary Parasitology II Infectious Diseases I Infectious Diseases II General Pathology
Compulsory/Elective	Compulsory
Semester Offered	2

Module Purpose

The purpose of this module is to provide the students with a broad understanding of the principles and programmes within the Namibian veterinary public health system including international trade requirements.

Overarching Learning Outcome

Identify microbiological and physical foodborne hazards. Apply animal welfare standards along the food chain. Discuss relevant legislation impacting animal-derived food processing industries and food consumers.

Specific Learning Outcomes

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

1. Discuss the development and enforcement of laws and regulations impacting food processing industries and food consumers on national and international level
2. Discuss food safety systems, including biological risk management programs (based on pre-requisites and HACCP) usable for the farm to fork approach and applicable for national and international trade
3. Discuss the importance of the traceability of animals and animal products as it relates to food safety and disease control
4. Perform meat inspection (ante mortem and post mortem) in compliance with national and international laws and the respective requirements
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 in applying aseptic techniques correctly

7. Discuss the development and enforcement of laws and regulations impacting food animal processing industries and food consumers (e.g. traceability, animal welfare, ante- and post-mortem inspection, certification requirements and verification procedures); based on national, regional and international trade requirements

Module Content

Veterinary public health programmes and overarching principles of food control systems: possible infrastructures and approaches for national and international systems.

Globalization of the food supply chain

Increasing importance of the Codex Alimentarius Commission

Obligations emerging from the World Trade Organization (WTO) Agreements

Learning and Teaching Strategies/Activities

The following teaching methods will be employed: Lectures (these will include PowerPoints and videos), discussion (guided by a lecture topic or literature), case studies- (facilitated case studies based on real life events/scenarios), assignments and presentations that will constitute the year mark and exam mark.

Student Assessment Strategies

Continuous Assessment: Minimum 2 theory assessments (1hr - 60marks – each test count 30%) and at least 4 marked practical tests contributing to 40%.

Examination: Minimum 20 minutes per student for practical examination and 1 x 3hr theory paper

Learning and Teaching Enhancement Strategies

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 assessments (Discussions, presentations and assignments)

Prescribed Learning Resources

Prescribed textbooks:

1. Handbook of Meat and Meat processing, Editor YH Hui, CRC Press, 2012
2. Hygiene in Food processing, HLM Lelieveld et all, Woodhead Publishing, 2006

Additional resources:

1. OIE recommendations on Animal Welfare during transport and slaughtering (OIE Terrestrial Code Chapter 7)
2. Codex Alimentarius Guidelines

Module Title: PRODUCTION ANIMAL CLINICAL STUDIES III	
Module Code	V3832PP
NQF Level	8
Notional Hours	190
Contact hours	Lectures: 3x 1hr lectures / week for 13 weeks Practical: 1x 3hr practical / alternate week for 13 weeks
Additional learning requirements	None
NQF Credits	19
(Co-requisites) **Prerequisite**	(Clinical Pathology) (Production Animal Clinical Studies I) (Production Animal Clinical Studies II) Veterinary Toxicology II Infectious Diseases I Infectious Diseases II Clinical Diagnostics Veterinary Pharmacology General Pathology General Surgery
Compulsory/Elective	Compulsory
Semester Offered	2

Module Purpose

The purpose of this module is 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 haemolymphatic, gastroenterology and metabolic diseases.

Overarching Learning Outcome

Diagnose and treat important diseases of ruminants related to relevant systems, and give correct advice to ruminant livestock owners.

Specific Learning Outcomes

On completing the 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

Common disorders of the major body systems of cattle, sheep and goats: clinical signs, diagnostic tests and treatment options for disorders of individual animals as well as herd management; preventative care; selected surgical procedures.
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.

Learning and Teaching Strategies/Activities

Blended teaching model through integrated lectures, class discussions and practicals

Student Assessment Strategies

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

Examination: 1x 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%.

Learning and Teaching Enhancement Strategies

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 assessments (Discussions, presentations and assignments).

Prescribed Learning Resources

Prescribed textbooks:

1. Radostits, Gay, Hinchcliff & Constable, (2007) Veterinary Medicine: A textbook of diseases of cattle, horses, sheep, pigs, and goats. 10th Edition.
2. Reece et al., (2015). Duke's physiology of domestic animals. 13th Edition.

Additional resources:

1. Bradford P. Smith, (2015). Large animal internal medicine. 5th Edition.
2. N. Kent Ames, (2013). Noordsy's Food Animal Surgery. 5th Ed.
3. Dean A. Hendrickson & AN Baid, (2013). Techniques in large animal surgery. 4th Ed. Wiley Blackwell

4. J.A.W. Coetzer, G.R. Thomson, R.C. Tustin, (1994). Infectious Diseases of Livestock with special reference to Southern Africa. Oxford University Press
5. Divers,T. and Peek, S., (2007). Rebhun's Diseases of Dairy Cattle 2nd Edition. Saunders

Electronic books:

1. Hendrickson, D.A. and Baird, A.N. (2013). Turner's and McIlwraith's Techniques in Large Animal Surgery. 4th Edition. Wiley Blackwell. Available at: https://www.perlego.com/book/1000245/turner-and-mcilwraiths-techniques-in-large-animal-surgery-pdf Accessed on 16 May 2021
2. Abbott, K. (2019). The Practice of Sheep Veterinary Medicine. Available at: https://www.researchgate.net/publication/328665218_The_Practice_of_Sheep_Veterinary_Medicine Accessed on 16 May 2021

HTML links:

1. https://www.merckvetmanual.com/
2. https://www.oie.int/en/what-we-do/standards/codes-and-manuals/
3. https://www.cfsph.iastate.edu/Species/bovine/
4. https://www.cfsph.iastate.edu/Species/small-ruminants/

Module Title: RESEARCH METHODOLOGY	
Module Code	V3840AR
NQF Level	8
Notional Hours	40
Contact hours	Lectures: 1x 1hr lecture / week for 6 weeks Tutorial: 2x 1hr online tutorial / week for 6 weeks
Additional learning requirements	None
NQF Credits	4
(Co-requisites) **Prerequisite**	Veterinary Epidemiology
Compulsory/Elective	Compulsory
Semester Offered	CS5

Module Purpose

The purpose of this module is to prepare students in the formulation and execution of a research project.

Overarching Learning Outcome

Formulate a research problem formulation and research objective. Undertake a literature review, write a research proposal, and present the proposal.

Specific Learning Outcomes

On completing the module students 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. Correctly compile a reference list according to a specific referencing system.
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. Design an effective oral and written presentation.

Module Content

Research process: research problem formulation and research objectives; research methods and principles of research; 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.
Scientific writing: literature review; research proposal; report writing; plagiarism; finding and using literature references; citation of references; presentation of results.

Learning and Teaching Strategies/Activities

Blended teaching model through contact hours and guided self-study online assignments.

Student Assessment Strategies

Continuous Assessment: 6 evaluated weekly assessments (CA 100%).

Assignment 1: Ethical principals in research (10%)
Assignment 2: Effectively retrieve and manage information (15%)
Assignment 3: The principles of the scientific method (10%)
Assignment 4: Project planning and budgeting (10%)
Assignment 5: Design a research proposal, with timetable (35%)
Assignment 6: Design an effective oral presentation (20%)

Learning and Teaching Enhancement Strategies

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

Learning resources:

1. On Being a Scientist: A Guide to Responsible Conduct in Research: Third Edition
2. https://www.ncbi.nlm.nih.gov/pubmed
3. https://www.scopus.com/home.uri
4. http://www.ncrst.na/about-us/research-registration-services/124/

Module Title: ONE HEALTH	
Module Code	V3820AO
NQF Level	8
Notional Hours	20
Contact hours	Lectures: 2x 1hr lectures / week for 6 weeks
Additional learning requirements	None
NQF Credits	2
(Co-requisites) **Prerequisite**	Veterinary Public Health I Veterinary Public Health II
Compulsory/Elective	Compulsory
Semester Offered	CS5

Module Purpose

The purpose of this module is to revive the integration of human health, animal health and environmental health for mutual benefit. The integration of One Health as a global strategy describes and expands on the collaboration and communication between various scientific disciplines at local, national and global levels in pursuit of better health for all, will be explained and demonstrated with examples in environment protection, which enhances human and animal health.

Overarching Learning Outcome

Discuss the basic concept of One Health and to provide a holistic multidisciplinary view of human, animal and environmental management. It will cover the broader concerns related to health and well-being in term of infectious and non- infectious diseases, the health of species and systems at different interfaces, the significance of cross-disciplinary and cross-professional communication and outreach, and finally, conservation and rural development.

Specific Learning Outcomes

On completing the module students should be able to:

1. Define the links between animal health, human health and livelihoods, and ecosystem health
2. Explain the One Health principles and the systematic approach at One Health interfaces
3. Demonstrate knowledge of emerging and re-emerging diseases at human/animal interfaces
4. Discuss global strategies to prevent and control pathogens, and elaborate on the development and coordination of human–animal–ecosystems interfaces applicable at the national, regional and global levels
5. Evaluate the implications of climate change and environmental pollution (especially waste and waste management) and discuss preventative measure/solutions

Module Content

Introduction to the One Health Concept: The history and evolution to One health; One health, Interface and health-related interfaces; One health in the southern Africa; A systematic approach to One health at interfaces.
Emerging and re-emerging diseases at human/animal interfaces: Define a reservoir of infection; Discuss drivers of emerging diseases; listing examples of emerging human pathogens from animal reservoirs; List neglected tropical diseases and explaining the reasons for underdiagnosing and neglect of these diseases
Global strategies to prevent and control pathogens, and elaborate on the development and coordination of human–animal–ecosystems interfaces applicable at the national, regional and global levels
Climate change and environmental pollution (especially waste and waste management): implications and preventative measure and solutions to the current situations.

Learning and Teaching Strategies/Activities

Blended teaching model through lectures (these will include PowerPoints and videos), discussion (guided by a lecture topic or literature), case studies- (facilitated case studies based on real life events/scenarios), assignments and presentations that will constitute the year mark.

Student Assessment Strategies

Continuous Assessment: There will be 2 assessments: a group presentation and a group assignment.
A final mark will be calculated as 50 % group presentation and 50 % group assignment.

Learning and Teaching Enhancement Strategies

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 assessments (Discussions, presentations and assignments).

Learning resources:

1. Hristovski M, Cvetkovik A, Cvetkovik I, Dukoska V. Concept of One Health - a New Professional Imperative. Maced J Med Sci. 2010;3(3):229-232. doi.10.3889/MJMS.1957-5773.2010.0131.
2. Zinsstag *et al*. (2005) Potential of cooperation between human and animal health to strengthen health systems. Lancet, 366: p2142-45
3. Zinsstag, J., Schelling, E., Waltner-Toews, D. & Tanner, M. (2011) From 'one medicine' to 'one health' and systemic approaches to health and well-being. Preventive Veterinary Medicine 101:148-156
4. Conrad, P.A. Mazet, J.A., Clifford, D., Scott, C. & Wilkes, M. (2009) Evolution of a transdisciplinary 'One Medicine - One Health' approach to global health education at the University of California, Davis. Preventive Veterinary Medicine 92: 268 - 274.

Module Title: THERIOGENOLOGY III	
Module Code	V3830PR
NQF Level	8
Notional Hours	30
Contact hours	Lectures: 2x 1hr lectures / week for 6 weeks Practical: 1x 3hr practical / alternate week for 6 weeks
Additional learning requirements	None
NQF Credits	3
(Co-requisites) **Prerequisite**	Theriogenology I Theriogenology II
Compulsory/Elective	Compulsory
Semester Offered	CS5
Module Purpose	
The purpose of this module is to develop the introductory component on 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.	
Overarching Learning Outcome	
Apply knowledge of the physiology of the oestrus cycle to prepare reproduction programmes for optimal economic farming practices.	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Discuss and compare physiology of the reproductive cycles in selected domestic animals. 2. Apply breeding manipulation including oestrus and ovulation synchronization in selected farm animals 3. Determine when intervention is necessary (including use of obstetrical instruments and performing caesarean sections in the above species) 4. Relieve dystocia mechanically	

Module Content

Physiology of reproductive cycles in selected domestic animals.
Manipulation of oestrus and ovulation synchronization in selected farm animals: Principles of assisted animal reproduction in livestock and equines
Diagnose, manage and resolve dystocia cases in selected domestic animals: Caesarian sections and other interventions

Learning and Teaching Strategies/Activities

Blended teaching model through integrated lectures, class discussions and practical

Student Assessment Strategies

Continuous Assessment: One continuous theory assessment

Learning and Teaching Enhancement Strategies

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 test and practical.

Learning resources:

1. Current therapy in Large Animal Theriogenology by Robert S Young and Walter R. Threlfall
2. Veterinary Reproduction and Obstetrics Ninth Edition by David E Noakes, Timothy J. Parkinson and Gary C.W. England
3. Veterinary Obstetrics and Genital diseases by Stephen J. Roberts
4. Pathways to Pregnancy and Parturition. Second Edition. P.L. Senger Ph.D.
5. McDonald's Veterinary Endocrinology and Reproduction Fifth Edition edited by Maurico H. Pineda and Michael P. Dooley
6. Equine Breeding Management and Artificial Insemination by Juan. Samper; Second Edition
7. Practical Manual of Veterinary Gynaecology & Obstetrics by Madhu Shivare, M.S. Thakur, S.P. Shukla
8. Canine and Feline Endocrinology and Reproduction (Third edition) by E.C. Feldman and RW Nelson (2003) WB Saunders Company, 1104pp
9. Breeding is a Bitch by KMG de Cramer

Module Title: COMPANION ANIMAL BEHAVIOURAL MEDICINE	
Module Code	V3860CB
NQF Level	8
Notional Hours	60
Contact hours	Lectures: 2x 1hr lectures / week for 6 weeks Practical: 1x 3hr practical / for 6 weeks 5hrs integrated lectures and practicals per week
Additional learning requirements	None
NQF Credits	6
(Co-requisites) **Prerequisite**	Veterinary Pharmacology Clinical Diagnostics
Compulsory/Elective	Compulsory
Semester Offered	CS5

Module Purpose

The purpose of this module is to provide students with a holistic approach to diagnosing and treating companion animal behaviour problems.

Overarching Learning Outcome

Understand and apply a holistic approach to the diagnosis and treatment of companion animal behavioural problems.

Specific Learning Outcomes

On completing the module students should be able to:

1. Differentiate between normal, unacceptable and abnormal behavior
2. Distinguish between behavioural and medical causes for behaviour problems
3. Discuss the factors that may affect the prognosis in behaviour cases
4. Discuss measures to prevent the occurrence of behaviour problems.
5. Identify how a deficiency in various basic animal needs may lead to the development of behaviour problems
6. Analyse and discuss the different inherited and acquired behaviour concepts
7. Evaluate and discuss appropriate treatment strategies for the following behaviour problems: aggression, nuisance behaviour, elimination problems, anxiety and phobias, compulsive behaviour and cognitive dysfunction.

Module Content

Various behaviour classification concepts
Basic animal needs
Causes, prognosis, prevention and treatment of behaviour problems: including aggression; nuisance behaviours; elimination problems; anxiety and phobias; compulsive behaviours; cognitive dysfunction
Pharmacology for behaviour problems

Learning and Teaching Strategies/Activities

Blended teaching model through lectures and case studies.

Student Assessment Strategies

Continuous assessment: 100%, Minimum of 1 theoretical assessment and 1 marked practical assessment.

Learning and Teaching Enhancement Strategies

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 review of module content.
- Effective supervision and monitoring of assignments and tests.

Learning resources:

1. Horwitz, DF, 2018. Blackwell's Five-Minute Veterinary Consult Clinical Companion: Canine and Feline Behaviour, 2nd edn, Wiley-Blackwell.
2. Horwitz, DF & Mills, DS, 2009, BSAVA Manual of Canine and Feline Behavioural Medicine, 2nd edn, BSAVA.

Module Title: VETERINARY PROFESSIONAL SKILLS V	
Module Code	V3830ES
NQF Level	8
Notional Hours	30
Contact hours	Lectures: 3x 1hr lectures / week for 6 weeks
Additional learning requirements	None
NQF Credits	3
(Co-requisites) **Prerequisite**	None
Compulsory/Elective	Compulsory
Semester Offered	CS5

Module Purpose

The purpose of this module is to develop important skills, knowledge and attributes required by the veterinarian as a professional. The emphasis will be on developing the following skills: general understanding of state veterinary office management

Overarching Learning Outcome

To develop life skills specific to a future career as a Veterinary Professional.

Specific Learning Outcomes

On completing the module students should be able to:

1. Develop and implement an annual plan
2. Plan and implement job descriptions, performance management and performance evaluation in support of the annual plan
3. Identify how to incentivise employees
4. Describe how to attract, develop and retain talent in organisations
5. Describe the concepts of culture and cultural diversity
6. Identify an organisational problem or opportunity and devise an action-learning project to address it.
7. Identify and manage organizational change
8. Plan for life after university
10. Manage a state owned veterinary office including the control of human, financial and material resources
11. Compile an annual budget for a state veterinary office and control finances
12. Demonstrate good practices in state veterinary office
13. Demonstrate good client relationships through effective communication and client consultation skills in state veterinary offices
14. Demonstrate skills in interpersonal communication with staff and clients as a public servant
15. Define and appraise high ethical and professional standards

16. Interpret applicable legislation (circulars and international requirements)

Module Content

Goal setting and annual planning
Business strategy: annual planning implementation, M&E, budgeting
Organisational performance management
Employee management: motivation; training & development, career management
Organisational change management
Finding your niche: CV and cover letter writing, job search, job applications, interviews, professional networking, practical experience, being relevant
Veterinary ethics
Interpretation of applicable legislation for state veterinary offices

Learning and Teaching Strategies/Activities

Blended teaching model through integrated lectures, real life simulations, case studies

Student Assessment Strategies

Continuous Assessment: Minimum 2 assessments and 2 assignments for final CA mark (e.g. written assignment, group assignment, role-play and / or presentation).
Continuous participation assessment during compulsory lecture attendance.

Learning and Teaching Enhancement Strategies

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 review of module content.
- Effective supervision and monitoring of assignments and tests.

Learning resources:

1. All required resources will be supplied to students in hard and/or soft copy, updated annually.

The following are available to the students free of charge:

1. Namibia Vision 2030: Policy Framework for Long-Term National Development. (Summary). Office of the President Private Bag 13356, Windhoek (2004). Available at: https://www.npc.gov.na/vision-2030/?wpfb_dl=36 .
2. Harambee Prosperity Plan II; 2021-2025. Available at: https://www.met.gov.na/files/downloads/f0b_Harambee%20Prosperity%20Plan%20II.pdf.
3. Namibia's Fifth National Development Plan (NDP5). Working Together Towards Prosperity 2017/18 – 2021/22. Available at: https://www.npc.gov.na/?wpfb_dl=294.

4. Ministry of Agriculture, Water and Forestry Strategic Plan – 2017/18 – 2021/22. Available at: https://www.readkong.com/page/strategic-plan-2017-18-2021-22-ministry-of-agriculture-8064270.
5. Animal Health Act, 2011 (Act No. 1 of 2011) (GG 4694) brought into force on 30 April 2013 by GN 100/2013 (GG 5183). Available at: https://www.lac.org.na/laws/annoSTAT/Animal%20Health%20Act%201%20of%202011.pdf.
6. State Finance Act, 1991 (Act No. 31 of 1991). (GG 333) came into force on date of publication: 30 December 1991. Available at: https://laws.parliament.na/cms_documents/state-finance-ca97b38a62.pdf.
7. Public Service Act, 1995 (Act No. 13 of 1995) (GG 1121) brought into force on 1 November 1995 by GN 210/1995 (GG 1185). Available at: https://laws.parliament.na/cms_documents/public-service-bf31f756a0.pdf.
8. DVS Circular V7/2016: Protocol for foot and mouth disease investigation
9. DVS Circular V6/2012: List of reports/submissions required from offices
10. DVS Circular V17/2006: Vaccination Campaign Protocol
11. DVS Circulars, Reports, Protocols and Checklists.

Module Title: CAGE BIRD & EXOTIC ANIMAL CLINICAL STUDIES	
Module Code	V3830CE
NQF Level	8
Notional Hours	30
Contact hours	Lectures: 1x 1hr lectures / week for 6 weeks Practical: 1x 3hr practical / alternate week for 6 weeks
Additional learning requirements	None
NQF Credits	3
(Co-requisites) **Prerequisite**	Veterinary Pharmacology Veterinary Toxicology II Veterinary Diagnostic Imaging Veterinary Anaesthesiology Veterinary General Surgery Clinical Diagnostics
Compulsory/Elective	Compulsory
Semester Offered	CS5
Module Purpose	
The purpose of this module is to provide students with a holistic approach to the handling, care, diagnosis and treatment of diseases in cage birds and exotic animals.	
Overarching Learning Outcome	
Demonstrate a holistic approach to veterinary management and care of cage bird and exotic animal patients	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Discuss the management and care of cage birds, small mammals and reptiles, including basic housing and nutrition. 2. Explain relevant diagnostic imaging and clinical pathology for cage birds. 3. Explain hospitalization and anaesthesia of cage birds, including the use and administration of relevant veterinary drugs. 4. Discuss the aetiology, diagnosis and treatment of the most important diseases of cage birds, small mammals and reptiles. 5. Apply selected basic handling techniques and procedures to cage birds, including clinical examination and wing trimming.	

Module Content

Overview of cage birds: including relevant anatomy; sex determination; housing; handling; clinical examination; diagnostic imaging; clinical pathology; anaesthesia; hospitalization; drug use and administration; fluid therapy; nutrition; wing trimming; and important disease conditions.
Overview of small mammals: including relevant anatomy; housing; handling; clinical examination; and important disease conditions.
Overview of reptiles: including relevant anatomy; housing; handling; clinical examination; and important disease conditions.

Learning and Teaching Strategies/Activities

Blended teaching model through integrated lectures and practicals.

Student Assessment Strategies

Continuous assessment: 100%, Minimum of 1 marked theory assessment.

Learning and Teaching Enhancement Strategies

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 review of module content.
- Effective supervision and monitoring of assignments and tests.

Learning resources:

1. Mayer, J, & Donnelly, TM, 2013, Clinical Veterinary Advisor: Birds and Exotic Pets, Elsevier.
2. Chitty, J, & Monks, D, 2018, BSAVA manual of avian practice: A foundation manual, BSAVA.

Module Title: INTRODUCTION TO EQUINE CLINICAL STUDIES	
Module Code	V3830CH
NQF Level	8
Notional Hours	30
Contact hours	Lectures: 1x 1hr lectures / week for 6 weeks Practical: 1x 3hr practical / alternate week for 6 weeks
Additional learning requirements	None
NQF Credits	3
(Co-requisites) **Prerequisite**	Clinical Diagnostics
Compulsory/Elective	Compulsory
Semester Offered	CS5
Module Purpose	
The purpose of this module is to provide information regarding international equine identification protocols for completing the sports horse passports (diagram and narrative) as well as to present and enable the student to examine a horse for insurance or pre-purchase purposes.	
Overarching Learning Outcome	
Correctly and comprehensively identify and examine an equid.	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Thoroughly and completely perform a general clinical examination of the horse. 2. Complete the international passport identification diagram for sport horses and professionally describe the horse in the identification narrative. 3. Complete a Pre-purchase and Insurance examination of a horse	

Module Content

Detailed General Clinical Examination of the horse
International equine identification criteria
Insurance certification
Pre-purchase examination of horses

Learning and Teaching Strategies/Activities

Blended teaching model 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.

Student Assessment Strategies

Continuous Assessment: 100% (minimum 1 theory and 1 practical assessment).

Learning and Teaching Enhancement Strategies

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

Learning resources:

1. Robinson's Current Therapy in Equine Medicine 7th Edition, K.A.Sprayberry; N.E.Robinson
2. FEI Identification of Horses. 3rd. Edition 1997 Printed in Switzerland for the FEI.

Module Title: INTRODUCTION TO JURISPRUDENCE (2023 and 2024 only)	
Module Code	V3820AJ
NQF Level	8
Notional Hours	20
Contact hours	Lectures: 1x 1hr lectures / week for 5 weeks
Additional learning requirements	None
NQF Credits	2
(Co-requisites) **Prerequisite**	None
Compulsory/Elective	Compulsory
Semester Offered	CS5
Module Purpose	
The purpose of this module is to provide the student with an overview of public policy, the formulation of legislation and the Namibian Constitution	
Overarching Learning Outcome	
Discuss the formulation of policy and legislation in terms of the Namibian Constitution.	
Specific Learning Outcomes	
On completing the 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. Interpret the Constitution of the Republic of Namibia	

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 and the Namibian Constitution.

Learning and Teaching Strategies/Activities

Through lectures, tutorials, class discussions

Student Assessment Strategies

Continuous assessment 100%. Minimum 2 theory assessments

Learning and Teaching Enhancement Strategies

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

Learning resources:

All the below Learning Resources are prescribed and will be made available to the students at no cost

1. Veterinary and Veterinary Para-Professions Act 1 of 2013, including supporting Regulations and Rules
2. Animal Health Act 1 of 2011 including supporting Regulations
3. Medicines and Related Substances Control Act 13 of 2003 including supporting Regulations, as well as the Amendment Act
4. Prevention of Undesirable Residues in Meat Act 11 of 2009 including supporting Regulations
5. The Constitution of the Republic of Namibia

Module Title: RESEARCH PROJECT	
Module Code	V3883AR
NQF Level	8
Notional Hours	300
Contact hours	Lectures: 2x 1hr lectures / week for 13 weeks per semester
Additional learning requirements	Project, field and laboratory activities
NQF Credits	30
(Co-requisites) **Prerequisite**	(Research Methodology) Veterinary Epidemiology
Compulsory/Elective	Compulsory
Semester Offered	1 and 2 (year module)
Module Purpose	
The purpose of this module is to equip the student to complete a Research Project, on a relevant topic selected between the student and the supervisor, compile a written report upon successful completion of the project and give an oral presentation.	
Overarching Learning Outcome	
Conduct and complete a scientific research project on a chosen topic in any field of veterinary medicine under the guidance of a supervisor.	
Specific Learning Outcomes	
On completing the 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 related to veterinary medicine.

Learning and Teaching Strategies/Activities

Group or independent study and work

Student Assessment Strategies

Continuous Assessment 100%: Oral presentation (25%) and written research report (75%)

Learning and Teaching Enhancement Strategies

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 and oral presentations
- Student evaluation of the module and lecturers at the end of the semester
- Regular reviews of module content

Prescribed Learning Resources

There are no specific prescribed textbooks for this module. The supervisor will guide the student on how to get the most important reference material for the project. As an example, these could be laboratory manuals or protocols.

Module Title: COMPANION ANIMAL CLINICAL STUDIES II	
Module Code	V3833CC
NQF Level	8
Notional Hours	400
Contact hours	Lectures: 4x 1hr lectures / week for 13 weeks per semester Practical: 1x 3hr practical / week for 13 weeks per semester
Additional learning requirements	None
NQF Credits	40
(Co-requisites) **Prerequisite**	Companion Animal Clinical Studies I
Compulsory/Elective	Compulsory
Semester Offered	1 and 2 (year module)

Module Purpose

The purpose of this module is to prepare 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, emergency care and trauma, ophthalmology and multi-systemic diseases. Each student will assist with anaesthesia and surgery (ovariohysterectomy) of a canine patient.

Overarching Learning Outcome

Implement a structured problem-solving approach to clinical cases in small companion animals.

Specific Learning Outcomes

On completing the 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 stabilize emergency conditions and traumatic injuries
9. Discuss the diagnosis and treatment of ophthalmological conditions in dogs and cats
10. Describe how to anaesthetize 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. Assist with both anaesthesia and surgery in a dog or cat

Module Content

Main Topics: Pathophysiology; Diagnosis; Clinical Management; Best Treatment Options of disease processes affecting various organ systems and species as outlined above.
Subtopics: Medicine; Surgery; Applied Clinical Pathology; Applied Diagnostic Imaging; Clinical Diagnostics; Assist Anaesthesia; Assist Ovario-hysterectomy; Emergency treatment; Critical Care; Dental Procedures.
In this is a multi-disciplinary module the above main topics and subtopics are integrated to equip the student with a holistic blended approach to the diagnosis, treatment and prevention of diseases in small animal patients.
The module content is in compliance with the requirements of current Namibian veterinary legislation and subject to audit by the Namibian Veterinary Council.

Learning and Teaching Strategies/Activities

Through blended 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.
Case studies form an integral part of the blended lectures and practicals.

Student 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

Examination: 1 x 3hr integrated written 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%.

Learning and Teaching Enhancement Strategies

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, practicals, tests and examinations

Prescribed Learning Resources

Prescribed textbooks:

1. Ettinger, SJ, Feldman, EC & Côte, E, 2017, Textbook of veterinary internal medicine, 8th edn, Elsevier.
2. Fossum, TW, et al. 2018, Small Animal Surgery, 5th edn, Elsevier.

Additional resources:

1. Tobias, KM & Johnston, SA 2018, Veterinary Surgery: Small Animal, 2nd edn, Elsevier.
2. Thrall, M. A., Weiser, G., Allison, R. W., & Campbell, T. W. (Eds.). (2012). Veterinary hematology and clinical chemistry. John Wiley & Sons.
3. Thrall, DE 2013, Textbook of veterinary diagnostic radiology, 6th edn, Elsevier.
4. B. Niemiec; Small Animal Dental, Oral and Maxillofacial Disease; Manson Publishing for dentistry
5. S. Platt; Small Animal Neurology; Schlütersche for neurology
6. S. Johnston; Veterinary Ophthalmology 2nd Edition; Elsevier for ophthalmology
7. S. Fitzmaurice; Saunders Solutions in Veterinary Practice: Small Animal Neurology
8. M. Schaer; Clinical Signs in Small Animal Medicine; CRC Press
9. C.J. Henry; Cancer Management in Small Animal Practice; Saunders Elsevier
10. eClinpath.com A Resource for Veterinary Clinical Pathology; Cornell University College of Veterinary Medicine

Module Title: THERIOGENOLOGY IV	
Module Code	V3843PT
NQF Level	8
Notional Hours	200
Contact hours	Lectures: 2x 1hr lectures / week for 13 weeks per semester Practical: 1x 3hr practical / alternate week for 13 weeks per semester
Additional learning requirements	None
NQF Credits	20
(Co-requisites) **Prerequisite**	(Theriogenology III) Theriogenology I Theriogenology II
Compulsory/Elective	Compulsory
Semester Offered	1 and 2 (year module)

Module Purpose

The purpose of this module is to develop 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.

Overarching Learning Outcome

Assist the female animal with normal breeding practices and address unwanted abnormalities.

Specific Learning Outcomes

On completing the module students should be able to:

1. Discuss the physiology of pregnancy, parturition and puerperium 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 animal species and recognize abnormal pregnancy and apply corrective measures
4. Induce abortion and parturition in selected domestic animal species
5. Manage dystocia and post-partum disorders of the female companion animal including foetotomy and caesarean section
6. Detect and manage infectious and non-infectious diseases and disorders of the male and female companion animal's reproductive systems emphasizing causes of abortion
7. Perform ultrasound examination for pregnancy examinations

8. Perform various methods of assisted animal reproduction (including artificial insemination)

Module Content

Principles of assisted animal reproduction in livestock and equines: breeding soundness examination; semen collection and processing; reproductive cycle synchronization; artificial insemination; embryo transfer.

Learning and Teaching Strategies/Activities

Blended teaching model through integrated lectures, class discussions and practical

Student 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 practical 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%).

Learning and Teaching Enhancement Strategies

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 test and practical.

Prescribed Learning Resources

Prescribed textbooks:

1. Current therapy in Large Animal Theriogenology by Robert S Young and Walter R. Threlfall
2. Veterinary Reproduction and Obstetrics Ninth Edition by David E Noakes, Timothy J. Parkinson and Gary C.W. England

Additional resources:

1. Veterinary Obstetrics and Genital diseases by Stephen J. Roberts
2. Pathways to Pregnancy and Parturition. Second Edition. P.L. Senger Ph.D.
3. McDonald's Veterinary Endocrinology and Reproduction Fifth Edition edited by Maurico H. Pineda and Michael P. Dooley

4. Equine Breeding Management and Artificial Insemination by Juan. Samper; Second Edition
5. Practical Manual of Veterinary Gynaecology & Obstetrics by Madhu Shivare, M.S. Thakur, S.P. Shukla
6. Canine and Feline Endocrinology and Reproduction (Third edition) by E.C. Feldman and RW Nelson (2003) WB Saunders Company, 1104pp
7. Breeding is a Bitch by KMG de Cramer

Module Title: PRODUCTION ANIMAL CLINICAL STUDIES IV	
Module Code	V3851PP
NQF Level	8
Notional Hours	190
Contact hours	Lectures: 4x 1hr lectures / week for 13 weeks Practical: 1x 3hr practical / alternate week for 13 weeks
Additional learning requirements	None
NQF Credits	19
(Co-requisites) **Prerequisite**	(Production Animal Clinical Studies V) Production Animal Clinical Studies I Production Animal Clinical Studies II Production Animal Clinical Studies III
Compulsory/Elective	Compulsory
Semester Offered	1

Module Purpose

The purpose of this module is 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.

Overarching Learning Outcome

Discuss aetiology, pathogenesis, clinical and post-mortem findings, diagnosis, prevention, treatment and control of important diseases / conditions of the relevant systems of cattle as well diseases / conditions of sheep and goats.

Specific Learning Outcomes

On completing the module students should be able to:

1. Discuss the aetiology, pathogenesis and differential diagnoses of important diseases of ruminants related to the relevant systems
2. Diagnose and treat relevant diseases of ruminants
3. Describe the anaesthesia of ruminants using appropriate drugs
4. Describe selected surgeries of ruminants
5. Administer veterinary drugs for treatment in ruminants
6. Manage and care for ruminant patients

Module Content

Common disorders of the major body systems of cattle, sheep and goats: clinical signs, diagnostic tests and treatment options for disorders of individual animals as well as herds and flocks; preventative care and selected surgical procedures.

Musculoskeletal diseases
Neurology
Dermatology
Urology
Nephrology

Learning and Teaching Strategies/Activities

Blended teaching model through integrated lectures, class discussions and practicals

Student Assessment Strategies

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

Examination: 1x 3hr integrated paper, and a 15 minutes practical examination

Learning and Teaching Enhancement Strategies

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

Prescribed Learning Resources

Prescribed textbooks:

1. Infectious diseases of Livestock; J Coetzer, G Thomson, R. Tustin
2. Veterinary Medicine; A textbook of diseases of cattle, horses, sheep, pigs and goats; 10th edition

Module Title: WILDLIFE CLINICAL STUDIES III	
Module Code	V3801PW
NQF Level	8
Notional Hours	100
Contact hours	Lectures: 2x 1hr lectures / week for 13 weeks Practical: 1x 3hr practical / alternate week for 13 weeks
Additional learning requirements	One (1) full field training/practical week (40 hours)
NQF Credits	10
(Co-requisites) **Prerequisite**	Wildlife Clinical Studies I Wildlife Clinical Studies II
Compulsory/Elective	Compulsory
Semester Offered	1

Module Purpose

The purpose of this module is to equip the student with the knowledge and clinical skills to be able 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"

Overarching Learning Outcome

The successful student will have deepened, comprehensive and systemic expertise in the chemical restraint, from beginning to end, of the majority of commonly managed wildlife species in Namibia.

Specific Learning Outcomes

On completing the module students should be able to:

1. Describe basic physiology and pharmacology as it relates to the chemical restraint of wild animals
2. List, describe and discuss the use of drugs used for chemical restraint 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
3. Explain potential side effects of drugs commonly used for the chemical restraint of wild animals and how to deal with these side effects
4. Demonstrate appropriate first aid in the case of accidental human exposure to S5 drugs

5. Describe how to maintain appropriate records of S5 drugs as described by Namibian legislation
6. Describe the Namibian legislation regulating the use of Schedule 5 drugs in Namibia
7. Demonstrate the safe and effective use of a remote delivery device and projector (dart gun) in order to induce the immobilisation of the wild animal.
8. Safely and effectively induce immobilisation, manage and recover the wild animal using appropriate veterinary medicines for its capture, care and transport, with particular emphasis on Schedule 5 drugs

Module Content

Physiology for Chemical Restraint: nervous, cardiovascular, gastrointestinal, respiratory systems
Pharmacology for Wildlife
Specific Chemical Restraint Veterinary Medicines

Opioids: Agonists: etorphine, fentanyl, thiafentanil (carfentanil); Mixed agonists/antagonists: butorphanol (nalbuphine, nalorphine); Antagonists: diprenorphine, naltrexone, naloxone

Cyclohexylamines: Dissociative anaesthetics (ketamine and tiletamine); combinations (ketamine/medetomidine; tiletamine/zolazepam)

Sedatives & Tranquilizers: azaperone; haloperidol; zuclopenthixol; perphenazine; diazepam, midazolam; zolazepam; xylazine, detomidine, medetomidine; romifidine

Other Game Capture Vet meds: depolarising neuromuscular blockers; non-depolarising neuromuscular blockers; Doxapram; Hyaluronidase; Biperidine; oxygen; analgesics and anti-inflamatories (meloxicam)

Accidental Human Exposure: appropriate first aid in the case of accidental human exposure to S5 drugs
Megaherbivores capture, care and transport
Antelope capture, care and transport
Carnivores capture, care and transport
Monitoring Immobilisation
Responding to Critical Immobilisation Scenarios
Humane Euthanasia of Wildlife
Wildlife Legislation in Namibia & Record Keeping for wildlife in Namibia
Wildlife Ethics

Learning and Teaching Strategies/Activities

Blended teaching model through integrated lectures, practicals and an extended field trip

Student Assessment Strategies

Continuous Assessment: Test 1 and 2 (35% each); Dosage calculations (5%); Basic Life Support (10%); Field Trip (15%). Additionally there may be adhoc quizzes, debates, class discussions

Examination: Theory Paper: 1x 2hr paper (75% of final exam points); Practical: 1x 2hr practical exam (25% of final exam points)

Learning and Teaching Enhancement Strategies

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 student supervision and monitoring of assignments, tests and examinations

Prescribed Learning Resources

Prescribed textbooks:

1. Chemical and Physical Restraint of Wild Animals – Mike Kock & Richard Burroughs (2nd Ed -2012) ISBN 978-062052162-8 IWVS Africa (1st Ed in Libabry)
2. The Capture and Care Manual: Capture, Care, Accomodation and Transport of wild African animals. Ed; Andre A. Mckenzie. Pub: Widlife decision Support Services 1993 ISBN: 0620176083, 9780620176088
3. The Capture, Care and Management of Wildlife – Mike la Grange (1st Ed-2006) ISBN 0 627 026117 Van Schaik

Module Title: EQUINE CLINICAL STUDIES	
Module Code	V3823CH
NQF Level	8
Notional Hours	200
Contact hours	Lectures: 2x 1hr lectures / week for 13 weeks per semester Practical: 1x 3hr practical / alternate week for 13 weeks per semester
Additional learning requirements	Field trips to equine establishments
NQF Credits	20
(Co-requisites) **Prerequisite**	(Introduction to Equine Clinical Studies) Veterinary Parasitology I Veterinary Parasitology II Veterinary Pharmacology Veterinary Toxicology II Veterinary General Surgery Veterinary Diagnostic Imaging Clinical Diagnostics Systemic Pathology
Compulsory/Elective	Compulsory
Semester Offered	1 and 2 (year module)

Module Purpose

The purpose of this module is 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.

Overarching Learning Outcome

Examine, diagnose and treat relevant equine disorders.

Specific Learning Outcomes

On completing the 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

Diagnosis, treatment and control of conditions and diseases affecting the various organ systems of the horse.
Infectious and parasitic diseases, clinical diagnostics, clinical pathology, diagnostic imaging, medical and surgical treatment options as well as preventative measures.
Gastro-enteric, cardio-vascular, urinary and respiratory diseases and conditions.
Musculoskeletal disorders: incidence; pathophysiology; and diagnosis of lameness.
Equine dentistry: comprehensive dental examination; routine floating of teeth.
Neurology: neurological examination.
Disorders affecting the central and peripheral nervous systems
Dermatology: diseases of the skin and hooves.
Common disorders of the haemolymphatic system
Ophthalmology: systematic examination of the eye; most common disorders.
Oncology: basic diagnosis and treatment of important equine neoplasms.
Endocrinology: most relevant endocrine conditions.

Learning and Teaching Strategies/Activities

Blended teaching model through integrated 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. Lectures can either be face-to-face on online.

Student Assessment Strategies

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

Examination: 1 x 3hr written 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%.

Learning and Teaching Enhancement Strategies

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, tests and examinations
- Internal and External moderation of examination papers and scripts

Prescribed Learning Resources

Prescribed textbooks:

1. Robinson's Current Therapy in Equine Medicine 7th Edition, K.A.Sprayberry; N.E.Robinson
2. Lameness in Horses 6th Edition, Adams and Stashak

Additional resources:

1. Equine Dermatology 2nd Edition, D.W.Scott; W.H.Miller
2. Equine Surgery 4th Edition, J.A.Auer; J.A.Stick
3. Equine Neurology 2nd Edition, M.Furr; N.Reed
4. Diagnosis and Management of Lameness in the Horse 2nd Edition, M.W.Ross; S.J.Dyson
5. Principles of Equine Dentistry, David O. Klugh

Module Title: HERD HEALTH MANAGEMENT & ECONOMICS I	
Module Code	V3821PH
NQF Level	8
Notional Hours	100
Contact hours	Lectures: 2x 1hr lectures / week for 13 weeks Practical: 1x 3hr practical / alternate week for 13 weeks
Additional learning requirements	Feedlot challenge and full day field trips
NQF Credits	10
(Co-requisites) **Prerequisite**	Animal Ethology Animal Welfare Veterinary Parasitology I Veterinary Parasitology II Veterinary Immunology & Vaccinology Animal Production
Compulsory/Elective	Compulsory
Semester Offered	1

Module Purpose

The purpose of this module is to introduce principles of herd health and reproductive management, to optimize production and health in beef cattle as well as small stock. It similarly aims to explain the role animal health economics in the decision-making processes.

This module addresses herd health aspects and economics required by veterinarians to provide the necessary advice and consulting.

Overarching Learning Outcome

Apply principles of heard health and reproductive management in order to optimise production in beef cattle and small stock.

Specific Learning Outcomes

On completing the module students should be able to:

1. Identify factors contributing to poor health and production, bovines small stock
2. Discuss the importance of body condition scoring in evaluating herd & 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. Discuss the importance of keeping proper herd health records
8. Economic importance and contribution of the livestock sector in the Namibian economy

9. Analyse economic problems using basic methods such as partial budgeting, cost-benefit analysis and decision analysis

Module Content

Herd Health Management: aspects of herd/flock health, production and reproduction management programmes in cattle and small stock; management of replacement rearing, milk production, herd fertility, and nutrition in cattle; flock health, nutrition and production management of small stock; biosecurity measures and the containment of diseases.
Animal Health Economics: importance of animal diseases in efficiency of animal production; consumer's perception of animals and animal products; global trade; analysis of economic problems using basic methods such as partial budgeting, cost- benefit analysis and decision analysis; critical steps in systems analysis and appropriate modelling types and techniques, e.g. headmaster; implementation and evaluation of animal health programmes; policy development and implementation process.

Learning and Teaching Strategies/Activities

Blended teaching model through integrated lectures and practicals and participate in feedlot challenge.

Student Assessment Strategies

Minimum 2 theory assessments through written test (30% each), 3 marked practical assessments (40%) for CA Mark.

Examination: 1x 2hr theory paper

Learning and Teaching Enhancement Strategies

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

Prescribed Learning Resources

Prescribed textbooks:

1. Chenoweth PJ, Saunderson M W 2005 Beef practise: Cow-calf production medicine. Blackwell publishing
2. Herd Heath, Food Animal Production Medicine, 3rd Edition; Radostits OM

Additional resources:

1. Herd Heath, Food Animal Production Medicine, 2nd Edition; Radostits Leslie Fetrow
2. Fields MJ, Sand R J(Eds) 1994 Factors affecting calf crop.CRC Press
3. Small Stock Diseases: De Wet JAL & Bath GF
4. Diseases and Parasites of Cattle, Sheep and Goats in South Africa. P Oberem D Odendaal PT Oberem MGS Snyman L Ludwig H Mynhardt
5. Vaccines and Immunisation of Farm Animals; Jan du Preez and Faffa Malan.
6. Veterinary Medicine: Blood DC, Radostits OM & Henderson JA,6th edition
7. University of Pretoria: Veterinary Science: BHP 500 notes

Module Title: PRODUCTION ANIMAL CLINICAL STUDIES V	
Module Code	V3872PP
NQF Level	8
Notional Hours	190
Contact hours	Lectures: 4x 1hr lectures / week for 13 weeks Practical: 1x 3hr practical / alternate week for 13 weeks
Additional learning requirements	None
NQF Credits	19
(Co-requisites) **Prerequisite**	(Production Animal Clinical Studies IV) (Herd Health Management & Economics I) Production Animal Clinical Studies I Production Animal Clinical Studies II Production Animal Clinical Studies III
Compulsory/Elective	Compulsory
Semester Offered	2

Module Purpose

The purpose of this module is 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**.

Overarching Learning Outcome

Discuss aetiology, pathogenesis, clinical and post-mortem findings, diagnosis, prevention, treatment and control of important diseases / conditions of the relevant systems of cattle as well diseases / conditions of sheep and goats.

Specific Learning Outcomes

On completing the module students should be able to:

1. Discuss the aetiology, clinical signs, pathogenesis, diagnosis, differential diagnoses and treatment, control and prevention 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
6. Perform basic practical procedures in ruminants

Module Content

Common disorders of the major body systems of cattle, sheep and goats: clinical signs; diagnosis, differential diagnosis formulation and treatment options for disorders of individual animals as well as herd management; preventative care and selected surgical procedures.
Ruminant cardio-respiratory diseases: important respiratory and cardiovascular diseases of cattle; basic diagnostic and therapeutic procedures
Important diseases and conditions of sheep and goats.

Learning and Teaching Strategies/Activities

Blended teaching model through integrated lectures, class discussions and practicals

Student Assessment Strategies

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

Examination: 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%.

Learning and Teaching Enhancement Strategies

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

Prescribed Learning Resources

Prescribed textbooks:

1. Radostits, Gay, Hinchcliff & Constable, (2007) Veterinary Medicine: A textbook of diseases of cattle, horses, sheep, pigs, and goats. 10th Edition.
2. Bradford P. Smith, (2015). Large animal internal medicine. 5th Edition.

Additional resources:

1. N. Kent Ames, (2013). Noordsy's Food Animal Surgery. 5th Ed.
2. Dean A. Hendrickson & AN Baid, (2013). Techniques in large animal surgery. 4th Ed. Wiley Blackwell
3. Reece et al., (2015). Duke's physiology of domestic animals. 13th Edition.
4. J.A.W. Coetzer, G.R. Thomson, R.C. Tustin, (1994). Infectious Diseases of Livestock with special reference to Southern Africa. Oxford University Press
5. Divers,T. and Peek, S., (2007). Rebhun's Diseases of Dairy Cattle 2nd Edition. Saunders.

Electronic books:

1. Hendrickson, D.A. and Baird, A.N. (2013). Turner's and McIlwraith's Techniques in Large Animal Surgery. 4th Edition. Wiley Blackwell. Available at: https://www.perlego.com/book/1000245/turner-and-mcilwraiths-techniques-in-large-animal-surgery-pdf Accessed on 16 May 2021
2. Abbott, K. (2019). The Practice of Sheep Veterinary Medicine. Available at: https://www.researchgate.net/publication/328665218_The_Practice_of_Sheep_Veterinary_Medicine Accessed on 16 May 2021

HTML links:

1. https://www.merckvetmanual.com/
2. https://www.oie.int/en/what-we-do/standards/codes-and-manuals/
3. https://www.cfsph.iastate.edu/Species/bovine/
4. https://www.cfsph.iastate.edu/Species/small-ruminants/

Module Title: HERD HEALTH MANAGEMENT & ECONOMICS II	
Module Code	V3822PH
NQF Level	8
Notional Hours	100
Contact hours	Lectures: 2x 1hr lectures / week for 13 weeks Practical: 1x 3hr practical / alternate week for 13 weeks
Additional learning requirements	Full day field trips
NQF Credits	10
(Co-requisites) **Prerequisite**	(Herd Health Management & Economics I) Animal Ethology Animal Welfare Veterinary Parasitology I Veterinary Parasitology II Veterinary Immunology & Vaccinology Animal Production
Compulsory/Elective	Compulsory
Semester Offered	2

Module Purpose

The purpose of this module is to introduce principles of herd health and reproductive management, to optimize production and health in dairy cattle. Biosecurity measures will also be addressed. It similarly aims to explain the role animal health economics in the decision-making processes. This module addresses herd health aspects and economics required by veterinarians to provide the necessary advice and consulting.

Overarching Learning Outcome

Apply principles of heard health and reproductive management in order to optimise production in dairy cattle.

Specific Learning Outcomes

On completing the module students should be able to:

1. Identify factors contributing to poor health and production, dairy cattle
2. Discuss the importance of body condition scoring in evaluating herd & flock performance
3. Recommend management strategies for new born animals, weaners and adults
4. Assess factors and recommend management strategies for controlling mastitis in herds.
5. Evaluate the objective of dry period management in the production cycle of cows
6. Determine and predict metabolic diseases based on rumen activity
7. Evaluate herd fertility performance based on different parameters

8. Evaluate feeding strategies and ration balancing in relation to negative energy balance minimization
9. Recommend correct biosecurity measures to ensure optimum health of livestock
10. Explain the importance of keeping proper herd health records
11. Apply hoof management
12. Evaluate the economic importance and contribution of the livestock sector in the Namibian economy
13. Analyse economic problems using basic methods such as partial budgeting, cost-benefit analysis and decision analysis

Module Content

Herd Health Management: herd/flock health, production and reproduction management programmes in dairy cattle; management of replacement rearing, dry period, milk production, herd fertility, udder health and nutrition; biosecurity measures and the containment of diseases
Animal Health Economics: importance of animal diseases in efficiency of animal production; consumer's perception of animals and animal products; global trade; analysis of economic problems using basic methods such as partial budgeting, cost- benefit analysis and decision analysis; critical steps in systems analysis and choose appropriate modelling types and techniques, e.g., headmaster; implementation and evaluation of animal health programmes, and policy development and implementation process.

Learning and Teaching Strategies/Activities

Blended teaching model through integrated lectures and practicals

Student Assessment Strategies

Minimum 2 theory assessments through written test (30% each), 3 marked practical assessments (40%) for CA Mark.

Examination: 1 x 2hr theory paper.

Learning and Teaching Enhancement Strategies

The quality and standards of learning and teaching will be improved through:

- Module review in consultation with experts
- Internal and external moderation of examination papers
- Lecturer and student evaluation or the module at the end of the semester
- Regular reviews of module content
- Effective supervision and monitoring of assignments, test and examinations

Prescribed Learning Resources

Prescribed textbooks:

1. Dairy herd Health, Martin Green.
2. Herd Heath, Food Animal Production Medicine, 3RD Edition; Radostits OM

Additional resources:

1. Herd Heath, Food Animal Production Medicine, 2ND Edition; Radostits Leslie Fetrow
2. Diseases and Parasites of Cattle, Sheep and Goats in South Africa. P Oberem D Odendaal PT Oberem MGS Snyman L Ludwig H Mynhardt
3. Vaccines and Immunisation of Farm Animals; Jan du Preez and Faffa Malan.
4. Veterinary Medicine : Blood DC, Radostits OM & Henderson JA,6th edition
5. University of Pretoria: Veterinary Science: BHP notes

Module Title: VETERINARY LEGISLATION	
Module Code	V3842AJ
NQF Level	8
Notional Hours	90
Contact hours	Lectures: 2x 1hr lectures / week for 13 weeks
Additional learning requirements	None
NQF Credits	9
(Co-requisites) **Prerequisite**	Introduction to Jurisprudence
Compulsory/Elective	Compulsory
Semester Offered	2
Module Purpose	
The purpose of this module is to provide the student with a thorough understanding of the important Acts, Regulations and Rules, which directly regulate the day-to-day activities of veterinary professionals; to provide the student with a thorough appreciation of veterinary professionalism; to foster a culture veterinary ethical conduct in the students.	
Overarching Learning Outcome	
Know and apply relevant Veterinary legislation in Namibia.	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Know and apply the relevant legislation as related to the practice of veterinary medicine in Namibia 2. Explain the role of jurisprudence in the practice of veterinary medicine 3. Understand and apply veterinary ethics and distinguish between unethical and unprofessional conduct	

Module Content

Namibian legislation: regulating the veterinary profession; veterinary medicines; animal health; certification; animal welfare trade in animals and animal products in Namibia.
Legislation governing the practice of veterinary medicine by professionals and para-professionals: the code of conduct; veterinary ethics; rules and standards. Specific Acts: The Veterinary and Veterinary Para-professions Act 1 of 2013, including related Regulations and Rules; The Animal Health Act 1 of 2011 including related Regulations; The Prevention of Undesirable Residue in Meat Act 21 of 1991; The Medicines and Related Substances Control Act 13 of 2003, including related Regulations as amended; The Animal Protection Act 71 of 1962

Learning and Teaching Strategies/Activities

Through lectures, tutorials, class discussions

Student Assessment Strategies

Continuous assessment: Minimum 2 theory assessments

Examination: 1x 2hr theory paper (100 marks)

Learning and Teaching Enhancement Strategies

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

Prescribed Learning Resources

All the below Learning Resources are prescribed and will be made available to the students at no cost

1. Veterinary and Veterinary Para-Professions Act 1 of 2013, including supporting Regulations and Rules
2. Animal Health Act 1 of 2011 including supporting Regulations
3. Medicines and Related Substances Control Act 13 of 2003 including supporting Regulations, as well as the Amendment Act
4. Prevention of Undesirable Residues in Meat Act 11 of 2009 including supporting Regulations
5. The Constitution of the Republic of Namibia

Module Title: CLINICAL ROTATIONS	
Module Code	V3883FY
NQF Level	8
Notional Hours	2250
Contact hours	48 weeks, all practical
Additional learning requirements	All practical training in different clinical rotations
NQF Credits	225
(Co-requisites) **Prerequisite**	BVM V
Compulsory/Elective	Compulsory
Semester Offered	1 and 2 (year module)
Module Purpose	
The purpose of this module is to develop and enhance the clinical skills of students to enable them to attain the OIE recommended "Day 1 competencies" as well as fulfil the Namibian Veterinary Council requirements. The rotations will be done under supervision of unconditionally registered veterinarians and other professionals.	
Overarching Learning Outcome	
Comply with all 'Day 1 competencies' of a Veterinarian as recommended by the OIE and stipulated in Namibian legislation.	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Competently perform all the "Day 1 competencies" for a veterinarian as recommended by the World Organisation for Animal Health (OIE) and the Namibian Veterinary Council (NVC)	

Module Content

Intensive clinical rotation for 1 year: each student will be exposed to various rotations under supervision of trained registered professional veterinarians and other experts in their fields to develop their clinical skills and attain their "Day One Competencies" as recommended by the OIE and NVC. 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.

Module code	Module name	NQF Level	Credits	Weeks	(Co-requisites) / Pre-requisites	Compulsory (C) / Elective (E)
Year 6						
V3883FY	CLINICAL ROTATION	8	225	48	BVM V	C
	Theriogenology (Equine, Bovine, Small stock and Canines)					C
	Cage Birds and Exotic Animal Clinic					C
	Veterinary Public Health (Abattoir, Food Safety Systems)					C
	Production Animal Clinic and Ambulatory Clinic					C
	Small Animal Surgery					C
	Cadaver Surgery					C
	Anaesthesiology and Pharmacology					C
	Equine Clinic					C
	Epidemiology					C
	Pathology and Parasitology					C
	Private Veterinary Practice					C
	State Veterinary Practice					C
	Companion Animal Clinic					C
	Mobile Animal Clinic					C
	Medicine Online					C
	Diagnostic Imaging (Radiography, Ultrasonography)					C
	Animal Welfare Clinic					C
	Isolation Clinic					C
	Outpatients Clinic					C
	Elective Rotation (Onderstepoort VAH, Wildlife, Mobile Animal Clinic, Equine, Student preference)					E
	Revisit (Repeat any of above)					C

	Veterinary Association of Namibia Congress					C
Total credits YEAR 6						**225**

Learning and Teaching Strategies/Activities

Clinical module, in which the students will be exposed to hands-on veterinary practical training in various clinical rotations, in groups of three to four students at a time. Students also have an opportunity to choose an elective component within the module in order to gain a more in-depth exposure to topics of individual preference.

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 and exotic animals; 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. **Veterinary Public Health 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. **Veterinary Public Health 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 40% and practical 40%, except for Epidemiology and Regulatory Medicine where a pass of 50% is required.
A pass mark of 50% is required for each of the four sections (Companion Animals, Production Animals, Veterinary Public Health / Pathology, and Epidemiology / Regulatory Medicine).

Final calculation of exam mark: Average of the four sections.
Final mark: 50% continuous assessment (log book plus clinical rotations) and 50% Exam mark
Pass mark: 50%.
Fatal flaw concept applies to Pregnancy diagnoses, Anaesthesiology and Surgery.

Candidates with a final mark of 45-49%, or 45-49% in any of the four sections with a maximum of two sections, will be invited to a supplementary oral examination concentrating on the failed section(s). (NVC regulation)
Candidates who achieve a final mark below 45%, including those who fail the supplementary oral examination, will repeat relevant rotations and / or lectures, and rewrite the failed section(s) in the midyear examination period.

Learning and Teaching Enhancement Strategies

The various clinical rotations are continuously reviewed and lecturer/student evaluations are used to inform the changes that are needed. Students' performance is constantly monitored through formative assessment marks. All the theory and practical components of the examinations are subject to internal and external moderation.

Prescribed Learning Resources

All resources provided in BVM I to BVM V modules, since this is an all-practical year (clinical rotations).

Module Title: BACHELOR OF VETERINARY MEDICINE INTERNSHIP	
Module Code	V3882FI
NQF Level	8
Notional Hours	240
Contact hours	8 weeks, all practical
Additional learning requirements	All practical training in different clinical rotations
NQF Credits	24
(Co-requisites) **Prerequisite**	Veterinarian with Namibian Veterinary Council (NVC) Temporary Registration and admission to NVC Board examination
Compulsory/Elective	Elective (Graduates from other Veterinary Faculties)
Semester Offered	2

Module Purpose

The purpose of this module is to develop and enhance clinical skills of veterinarians, to assist them to prepare for the Namibian Veterinary Council board examination for unconditional registration. The internship will be done under supervision of academics and registered veterinarians at the University of Namibia.

Overarching Learning Outcome

Comply with selected 'Day 1 competencies' of a Veterinarian as recommended by the OIE and stipulated in Namibian legislation.

Specific Learning Outcomes

On completing the module students should be able to:

1. Perform selected "Day 1 competencies" for a veterinarian as recommended by the OIE and NVC
2. Discuss and apply of Namibian veterinary legislation
3. Perform a qualitative import risk analysis
4. Plan, investigate and respond to selected disease outbreaks
5. Diagnose and treat selected commonly occurring animal diseases in Namibia
6. Perform selected basic surgical and anaesthesia on selected animal species
7. Conduct ante and post mortem inspection of livestock
8. Define and evaluate the most common food safety systems

Module Content

Each student will be required to attend a number of clinical and theoretical procedures.

Module code	Module name	NQF Level	Credits	Weeks	(Co-requisites) / Pre-requisites	Compulsory (C) / Elective (E)
Bachelor of Veterinary Medicine Internship						
V3882FI	VETERINARY INTERNSHIP Small Animal Surgery and Anaesthesiology, Equine Clinic, Production animal Clinic, Pathology, Mobile and Ambulatory clinics, Theriogenology, Veterinary Public Health, Epidemiology, Jurisprudence	8	24	8	Veterinarian with NVC Temporary Registration and admission to NVC Board examination	E
Total credits Bachelor of Veterinary Medicine Internship						**24**

Student Assessment Strategies

There will be no formal assessment at UNAM. Candidates will write the Namibian Veterinary Council Board examination.

www.unam.edu.na

Prospectus 2023