FACULTY OF HEALTH SCIENCES &
VETERINARY MEDICINE

School of Veterinary Medicine

Prospectus 2024

UNIVERSITY OF NAMIBIA

PROSPECTUS 2024

SCHOOL
OF
VETERINARY MEDICINE

NOTE

This Prospectus is only valid for 2024 as regulations and syllabi may be amended for 2024. 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 06 December 2023.

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 2024.

This Prospectus must be read in conjunction with the *General Information and Regulations Prospectus 2024*.

UNAM CORE DATES 2024

FIRST SEMESTER:

11 January	University Opens
23 January	Academic staff resumes office duties
23 January	Lectures commence for CORE SEMESTER – New Curriculum Senior Students of Professional Programmes (Until 1 March)
29 January	Lectures commence for CORE SEMESTER – New Curriculum (Until 1 March)
12 February	Lectures commence for FIRST SEMESTER – Old Curriculum Students (Until 15 May)
04 March	Lectures commence for FIRST SEMESTER – New Curriculum Students (Until 7 June), and New Curriculum Senior Students of Professional Programmes (Until 11 June)
25 March	Vacation Schools commence (Until 28 March)
28 March	FIRST SEMESTER NREAK for students commence (Until 2 April)
03 April	Lecturers commence after FIRST SEMESTER BREAK
12 May	Lecturers end for FIRST SEMESTER – Old Curriculum Students
22 May	First Opportunity Examinations commence – Old Curriculum Students (Until 10 June)
04 June	Lecturers end for FIRST SEMESTER – New Curriculum Students
10 June	First Opportunity Examinations end – Old Curriculum Students
10 June	First Opportunity Examinations commence - New Curriculum Students (Until 21 June)
11 June	Lecturers end for FIRST SEMESTER – New Curriculum Senior Students of Professional Programmes
11 June	Second Opportunity Examinations commence – Old Curriculum Students (Until 28 June)
17 June	First Opportunity Examinations commence – New Curriculum Senior Students of Professional Programmes (Until 28 June)
21 June	First Opportunity Examinations end – New Curriculum Students
24 June	Second Opportunity Examinations commence – New Curriculum Students (Until 5 July)
28 June	First Opportunity Examinations end – New Curriculum Senior Students of Professional Programmes
28 June	Second Opportunity Examinations end – Old Curriculum Students
01 July	Second Opportunity Examinations commence – New Curriculum Senior Students of Professional Programmes (Until 10 July)
05 July	Second Opportunity Examinations end – New Curriculum Students
10 July	Second Opportunity Examinations end – New Curriculum Senior Students of Professional Programmes
12 July	End of FIRST SEMESTER
15 – 19 July	Mid-year recess

SECOND SEMESTER

22 July	Lectures commence for SECOND SEMESTER – Old and New Curriculum Students (until 18 October), and New Curriculum Senior Students of Professional Programmes (Until 25 October)
26 August	SECOND SEMESTER BREAK for students commence (Until 31 August)
27 August	INSTITUTIONAL HOLIDAY
28 August	Vacation Schools commence (Until 30 August)
02 September	Lectures resume after second semester break
18 October	Lectures end for SECOND SEMESTER – Old and New Curriculum Students
23 October	First Opportunity Examinations commence – Old Curriculum Students (Until 11 November) and New Curriculum (Until 6 November)
25 October	Lectures end for SECOND SEMESTER – New Curriculum Senior Students of Professional Programmes
30 October	First Opportunity Examinations commence – New Curriculum Senior Students of Professional Programmes (Until 12 November)
06 November	First Opportunity Examinations end – New Curriculum Students
07 November	Second Opportunity Examinations commence – New Curriculum Students (Until 22 November)
11 November	First Opportunity Examinations end – Old Curriculum Students
12 November	First Opportunity Examinations commence – New Curriculum Senior Students of Professional Programmes
12 November	Second Opportunity Examinations commence – Old Curriculum Students (Until 29 November)
13 November	Second Opportunity Examinations commence – New Curriculum Senior Students of Professional Programmes (Until 22 November)
22 November	Second Opportunity Examinations end – All New Curriculum Students, including Senior Students of Professional Programmes
29 November	Second Opportunity Examinations end – Old Curriculum Students
06 December	End of SECOND SEMESTER
13 December	End of ACADEMIC YEAR
09 January 2025	University opens (2025 academic year)
21 January 2025	Academic staff resume office duties

DUE DATES FOR THE 2024 ACADEMIC YEAR

Cancellation Dates for 2024

CANCELLATION DATES	
DATE	**DESCRIPTION**
05 February	Last day to cancel core semester modules with 100% credit – New curriculum students
16 February	Last day to cancel core semester modules with 50% credit – New curriculum students
23 February	Last day to cancel core semester modules – New curriculum students
23 February	Last day to cancel Semester 1 and year modules with 100% credit – Old curriculum students
15 March	Last day to cancel first semester and year modules with 100% credit – New curriculum students
15 March	Last day to cancel first semester modules with 50% credit – Old curriculum students
12 April	Last day to cancel first semester and year modules with 50% credit – New curriculum students
30 April	Last day to cancel FIRST SEMESTER MODULES – All students.
08 July	Last day to cancel year modules with 50% credit – All students
09 August	Last day to cancel second semester with 100% credit – All students
02 September	Last day to cancel second semester with 50% credit – All students
30 September	Last day to cancel second semester and year modules – All Students

General Due dates for students – 2024 Academic Year

GENERAL DUE DATES FOR STUDENTS	
DATE	**DESCRIPTION**
17 January	Last day to apply for remark for the second semester and year modules of First and Second opportunity examinations of November 2023)
18 January	Last day to apply to write promotional examination
18 January	Last day to apply for the retention of continuous assessment (CA) marks
24 January	Last day to approve promotional examinations applications by Schools
09 February	Last day for application of module(s) exemptions – New Curriculum Students
09 February	Last day for approval of module(s) and qualification changes – New Curriculum Students
16 February	Last day for application of module(s) exemptions – Senior Students
16 February	Last day for approval of module(s) and qualification changes – Senior Students
23 February	Last day for approval of module(s) exemptions – New Curriculum Students
08 March	Last day for approval of module(s) exemptions – Senior Students
30 April	Last day to change offering types

STRUCTURE AND PERSONNEL OF THE SCHOOL

ACADEMIC STAFF BY DEAN'S OFFICE

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)

ACADEMIC STAFF BY DEPARTMENTS

DEPARTMENT of VETERINARY PRE-CLINICAL STUDIES (Neudamm Campus)
☎ (+264 61) 206 4001 🖷 (+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).
Associate Professor:	Dr O Madzingira: BVSc (University of Zimbabwe); MPhil (University of Zimbabwe); MMed Vet (University of Pretoria); PhD in Veterinary Science (University of Pretoria).
Senior Lecturer:	Dr B Kaurivi: BSc (Biology) (University of Namibia); BVSc (University of Zimbabwe); MVSc (University of Sidney); PhD (Massey University)
Lecturer:	Dr B Chiwome: BVSc (University of Zimbabwe)
Lecturer:	Dr S Chinyoka: MSc (Tropical Animal Health, University of Pretoria) BVSc (University of Zimbabwe, Zimbabwe)
Lecturer:	Dr E Muradzwika: BVSc (University of Zimbabwe)
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 C Ntahonshikira: BVM, MSc (National Agricultural University of Ukraine); PhD (Kiev Veterinary Research Institute)
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)
Lecturer:	Dr F Chitate: BVSc (University of Zimbabwe); MSc (University of Reading)
Lecturer:	Dr D Mudimba: BVSc (University of Zimbabwe)
Staff Development Fellow:	Dr Junior T Paulus: BVM (University of Namibia)
Staff Development Fellow:	Dr Eugene A Jacobs: BVM (University of Namibia)
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 4168 🖷 (+264 61) 206 4027 💻 araath@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)
Senior lecturer:	Dr L De Villiers: BSc, BVSc, MSc (University of Pretoria)
Adjunct Lecturer:	Prof J Schoeman: BVSC, MMedVet, PhD (University of Pretoria)
Adjunct Lecturer:	Dr V McClure: BVSc, M. Med. Vet (University of Pretoria)
Adjunct Lecturer:	Dr D Marggraff: BVSc (University of Pretoria)
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 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: BVM (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 (UNAM)

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: BVM (University of Namibia)
Clinician:	Dr A Herbert: DVM (University of Toulouse, France)
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)
Veterinary Nurse:	Sr M Loschke: Dip. Vet. Nursing (University of Pretoria)
Theatre Assistant:	Ms J. Shiingidwa: Dip. Animal Health (University of Namibia)

Diploma in Animal Health (Katima Mulilo Campus)

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Academic Coordinator:	Dr S Chinyoka BVSc (University of Zimbabwe), MSc Tropical Animal Health (University of Pretoria)
Associate Professor:	Dr O Madzingira: BVSc (University of Zimbabwe); MPhil (University of Zimbabwe); MMed Vet (University of Pretoria); PhD in Veterinary Science (University of Pretoria)
Lecturer:	Dr Esther Muradzikwa Agriculture Diploma (Unam) BVSc (University of Zimbabwe)
Lecturer:	Dr Simbarashe Chinyoka BVSc (University of Zimbabwe), MSc Tropical Animal Health (University of Pretoria)
Technologist:	Evelyn Mwenda B.Sc Double Major in Biology: Environmental Biology & Physiological and Molecular Biology (University of Namibia) B.Sc honors Microbiology (University of Namibia)
Paraprofessional:	Mr. Simasiku Nicky, Diploma in Animal Health (University of Namibia),

BACHELOR OF VETERINARY MEDICINE

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:

(c) 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

(d) 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.

(e) 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.

(f) 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.

(g) 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.

(h) 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.

(i) 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.

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.

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.

Minimum requirements for re-admission into the School / Programme

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.

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.

Advancement and progression rules

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

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

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

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

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.

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 1130 credits (students starting BVM I in 2023), and who have met all other relevant UNAM requirements.

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

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.

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 P: 6 (12 integrated)	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) V3581ES Veterinary Structure & Function I V3582ES Veterinary Structure & Function II	C
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	None	C

				P: 0.7		
Total Credits Semester 1						**74**
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) V3581ES Veterinary Structure & Function I V3582ES Veterinary Structure & Function II V3503EB Veterinary Biochemistry	C
V3622EW	Animal Welfare	6	8	L: 2 P: 1.5	(V3681ES Veterinary Structure & Function III) (V3601EE Animal Ethology)	C

					V3581ES Veterinary Structure & Function I V3582ES Veterinary Structure & Function II	
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
Total Credits Semester 2						**62**
Total credits YEAR 2						**161**

Module code	**Module name**	**NQF Level**	**Credits**	**Contact hours per week (L / P / T)**	**(Co-requisites) / Pre-requisites**	**Compulsory (C) / Elective (E)**
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	(V3722CC 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
V3763AT	Toxicology & Ethno-Vet Medicine	7	9	L: 2 P: 0.25	V3503EB Veterinary Biochemistry V3681ES Veterinary Structure & Function III V3682ES Veterinary Structure & Function IV (2024 only)	C
V3721CD	Veterinary Diagnostic Imaging	7	9	L: 2 P: 1.5	(V3722CC Clinical Diagnostics) V3681ES Veterinary Structure & Function III V3682ES Veterinary Structure & Function IV (2024 only)	C

V3721PF	Fish and Bee Medicine	7	9	L/T: 2	V3660EM Veterinary Microbiology I V3611EM Veterinary Microbiology II	C
V3721EV	Veterinary Professional Skills III	7	8	L: 0.3	None	C
Total Credits Semester 1						**96**
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	(V3722CC Clinical Diagnostics) V3503EB Veterinary Biochemistry V3681ES Veterinary Structure & Function III	C

					V3682ES Veterinary Structure & Function IV (2024 only)	
V3712AI	Infectious Diseases II	7	17	L: 4 P: 1.5	(V3711AI Infectious Diseases I) V3660EM Veterinary Microbiology I V3611EM Veterinary Microbiology II	C
V3722CC	Clinical diagnostics	7	9	L: 2 P: 1.5	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
V3702CA	Veterinary Anaesthesiology	7	9	L: 2 P: 1.5	V3681ES Veterinary Structure & Function III V3682ES Veterinary Structure & Function IV (2024 only)	C
V3763AT	Toxicology & Ethno-Vet Medicine	7	9	L: 2 P: 0.25	V3503EB Veterinary Biochemistry V3681ES Veterinary Structure & Function III V3682ES Veterinary Structure & Function IV (2024 only)	C
Total Credits Semester 2						**79**

Total credits YEAR 3	**175**

Module code	Module name	NQF Level	Credits	Contact hours per week (L / P / T)	(Co-requisites) / Pre-requisites	Compulsory (C) / Elective (E)
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: 1.5	(V3821CC Clinical Pathology) V3731AP Veterinary Parasitology I V3732AP Veterinary Parasitology II V3703AD Veterinary Pharmacology V3763AT Toxicology & Ethno-Vet Medicine V3711AI Infectious Diseases I V3712AI Infectious Diseases II	C

					V3701CS Veterinary General Surgery V3721CD Veterinary Diagnostic Imaging V3722CC Clinical Diagnostics	
V3831PA	Production Animal Clinical Studies I	8	19	L: 3 P: 1.5	(V3821CC Clinical Pathology) V3763AT Toxicology & Ethno-Vet Medicine V3711AI Infectious Diseases I V3712AI Infectious Diseases II V3722CC Clinical Diagnostics V3703AD Veterinary Pharmacology V372EAG General Pathology V3701CS General Surgery V3731AP Veterinary Parasitology I V3732AP Veterinary Parasitology II	C
V3823PR	Theriogenology I	8	10	L: 2 P: 1.5	V3711AI Infectious Diseases I V3712AI Infectious Diseases II V3722CC Clinical Diagnostics V3703AD Veterinary Pharmacology V3723AG General Pathology V3701CS General Surgery	C
V3863PC	Wildlife Clinical Studies I	8	10	L: 2 P: 1.5	V3711AI Infectious Diseases I V3712AI Infectious Diseases II V3722CC Clinical Diagnostics	C

					V3703AD Veterinary Pharmacology V3723AG General Pathology V3701CS General Surgery V3731AP Veterinary Parasitology I V3732AP Veterinary Parasitology II	
V3821CC	Clinical Pathology	8	10	L: 2 P: 1.5	V3722CC Clinical Diagnostics 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						**108**
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
V3822EV	Veterinary Professional Skills IV	8	9	L: 1	None	C
V3843AE	Veterinary Epidemiology	8	10	L: 2 P: 1.5	V3632EB Biometry V3711AI Infectious Diseases I V3712AI Infectious Diseases II	C
V3822AL	Field Practical Training: Laboratory	8	9	L/T: 0.75	V3660EM Veterinary Microbiology I V3611EM Veterinary Microbiology II V3731AP Veterinary Parasitology I V3732AP Veterinary Parasitology II V3763AT Toxicology & Ethno-Vet Medicine V3723AG General Pathology V3642EM Molecular Biology	C
V3823PR	Theriogenology I	8	10	L: 2 P: 1.5	V3711AI Infectious Diseases I V3712AI Infectious Diseases II V3722CC Clinical Diagnostics V3703AD Veterinary Pharmacology V3723AG General Pathology V3701CS General Surgery	C
V3832PA	Production Animal Clinical Studies II	8	20	L: 3 P: 3	(V3831PA Production Animal Studies I)	C

					(V3821CC Clinical Pathology) V3763AT Toxicology & Ethno-Vet Medicine V3711AI Infectious Diseases I V3712AI Infectious Diseases II V3722CC Clinical Diagnostics V3703AD Veterinary Pharmacology V3723AG General Pathology V3701CS General Surgery	
V3863PC	Wildlife Clinical Studies I	8	10	L: 2 P: 1.5	V3711AI Infectious Diseases I V3712AI Infectious Diseases II V3722CC Clinical Diagnostics V3703AD Veterinary Pharmacology V3723AG General Pathology V3701CS General Surgery V3731AP Veterinary Parasitology I V3732AP Veterinary Parasitology II	C
V3813CC	Companion Animal Clinical Studies I	8	20	L: 3 P: 1.5	(V3821CC Clinical Pathology) V3731AP Veterinary Parasitology I V3732AP Veterinary Parasitology II V3703AD Veterinary Pharmacology V3763AT Toxicology & Ethno-Vet Medicine	C

					V3711AI Infectious Diseases I V3712AI Infectious Diseases II V3701CS Veterinary General Surgery V3721CD Veterinary Diagnostic Imaging V3722CC Clinical Diagnostics	
Total Credits Semester 2						**117**
Total credits YEAR 4						**225**

Module code	**Module name**	**NQF Level**	**Credits**	**Contact hours per week (L / P / T)**	**(Co-requisites) / Pre-requisites**	**Compulsory (C) / Elective (E)**
Year 5 Semester 1						
V3883AR	Research Project	8	20	L: 2	(V3821AR Research Methodology) V3843AE Veterinary Epidemiology	C
V3821AR	Research Methodology	8	10	L: 1 T: 2	(V3843AE Veterinary Epidemiology)	C
V3833CC	Companion Animal Clinical Studies II	8	20	L: 4 P: 3	V3813CC Companion Animal Clinical Studies I	C
V3843PR	Theriogenology II	8	10	L: 2 P: 1.5	V3823PR Theriogenology I	C
V3851PA	Production Animal Clinical Studies III	8	20	L: 4 P: 3	(V3823PH Herd Health Management & Economics)	C

					V3831PA Production Animal Clinical Studies I V3832PA Production Animal Clinical Studies II	
V3801PC	Wildlife Clinical Studies II	8	10	L: 2 P: 1.5	V3830PW Wildlife Clinical Studies I	C
V3823CH	Equine Clinical Studies	8	10	L: 2 P: 1.5	V3731AP Veterinary Parasitology I V3732AP Veterinary Parasitology II V3703AD Veterinary Pharmacology V3763AT Toxicology & Ethno-Vet Medicine V3701CS Veterinary General Surgery V3721CD Veterinary Diagnostic Imaging V3722CC Clinical Diagnostics V3803AS Systemic Pathology	C
V3823PH	Herd Health Management & Economics	8	10	L: 2 P: 1.5	(V3851PA Production Animal Clinical Studies III) (V3872PA Production Animal Clinical Studies IV) (V3843PR Theriogenology II) V3831PA Production Animal Clinical Studies I V3832PA Production Animal Clinical Studies II	C

					V3823PR Theriogenology I V3843AE Veterinary Epidemiology	
Total Credits Semester 1						**110**
Year 5 Semester 2						
V3883AR	Research Project	8	20	L: 2	(V3821AR Research Methodology) V3843AE Veterinary Epidemiology	C
V3842EV	Veterinary professional skills V	8	9	L: 1.5	None	C
V3843PR	Theriogenology II	8	10	L: 2 P: 1.5	V3823PR Theriogenology I	C
V3872PA	Production Animal Clinical Studies IV	8	20	L: 4 P: 3	(V3851PA Production Animal Clinical Studies III) (V3823PH Herd Health Management & Economics) V3831PA Production Animal Clinical Studies I V3832PA Production Animal Clinical Studies II	C
V3823CH	Equine Clinical Studies	8	10	L: 2 P: 1.5	V3731AP Veterinary Parasitology I V3732AP Veterinary Parasitology II	C

					V3703AD Veterinary Pharmacology V3763AT Toxicology & Ethno-Vet Medicine V3701CS Veterinary General Surgery V3721CD Veterinary Diagnostic Imaging V3722CC Clinical Diagnostics	
V3833CC	Companion Animal Clinical Studies II	8	20	L: 4 P: 3	V3813CC Companion Animal Clinical Studies I	C
V3823PH	Herd Health Management & Economics	8	10	L: 2 P: 1.5	(V3851PA Production Animal Clinical Studies III) (V3872PA Production Animal Clinical Studies IV) (V3843PR Theriogenology II) V3831PA Production Animal Clinical Studies I V3832PA Production Animal Clinical Studies II V3823PR Theriogenology I V3843AE Veterinary Epidemiology	C
V3842AJ	Veterinary Legislation	8	9	L: 2	(V3833CC Companion Animal Clinical Studies II) (V3801PC Wildlife Clinical Studies II) (V3851PA Production Animal Clinical Studies III)	C

					(V3872PA Production Animal Clinical Studies IV) (V3843PR Theriogenology II)	
F3882FO	Integrated OSCE Examination	8	0		(V3833CC Companion Animal Clinical Studies II) (V3851PA Production Animal Clinical Studies III) (V3872PA Production Animal Clinical Studies IV) (V3843PR Theriogenology II) (V3801PC Wildlife Clinical Studies II) (V3823CH Equine Clinical Studies) V3813CC Companion Animal Clinical Studies I V3831PA Production Animal Clinical Studies I V3832PA Production Animal Clinical Studies II V3823PR Theriogenology I V3821CC Clinical Pathology V3722CC Clinical Diagnostics V3863PC Wildlife Clinical Studies I V3701CS Veterinary General Surgery	C
Total Credits Semester 2						**108**
Total credits YEAR 5						**218**

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	231	P/T: 35 hours Work Integrated Learning per week for 51 weeks	BVM V including integrated OSCE examination	C
	Theriogenology (Equine, Bovine, Small stock and Canines)					C
	Herd Health					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
	Equine Medicine					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					**231**	
Total Bachelor of Veterinary Medicine credits					**1130**	

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: ACADEMIC LITERACY I	
Module Code	U2583AL
NQF Level	5
Notional Hours	80
NQF Credits	8
Prerequisite	None
Contact Hours	Core Semester: 4 hours /week; Semester 1: 2 hours/week Semester 2: 2 hours/week
Compulsory/Elective	Compulsory
Semester Offered	Core

Module Purpose

The purpose of Academic Literacy IA is to introduce students to sources of information required to contribute to academic discourse to enhance their receptive and productive language skills through exposure to different academic genres.

Overarching Learning Outcome

Apply information searching techniques with academic skills necessary to fulfil tasks and cope with academic reading, listening, speaking and writing demands at university level.

Specific Learning Outcomes

On completing the Module students should be able to:

1. Identify potential sources of information
2. Articulate the need of information and behavioral approaches.
3. Identify required skillset to solve academic tasks or work.
4. Develop concept mapping and task-based learning themes.
5. Integrate summaries, paraphrases and quotations to avoid plagiarism.
6. Apply features of academic writing and other academic conventions in own writing.
7. Apply patterns of text organization to academic writing.
8. Summarise main ideas or relevant parts of texts.
9. Apply appropriate reading comprehension strategies.
10. Illustrate the correct use of vocabulary and grammar in speaking and writing.

Module Content

The module will cover study skills, reading (including extensive reading), listening, speaking, writing, referencing, and language usage and text organisation.

Learning and teaching strategies

The course will be facilitated through, but not limited to, the following learning activities:
Blended instruction: Face-to-face and online.
Tests and assignments
Tutorials/ Academic support
Presentations

Student assessment strategies

Assessment will be based on Continuous Assessment.

Learning and teaching enhancement strategies

Students shall be exposed to library user-based services and training.

Students that might experience performance difficulty in the module will be identified and the necessary support and guidance as an intervention strategy will be provided by the teaching staff.

Statistics of the module pass and failure rate will be continuously monitored.

Student-lecturer evaluation

Lecturer-peer evaluation

Curriculum review

Moderation of assessment tools

Prescribed Learning Resources

1. Academic Literacy IA Study Guide (Material Development is in process) by Department of Language Development staff.

Recommended Learning Resources

1. Bailey, S. (2015). *Academic writing: A handbook for international students* (4th ed.). NY: Routledge.

2. Beekman, L., Dube, C., Potgieter, H. & Underhill, J. (2016). *Academic literacy* (2nd ed.). Cape Town: Juta andCompany (Pty) Ltd.

3. Gaetz, S & Phadke, S. (2018). *Academic English: Reading and writing across the disciplines* (3rd ed.).London.UK: Pearson.

4. Machet, M. (2013). Mastering Information Skills for the 21st Century. 2nd Edition, UNISA Press, South Africa.

5. Piscitelli, S. (2009). Study skills: do I really need this stuff? (2nd ed). N.J. Pearson Prentice Hall,

6. UNAM Library Subject Specific Guides https://unam-na.libguides.com/?b=g&d=a

Module Title: DIGITAL LITERACY	
Module Code	U3583DD
NQF Level	5
Notional Hours	80
Contact hours	Semester 0: 4 hours /week; Semester 1: 2 hours/week Semester 2: 2 hours/week
Additional learning requirements	None
NQF Credits	8
(Co-requisites) **Prerequisite**	None
Compulsory/Elective	Compulsory
Semester Offered	Core Semester 1
Scheduled Review Date	TBC

Module Purpose

The purpose of this module is to equip students with competencies to access, manage, understand, integrate, communicate, evaluate and create information safely and appropriately through digital technologies for learning, employment and entrepreneurship.

Overarching Learning Outcome

Apply digital literacy skills for effective learning across the curriculum and for successful attainment of their personal and professional goals.

Specific Learning Outcomes

On completing the module students should be able to:

1. Defend the choice and use of ICT-based devices, including being able to make an assessment of the basic productivity of software, web browsers and search engines,email and other digital communication services
2. Carry out digital productivity activities such as download and upload materials to the internet or cloud or institutional shared spaces, and use digital tools to fit learning
3. Discover, organise and manage and assimilate relevant digital information using appropriate search engines, indexes or tag clouds, and evaluate digital information trustworthiness and relevance
4. Access and make sense of messages in a range of digital media, and appreciate how digital messages are designed
5. Design new digital materials, make decisions and solve problems and adopt new digital tools for learning
6. Analyse the comparative value of a range of digital communication media, work in digital teams and projects,and a range of online networks.
7. Defend the choice of digital learning opportunities through a processes including choice and identification of such resources.
8. Manage and maintain digital profiles suitable for different networks that consider digital reputation

Module Content

Digital Proficiency: ICT-based devices (laptops, tablets, smartphones, desktop computers, digital instruments and equipment); a mouse, keyboard, touch screen, voice control and other forms of input; screens, audio headsets and other forms of output; digital capture devices; University digital learning systems and a range

of personal digital services such as social media, cloud storage services, sharing sites.

Digital Productivity: Basic productivity software (text editing, presentation, spreadsheets, image editing); email and other digital communication services; Internet or cloud or institutional shared spaces for Organising, managing and backing up digital files; software/apps and services suitable for learning-related tasks; digital tools fit learning and managing learning time.

Information Literacy: search engines, indexes or tag clouds; wikis, blog posts, scholarly journals, e-books and the open web; file spaces and folders, bookmarks, reference management software and tagging; copyright, and digital citizenship issues.

Data and Media Literacy: Digital data using spreadsheets and other media; data security and privacy; digital media messages – text, graphics, video, animation, audio and multimedia.

Digital Creation and Innovation: digital materials (video, audio, stories, presentations, infographics); new digital tools for learning in digital settings.

Digital Communication, Collaboration and Participation: digital communication; differences between media, norms of communicating in different spaces; false or damaging digital communications; collaborative tools and online environments; online networks.

Digital Learning and Development: digital learning opportunities; digital learning resources; digital tools/materials for organising, planning and reflecting on learning (mind-mapping, note-taking, e-portfolio/ learning journal/ blog)

Digital Identity and Wellbeing: online profiles for different networks (personal, professional, academic); digital reputation; managing personal data and privacy; digital CV or portfolio of work; digital technologies for personal development; online etiquette; wellbeing and safety online; internet addiction; cyberbullying and other damaging online behaviour.

Learning and Teaching Strategies/Activities

Lectures: presentation on concepts and other theoretical foundations of Digital Literacy.

Discussion forums: reflecting on own contexts and sharing perspectives.

Collaborative learning: group learning and activities carried as part of projects.

Inquiry: carrying out of research to explore and understand scenarios and problems.

Projects: carry out projects on digital literacy.

Presentations and demonstrations: presentation of outcomes of projects (products, processes, impact).

Portfolio writing: writing reflective learning journals related to digital literacy.

Student Assessment Strategies

Collaborative assessment tasks

Digital productivity: *cloud based collaborative digital media creation using cloud platforms*

Project: Digital communication, collaboration and participation/ Digital Wellbeing

Individual assessment tasks

2.1 Assignment: information literacy assignment

2.2 Test x 2

Practical

Digital proficiency

Data and Media literacy

No written examination

Learning and Teaching Enhancement Strategies

Student feedback: feedback from students using focused feedback instruments

Peer feedback: student feedback on peer evaluation of each other's collaboration, participation and contribution

Self-evaluation: quizzes and students' reflective journal/ portfolio on their own learning

Learning analytics: use of learning management tools on student participation and online learning activities, and analyse assessment performance

Prescribed Learning Resources

Textbooks

Schwartz, M., Bali, M., Blocksidge, K., Brown, C., Caines, A., Dermody, K., & Peters, J. (2020). *Digital* Citizenship Toolkit. Retrieved from https://pressbooks.library.ryerson.ca/digcit/ (online version); https://openlibrary-repo.ecampusontario.ca/jspui/bitstream/123456789/856/3/Digital-Citizenship-Toolkit-1598899274.pdf (PDF version) https://openlibrary-repo.ecampusontario.ca/jspui/bitstream/123456789/856/2/Digital-Citizenship-Toolkit-1598899308.epub (eBook)

Digital Resources

JISC. (2019). Jisc digital capabilities framework: The six elements defined. Retrieved from https://repository.jisc.ac.uk/7278/1/BDCP-DC-Framework-Individual-6E-110319.pdf

JISC. (2017). Digital capabilities framework. Retrieved from https://repository.jisc.ac.uk/6611/1/JFL0066F_DIGIGAP_MOD_IND_FRAME.PDF

Joint Research Centre (European Commission). (2019). The Digital Competence Framework 2.0. Retrieved from https://ec.europa.eu/jrc/en/digcomp/digital-competence-framework

Carretero, S., Vuorikari, R., & Punie, Y. (2017). The digital competence framework for citizens. Publications Office of the European Union. Retrieved from http://svwo.be/sites/default/files/DigComp%202.1.pdf

Course resources (videos and SCORM package)

Microsoft. (2021). Microsoft digital literacy courses and resources (videos and SCORM packages). Available at https://www.microsoft.com/en-us/digital-literacy

Microsoft. (2021). Microsoft digital literacy: Teaching guides. Retrieved from https://query.prod.cms.rt.microsoft.com/cms/api/am/binary/RWBupo

OER Commons. (2021). Digital Literacy (learning objects). Retrieved https://www.oercommons.org/curated-collections/347

Module Title: NATIONAL AND GLOBAL CITIZENSHIP	
Module Code	U3420CN
NQF Level	4
Notional Hours	20
Contact hours	Up to 1 contact lecture periods per week for 6 Weeks
Mode of Delivery	Blended: Face to face and Online
Additional learning requirements	Each student will be required to work on a personal project which will include a site visit
NQF Credits	2
(Co-requisites) Prerequisite	None (University Core Module)
Compulsory/Elective	Compulsory
Semester Offered	Core Semester
Scheduled Review Date	TBC

Module Purpose

The purpose of this Module is to equip UNAM students with knowledge to understand the interconnectedness of local and global issues. Students will become acquainted with perspectives on, global citizenship, globalization and civic engagement. The module will enable students to reflect on issues affecting their communities and the world by providing a platform where students can meet and learn from one another and from external sources of information. It will guide students to determine how they can contribute to bring positive changes in their communities in relation to the Sustainable Development Goals. Furthermore, it will provide knowledge and understanding of cultural diversity and intercultural communication to enable students to become thoughtful stewards in a globalized world.

Overarching Learning Outcome

Demonstrate understanding of global citizenship and initiate action towards the betterment of local, national and global conditions, as informed and responsible citizens with a civic duty in their personal and professional lives.

Specific Learning Outcomes

On completing the module students should be able to:

1. Explain the importance of national Constitution;
2. Express understanding of National and Global Citizenship;
3. Participate in community engagement activities as part of community upliftment;
4. Express understanding of globalization;
5. Apply intercultural communication skills; and
6. Interpret SDGs to initiate personal action towards contribution of their achievement.

Module Content

UNIT 1: Constitution and its Importance: What is a constitution; Functions of a constitution; What it contains; Constitution and democracy?

UNIT 2: Global Citizenship: The meaning of global citizenship; Importance of global awareness; World issuesof concern to global citizens.

UNIT 3: Civic Engagement: What do we mean by civic engagement; Dimensions of civic engagement; Indicators of civic engagement; Promoting civic engagement.

UNIT 4: Globalization: Understanding globalization; Cultural construction of neoliberal globalization; Major players; Major domains; Major Issues; Futures of Globalization

UNIT 5: Intercultural Communication: Dealing with difference; Levels of culture; Stereotypes and generalizations; Intercultural communication Processes

UNIT 6: Sustainable Development Goals and individual action: Introduction to SDGs; Contributing to achievement of SDGs through action

Learning and Teaching Strategies/Activities

Student learning in this module will be supported by provision of subject knowledge; engaging students in class discussions, and individual awareness and action portfolios. It will expose students to real life situationthrough formal lectures, guest lectures, experiential activities such as engaging local civic organizations; Students will engage in active and participatory learning in which they generate ideas and share their knowledge on a topic. Material will include journal articles, videos, PowerPoint presentations, as well as handouts for students' reflection.

Student Assessment Strategies

Continuous assessment of 100% - Assessment will be done by completing online pop-up quizzes; and developing their online portfolios of personal action as response to tasks assigned in class.

Learning and Teaching Enhancement Strategies

Strategies will include: Continuous Module Review, and Lecturer/student evaluations. Student progress will be monitored by observing class participation during live lectures, and submission of feedback material. Including online portfolios.

Recommended Learning Resources

Adler, R.P & Goggin, J. (2005). What do we mean by Civic Engagement? *A Journal of Transformative Education*. 3 (3) 236 – 253

Bennett, M.J (1998). *Intercultural Communication: A current Perspective*. In Milton J. Bennett (Ed.) BasicConcepts of Intercultural Communication: Selected Readings. Yarmouth: ME Intercultural Press

Green, M. (2012). *Global Citizenship: What are we talking about and why does it matter.* NAFSA Associationof International Education

International IDEA (2014). *What is a Constitution? Principles and Concepts*. Constitution-building Primers.Perception Change Project. *170 Daily Actions to Transform our World*. United Nations Office in Geneva Ritzer, G. (Ed.)(2007). *The Blackwell Companion to Globalization*. Blackwell Publishing: USA United Nations. *Transforming our World: the 2030 Agenda for Sustainable Development*. UNDP

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:
Paper 1: 1 x 3hr Physiology integrated theory paper (50%)
Paper 2: 1 x 3hr Anatomy theory paper (25%)
Paper 3: 1 x 2hr Anatomy practical examination (25%)

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:
Paper 1: 1 x 3hr Physiology integrated theory paper (50%)
Paper 2: 1 x 3hr Anatomy theory paper (25%)
Paper 3: 1 x 2hr Anatomy practical examination (25%)

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	V3620EF
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: ACADEMIC LITERACY II	
Module Code	U3683LA
NQF Level	6
Notional Hours	80
NQF Credits	8
Contact Hours	Semester 0: 4 hours/week Semester 2: 2 hours/week
Prerequisite	Academic Literacy I
Compulsory/Elective	Compulsory
Semester Offered	Core 2

Module Purpose

The purpose of Academic Literacy II is to enhance students' reading, research, presentation and writing skills as demanded by different university disciplines. The course also aims to develop students' critical and analytical thinking skills.

Overarching Learning Outcome

Communicate effectively in academic discourse to meet the requirements in their respective academic disciplines.

Specific Learning Outcomes

On completing the module students should be able to:

1. Apply appropriate receptive and productive skills in various academic discursive modes and situations
2. Read and interpret specific texts
3. Critique various types of academic texts for a specific purpose
4. Synthesise information from different texts into a coherent essay
5. Summarise and paraphrase texts for academic purposes
6. Edit and proofread written work using technology
7. Write for specific purposes
8. Substantiate arguments
9. Participate in academic presentations.

Module content

The module is designed for students enrolled in a bachelor's degree, which requires them to do basicresearch, read and listen to specific academic material, produce specific written texts and give academic presentations. The module thus, focuses on enhancing academic reading, academic vocabulary, writing, listening and speaking.

Learning and teaching strategies/activities

The course will be facilitated through, but not limited to, the following learning activities:Blended instruction: Face-to-face and online
Integrated and/or collaborative instruction
Tests and assignments, tutorials and presentations

Student assessment strategies

Assessment will include written tests, individual and group assignments, portfolio assessments and oralpresentations.

Learning and teaching enhancement strategies

Weekly task completion monitoringStudent-lecturer evaluation Lecturer peer-review
Moderation of assessment toolsCurriculum review

Prescribed learning resources

Academic Literacy II Study Guide (Material Development is in process) by the Department of LanguageDevelopment
Beekman, L., Dube, C., Potgieter, H., & Underhill, J. (2019). *Academic Literacy* (3rd.). Cape Town: Juta &Company.

Recommended learning resources

http://www.uefap.com/

Module Title: ENTREPRENEURIAL SKILLS	
Module Code	U3420RT
NQF Level	4
Notional Hours	20 notional hours
Contact hours	1 x 2h per week for 6 weeks
Mode of Delivery	Blended: Face to face and online
Additional learning requirements	None
NQF Credits	2
(Co-requisites) **Prerequisite**	None
Compulsory/Elective	Compulsory
Semester Offered	Core 2
Module Purpose	
To inculcate entrepreneurial skills within the student which enables them to solve real-life problems.	
Overarching Learning Outcome	
Apply entrepreneurial skills in creating wealth and uplifting the student's well-being.	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Explain the meaning of entrepreneurship 2. Explain the entrepreneurship concepts 3. Apply entrepreneurial activity and innovation to solve real-life problems 4. Outline entrepreneurship success stories in the global context 5. Develop a start-up business plan 6. Apply entrepreneurship skills for wealth creation and uplifting of their standard of living.	

Module Content

Definition and scope of entrepreneurship and entrepreneur; Entrepreneur's environment; Characteristics of entrepreneurs; Basic concepts of entrepreneurship; Forms of entrepreneurship; **The role of entrepreneurship**; The entrepreneurial process;

The entrepreneurial mindset; Decision-making skills; Creativity, innovation and entrepreneurship; Critical thinking skills; Problem solving skills; Business and personal goal-setting skills; Negotiation skills, Communication skills, Assertiveness skills, Interpersonal skills, Cognitive skills;

Transferable skills, Practical application of entrepreneurial skills; Starting a new business; Managing a business start-up; Growing an entrepreneurial venture; Marketing skills; Managing people; Record keeping; networking skills; Time management skills; Change management skills; Entrepreneurship success stories in the global context.

Learning and Teaching Strategies/Activities

The course will be facilitated through the following learning activities: face to face and online lectures, and tutorials.

Student Assessment Strategies

The module will be assessed using 100% continuous assessment.

Learning and Teaching Enhancement Strategies

Peer reviews will be done twice a semester; Student-lecturer evaluations will be conducted twice a semester;Internal and external moderation of summative assessments.

Recommended Learning Resources

Hisrich, R.D., Peters, M.P., & Shepherd, D.A. (2017). Entrepreneurship (10th edition). McGraw-Hill EducationKuratko, D.F. (2017). Entrepreneurship: Theory, process, and practice (10th edition). Cengage.

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 Practical: 2x 3hr practicals / week for 13 weeks 12hrs 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:

Paper 1: 1 x 3hr Physiology integrated theory paper (50%)

Paper 2: 1 x 3hr Anatomy theory paper (25%)

Paper 3: 1 x 2hr Anatomy practical examination (25%)

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 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 PROFESSIONAL SKILLS III	
Module Code	V3721EV
NQF Level	7
Notional Hours	80
Contact hours	Lectures: 1x 1hr lecture / week for 5 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 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: CLINICAL DIAGNOSTICS	
Module Code	V3722CC
NQF Level	7
Notional Hours	90
Contact hours	Lectures: 2x 1hr lectures / week for 16 weeks Practical: 1x 3hr practical / alternate week for 16 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	2

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 1 theory assessment per species and at least 4 marked practical assessments (clinical examination of each species in the form of OSCEs)

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: FISH AND BEE MEDICINE	
Module Code	V3721PF
NQF Level	7
Notional Hours	90
Contact hours	Lectures and Practical: Integrated 2hrs / week for 16 weeks (blocked)
Additional learning requirements	Full day field trips
NQF Credits	9
(Co-requisites) Prerequisite	Veterinary Microbiology I Veterinary Microbiology II
Compulsory/Elective	Compulsory
Semester Offered	1

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 WOAH 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, 1 assignment, 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 16 weeks Practical: 1x 3hr practical / alternate week for 16 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 16 weeks Practical: 1x 3hr practical / alternate week for 16 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 16 weeks per semester Tutorial: 1x 3hr tutorial or field trip / alternate week for 16 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.
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.
Examination: 1 x 3hr theory paper (80%) and 1 x 2hr dosage calculation paper (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

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 16 weeks per semester Practical: 1x 3hr practical / alternate week for 16 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 16 weeks Practical: 1x 3hr practical / alternate week for 16 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:
Theory: 2 class tests, 2 quizzes, 2 class assignments
Practical: 2 OSCEs, 1 group work assessment, 1 flipped classroom presentation
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.

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: TOXICOLOGY & ETHNO-VET MEDICINE	
Module Code	V3763AT
NQF Level	7
Notional Hours	180
Contact hours	Lectures: 2x 1hr lectures / week for 16 weeks per semester Practical: 4x 2hr field trips / year
Additional learning requirements	None
NQF Credits	18
(Co-requisites) Prerequisite	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 and ethno-veterinary medicine, which will be covered on a systems basis, starting with toxicology of the body systems. Students will concentrate on toxic and medicinal plants and chemicals as well as hazardous pesticides and selected poisonous animals including snakes. In addition, students will 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.

Overarching Learning Outcome

Recognise toxic and medicinal plants, chemicals and zootoxins, which commonly affect animals, including diagnosis and treatment of affected animals. 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 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
9. Identify and collect at least 20 specimens of toxic plants of importance to livestock in Namibia

10. Preserve and display collected plants using botanically accepted methods
11. Discuss the use of traditional medicine in different communities based on the locally available indigenous natural resources
12. Discuss the advantages and disadvantages of Ethnoveterinary practices as it regards to the use of indigenous disease-prevention and treatment methods
13. 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

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

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

Indigenous Knowledge Systems (IKS) as related to the use and application of herbal and traditional medicines; identification, collection and preparation of medicinal plants

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.

Learning and Teaching Strategies/Activities

Blended teaching model through lectures, assignments, practicals and field trips

Student Assessment Strategies

Continuous Assessment: Minimum 2 theory assessments per semester. Collection, identification and preservation of at least 20 plants throughout the year will be assessed for the CA mark.

Examination: 1 x 1hr practical examination to identify plants and poisons 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 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

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
4. 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
5. Constance Marie McCorkle, Evelyn Mathias, T. W. Schillhorn-Van-Veen (1996). Ethno veterinary Research & Development**,** Intermediate Technology Publications
6. 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: VETERINARY PARASITOLOGY II	
Module Code	V3732AP
NQF Level	7
Notional Hours	170
Contact hours	Lectures: 4x 1hr lectures / week for 16 weeks Practical: 1x 3hr practical / alternate week for 16 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 16 weeks Practical: 1x 3hr practical / alternate week for 16 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 16 weeks Practical: 1x 3hr practical / alternate week for 16 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	V3721CD
NQF Level	7
Notional Hours	90
Contact hours	Lectures: 2x 1hr lectures / week for 16 weeks Practical: 1x 3hr practical / alternate week for 16 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	1
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: VETERINARY PROFESSIONAL SKILLS IV	
Module Code	V3822EV
NQF Level	8
Notional Hours	90
Contact hours	Lectures: 1x 1hr lectures / week for 16 weeks
Additional learning requirements	None
NQF Credits	9
(Co-requisites) Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2
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	V3822AL
NQF Level	8
Notional Hours	90
Contact hours	Lectures and Practical: Integrated 3hrs / week for 4 weeks
Additional learning requirements	None
NQF Credits	9
(Co-requisites) Prerequisite	Veterinary Microbiology I Veterinary Microbiology II Veterinary Parasitology I Veterinary Parasitology II Toxicology & Ethno-Vet Medicine General Pathology Molecular Biology
Compulsory/Elective	Compulsory
Semester Offered	2
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	V3821CC
NQF Level	8
Notional Hours	100
Contact hours	Lectures: 2x 1hr lectures / week for 16 weeks Practical: 1x 3hr practical / alternate week for 16 weeks
Additional learning requirements	None
NQF Credits	10
(Co-requisites) Prerequisite	Clinical Diagnostics Veterinary Parasitology I Veterinary Parasitology II
Compulsory/Elective	Compulsory
Semester Offered	1
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:
Theory: 2 class tests, 2 quizzes, 2 class activities
Practical: 2 OSCEs, 1 group work assessment, 1 flipped classroom presentation
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: SYSTEMIC PATHOLOGY	
Module Code	V3803AS
NQF Level	8
Notional Hours	200
Contact hours	Lectures: 2x 1hr lectures / week for 16 weeks per semester Practical: 1x 3hr practical / alternate week for 16 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 16 weeks Practical: 1x 3hr practical / alternate week for 16 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. The One Health introduction has the purpose to demonstrate the integration of human health, animal health and environmental health for mutual benefit.

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). Discuss the basic concept of One Health and to provide a holistic multidisciplinary view of human, animal and environmental management.

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. Define the links between animal health, human health and livelihoods, and ecosystem health
3. Explain the One Health principles and the systematic approach at One Health interfaces
4. 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
5. Explain the basic principles of food safety and food safety system development (pre-requisites/HACCP principles)
6. 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

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
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 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: 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
- 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. 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. Codex Alimentarius Guidelines
4. 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 16 weeks per semester Practical: 1x 3hr practical / alternate week for 16 weeks in semester 1 1x 3hr practical / week for 16 weeks in semester 2 3-6hrs 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 Toxicology & Ethno-Vet Medicine 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 I	
Module Code	V3831PA
NQF Level	8
Notional Hours	190
Contact hours	Lectures: 3x 1hr lectures / week for 16 weeks Practical: 1x 3hr practical / alternate week for 16 weeks
Additional learning requirements	None
NQF Credits	19
(Co-requisites) Prerequisite	(Clinical Pathology) Toxicology & Ethno-Vet Medicine 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

Discuss important aspects of poultry and pig production including nutrition, housing and breeding, which have a bearing on disease prevention and control. 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. Discuss the important aspects of poultry and pig production
2. Discuss nutritional and housing strategies to ensure maximum productivity of pigs and chickens
3. Identify and describe the aetiology and pathogenesis of some of important diseases of pigs and poultry
4. Diagnose and treat some of important diseases of pigs and poultry
5. Recommend correct biosecurity measures applicable to piggeries and poultry houses
6. Integrate concepts of anatomy, physiology, disease manifestation as its applies to poultry and porcine treatment
7. Perform basic practical procedures in poultry and pigs

Module Content

Pigs: Nutrition and related disorders of 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: Avian anatomy and physiology; poultry flock health and management programmes, including vaccination programs, aspects of housing and production systems, nutrition and nutritional diseases. 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 I	
Module Code	V3823PR
NQF Level	8
Notional Hours	200
Contact hours	Lectures: 2x 1hr lectures / week for 16 weeks per semester Practical: 1x 3hr practical / alternate week for 16 weeks per semester
Additional learning requirements	None
NQF Credits	20
(Co-requisites) Prerequisite	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 appropriate knowledge of the physiology of and andrology of selected domestic animal species animals. It will include spermatogenesis, anatomy of the reproduction organs and serves as an introduction course to semen analysis. It will also aim at developing the appropriate clinical and surgical skills for selected domestic animals with regards to reproduction (both normal and assisted) and pregnancy and parturition management and diagnosis as well as management of related diseases and disorders of the female and male reproductive systems.

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. 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
4. Discuss the physiology of pregnancy, parturition and puerperium in selected domestic animals.
5. Discuss semen handling and semen freezing in selected domestic species
6. Perform ultrasound examination for pregnancy examinations
7. Discuss and compare reproductive cycles in selected domesticated animals, dogs and cats
8. Discuss normal fertilization and diagnostic approaches to infertility in selected domestic animals, dogs and cats, and apply appropriate management strategies
9. Diagnose pregnancy in different domestic animal species, dogs and cats, and recognize abnormal pregnancy and apply corrective measures
10. Determine when intervention is necessary (including use of obstetrical instruments and performing caesarean sections in the above species)
11. Induce abortion and parturition in selected domestic animal species, dogs and cats.

12. Manage dystocia and post-partum disorders of the female companion animal including caesarean section in dogs.
13. Discuss treatment and care of the neonate of selected domestic species.
14. 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.
15. Perform semen evaluation and clinical examination of the male reproductive tract in selected domestic species.
16. Perform bull and ram breeding soundness examinations including sheath scraping and various diagnostic tests for common diseases affecting reproduction
17. Perform various methods of assisted animal reproduction (including artificial insemination)

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

Semen evaluation, 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 I	
Module Code	V3863PC
NQF Level	8
Notional Hours	200
Contact hours	Lectures: 2x 1hr lectures / week for 16 weeks per semester Practical: 1x 3hr practical / alternate week for 16 weeks per semester
Additional learning requirements	One (1) full week field training/practical (40 hours)
NQF Credits	20
(Co-requisites) Prerequisite	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

This module commences with an introduction to 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.

Mindful of the One Health perspective, and concentrating at the interface between wild animals, domestic animals and man, the module continues by providing 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 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. Additionally, the student on completion of this module 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. 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
10. Diagnose some of the important viral, bacterial, protozoal and parasitic diseases of wildlife
11. Describe the epidemiology of some important (in particular Transboundary) diseases of selected wildlife and how they relate to domestic animals and man
12. Explain the potential negative impact of infection and disease on wildlife populations
13. Describe how to carry out surveillance of wildlife populations highlighting some of the limitations of currently available tests
14. Reflect on the possible positive and negative impacts of legal and illegal trade in wildlife
15. List the common practices used in wildlife monitoring and demonstrate at least one of them
16. List and interpret the Namibian legislation with respect to the wildlife veterinarian, the wildlife industry and wildlife trade both within Namibia and for export
17. Describe and demonstrate appropriate safety procedures when working with wild animals
18. Discuss the common causes of capture related injuries and deaths and appreciate the role of stress in wild animal capture
19. List the common forms of drug injecting systems, and describe and demonstrate the use of projectile darting systems
20. Compare and criticise possible physical capture methods commonly used in southern Africa for a variety of different wildlife species

21. Compare and criticise possible transport systems commonly used in southern Africa for a variety of different wildlife species
22. Plan, participate in and analyse the success of a capture operation
23. Demonstrate appropriate record keeping when capturing, transporting, treating, testing and managing wild animals
24. Describe suitable facilities for the holding and quarantine of wild animals, and describe appropriate boma managements systems
25. Discuss different hand-rearing systems for captive wildlife
26. Describe and demonstrate the application of good animal welfare principles within the wildlife arena
27. List the major forms of human wildlife conflict, describe possible mitigation measures and their limitations

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

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 – 4 (15% 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. The Capture, Care and Management of Wildlife – Mike la Grange (1st Ed-2006) ISBN 0 627 026117 Van Schaik
2. Intensive Wildlife Production in Southern Africa – J. du. P. Bothma and N. van Rooyen. 2006. Van Schaik
3. Veld Management – Principles and Practice (1st Ed -2015) Frits van Oudtshoorn. ISBN 978-1-920217-29-7 BRIZ

4. Guidelines for the Harvesting & Processing of Wild Game in Namibia 2016 – Diana L van Schalkwyk & Louwrens C Hoffman – MET/GIZ
5. 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
6. Infectious Diseases of Livestock – JR Coetzer, GR Thomson, RC Tustin (Vol 1,2,3) – Oxford University Press. (Electronic)
7. Chemical and Physical Restraint of Wild Animals – Mike Kock & Richard Burroughs (2nd Ed -2012) ISBN 978-062052162-8 IWVS Africa (1st Ed in Libabry)
8. 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 16 weeks in per semester Practical: 1x 1hr tutorial / week for 16 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 available at: in the UNAM e-library
2. 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

Module Title: VETERINARY PUBLIC HEALTH II	
Module Code	V3812AV
NQF Level	8
Notional Hours	190
Contact hours	Lectures: 3x 1hr lectures / week for 16 weeks Practical: 1x 3hr practical / alternate week for 16 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. 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

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. Discuss the concept of One Health and 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

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
8. Demonstrate knowledge of emerging and re-emerging diseases at human/animal interfaces
9. 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
10. Evaluate the implications of climate change and environmental pollution (especially waste and waste management) and discuss preventative measure/solutions

Module Content

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.

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.

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

Module Title: PRODUCTION ANIMAL CLINICAL STUDIES II	
Module Code	V3832PA
NQF Level	8
Notional Hours	200
Contact hours	Lectures: 3x 1hr lectures / week for 16 weeks Practical: 1x 3hr practical / week for 16 weeks
Additional learning requirements	None
NQF Credits	20
(Co-requisites) **Prerequisite**	(Clinical Pathology) (Production Animal Clinical Studies I) Toxicology & Ethno-Vet Medicine 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	V3821AR
NQF Level	8
Notional Hours	100
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	10
(Co-requisites) Prerequisite	Veterinary Epidemiology
Compulsory/Elective	Compulsory
Semester Offered	1
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: VETERINARY PROFESSIONAL SKILLS V	
Module Code	V3842EV
NQF Level	8
Notional Hours	90
Contact hours	Lectures: 3x 1hr lectures / alternate week for 6 weeks
Additional learning requirements	None
NQF Credits	9
(Co-requisites) Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	2

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: RESEARCH PROJECT	
Module Code	V3883AR
NQF Level	8
Notional Hours	400
Contact hours	Lectures: 2x 1hr lectures / week for 10 weeks in semester 1 2x 1hr lectures / week for 16 weeks in semester 2
Additional learning requirements	Project, field and laboratory activities
NQF Credits	40
(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 publishable 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 publishable 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 16 weeks per semester Practical: 1x 3hr practical / week for 16 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, dentistry, neurology, oncology, emergency care and trauma, ophthalmology, multi-systemic diseases, companion animal behaviour problems as well as diseases in cage birds and exotic animals.
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
16. Differentiate between normal, unacceptable and abnormal behavior
17. Distinguish between behavioural and medical causes for behaviour problems
18. Discuss the factors that may affect the prognosis and prevent the occurrence of behaviour problems
19. Identify how a deficiency in various basic animal needs may lead to the development of behaviour problems

20. Analyse and discuss the different inherited and acquired behaviour concepts
21. Evaluate and discuss appropriate treatment strategies for the following behaviour problems: aggression, nuisance behaviour, elimination problems, anxiety and phobias, compulsive behaviour and cognitive dysfunction.
22. Discuss the management and care of cage birds, small mammals and reptiles, including basic housing and nutrition.
23. Explain relevant diagnostic imaging and clinical pathology for cage birds.
24. Explain hospitalization and anaesthesia of cage birds, including the use and administration of relevant veterinary drugs.
25. Discuss the aetiology, diagnosis and treatment of the most important diseases of cage birds, small mammals and reptiles.
26. Apply selected basic handling techniques and procedures to cage birds, including clinical examination and wing trimming.

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; Behaviour; Cage birds; Small mammals and Reptiles.

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, case studies 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 assessment in each semester, and at least 6 theory assessments and 3 practical assessments 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
11. Horwitz, DF, 2018. Blackwell's Five-Minute Veterinary Consult Clinical Companion: Canine and Feline Behaviour, 2nd edn, Wiley-Blackwell.
12. Horwitz, DF & Mills, DS, 2009, BSAVA Manual of Canine and Feline Behavioural Medicine, 2nd edn, BSAVA.
13. Mayer, J, & Donnelly, TM, 2013, Clinical Veterinary Advisor: Birds and Exotic Pets, Elsevier.
14. Chitty, J, & Monks, D, 2018, BSAVA manual of avian practice: A foundation manual, BSAVA.

Module Title: THERIOGENOLOGY II	
Module Code	V3843PR
NQF Level	8
Notional Hours	200
Contact hours	Lectures: 2x 1hr lectures / week for 16 weeks per semester Practical: 1x 3hr practical / alternate week for 16 weeks per semester
Additional learning requirements	None
NQF Credits	20
(Co-requisites) Prerequisite	Theriogenology I
Compulsory/Elective	Compulsory
Semester Offered	1 and 2 (year module)

Module Purpose

The purpose of this module is to develop appropriate knowledge of the physiology of the oestrus cycle and pregnancy period of selected domestic animal species animals. 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 and compare physiology of the reproductive cycles in selected domestic animals.
2. Discuss the physiology of pregnancy, parturition and puerperium in selected domestic animals.
3. Apply breeding manipulation including oestrus and ovulation synchronization in selected farm animals
4. Discuss normal fertilization and diagnostic approaches to infertility in selected companion animals and apply appropriate management strategies
5. Determine when intervention is necessary (including use of obstetrical instruments and performing caesarean sections in the above species)
6. Relieve dystocia mechanically
7. Diagnose pregnancy in different companion animal species and recognize abnormal pregnancy and apply corrective measures
8. Induce abortion and parturition in selected domestic animal species
9. Manage dystocia and post-partum disorders of the female companion animal including foetotomy and caesarean section
10. Detect and manage infectious and non-infectious diseases and disorders of the male and female companion animal's reproductive systems emphasizing causes of abortion
11. Perform ultrasound examination for pregnancy examinations
12. Perform various methods of assisted animal reproduction (including artificial insemination)

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

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 III	
Module Code	V3851PA
NQF Level	8
Notional Hours	200
Contact hours	Lectures: 4x 1hr lectures / week for 16 weeks Practical: 1x 3hr practical / week for 16 weeks
Additional learning requirements	None
NQF Credits	20
(Co-requisites) Prerequisite	(Herd Health Management & Economics) Production Animal Clinical Studies I Production Animal Clinical Studies II
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 (80%), and a 15 minutes practical examination (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. 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 II	
Module Code	V3801PC
NQF Level	8
Notional Hours	100
Contact hours	Lectures: 2x 1hr lectures / week for 16 weeks Practical: 1x 3hr practical / alternate week for 16 weeks
Additional learning requirements	One (1) full field training/practical week (40 hours)
NQF Credits	10
(Co-requisites) Prerequisite	Wildlife Clinical Studies I
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 16 weeks per semester Practical: 1x 3hr practical / alternate week for 16 weeks per semester
Additional learning requirements	Field trips to equine establishments
NQF Credits	20
(Co-requisites) Prerequisite	Veterinary Parasitology I Veterinary Parasitology II Veterinary Pharmacology Toxicology & Ethno-Vet Medicine 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. In addition 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. Examine, diagnose and treat relevant equine disorders.

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
4. Apply the protocol to reach a diagnosis and treatment plan for the important diseases of equines
5. Explain how to anaesthetise horses safely
6. Explain the diagnostic imaging procedures and interpret findings relevant to specific conditions in equines
7. Describe selected surgical procedures of horses including castration and wound management using specimens and models
8. Discuss the administration of veterinary drugs for treatment of the relevant conditions in equine patients
9. Discuss the management and care of equine patients

Module Content

Detailed General Clinical Examination of the horse

International equine identification criteria

Insurance certification

Pre-purchase examination of horses

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
6. FEI Identification of Horses. 3rd. Edition 1997 Printed in Switzerland for the FEI.

Module Title: HERD HEALTH MANAGEMENT & ECONOMICS	
Module Code	V3823PH
NQF Level	8
Notional Hours	200
Contact hours	Lectures: 2x 1hr lectures / week for 16 weeks per semester Practical: 1x 3hr practical / alternate week for 16 weeks per semester
Additional learning requirements	Feedlot challenge and full day field trips
NQF Credits	20
(Co-requisites) **Prerequisite**	(Production Animal Clinical Studies III) (Production Animal Clinical Studies IV) (Theriogenology II) Production Animal Clinical Studies I Production Animal Clinical Studies II Theriogenology I Veterinary Epidemiology
Compulsory/Elective	Compulsory
Semester Offered	1 and 2 (year)

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, 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 dairy cattle, 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, dairy cattle, beef cattle and mall 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. 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, lick and ration balancing in relation to negative energy balance minimization
9. Recommend correct biosecurity measures to ensure optimum health of livestock
10. Discuss the importance of keeping proper herd health records
11. Apply hoof management
12. 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. Plan, implement, monitor and evaluate animal health and production programs or projects
15. Discuss the importance of animal diseases in the efficiency of animal production
16. Discuss consumer perceptions of animals and animal products and global trade,
17. Provide details of the critical steps in systems analysis and choose appropriate modelling types and techniques
18. Policy development and implementation processes

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. 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: Economic~~al~~ aspects of the dairy herd and productivity schemes; economic importance and contribution of the dairy sector in the Namibian economy. 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, field trips and participate in feedlot challenge.

Student Assessment Strategies

Continuous assessment 100%:
Theory: at least 4 class tests
Practical: 5 marked practical assignments
Feedlot challenge: group work applied practical throughout the year

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

Module Title: PRODUCTION ANIMAL CLINICAL STUDIES IV	
Module Code	V3872PA
NQF Level	8
Notional Hours	200
Contact hours	Lectures: 4x 1hr lectures / week for 16 weeks Practical: 1x 3hr practical / week for 16 weeks
Additional learning requirements	None
NQF Credits	20
(Co-requisites) **Prerequisite**	(Production Animal Clinical Studies III) (Herd Health Management & Economics) Production Animal Clinical Studies I Production Animal Clinical Studies II
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: 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	(Companion Animal Clinical Studies II) (Wildlife Clinical Studies II) (Production Animal Clinical Studies III) (Production Animal Clinical Studies IV) (Theriogenology II)
Compulsory/Elective	Compulsory
Semester Offered	2
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, as well as 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	
Discuss the formulation of policy and legislation in terms of the Namibian Constitution. Know and apply relevant Veterinary legislation in Namibia.	
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. Discuss the Constitution of the Republic of Namibia 4. Know and apply the relevant legislation as related to the practice of veterinary medicine in Namibia 5. Explain the role of jurisprudence in the practice of veterinary medicine 6. Understand and apply veterinary ethics and distinguish between unethical and unprofessional conduct	

Module Content

The formulation and implementation of public policy through legislation, regulation and operational strategy.

Focus will be on Namibian legislation and the Namibian Constitution.

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 100%: Minimum 2 theory assessments, minimum of 1 assignment, group discussions in class

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: INTEGRATED OSCE EXAMINATION	
Module Code	V3882FO
NQF Level	8
Notional Hours	N.A
Contact hours	N.A
Additional learning requirements	
NQF Credits	Non-credit bearing
(Co-requisites) Prerequisite	(Companion Animal Clinical Studies II) (Production Animal Clinical Studies III) (Production Animal Clinical Studies IV) (Theriogenology II) (Wildlife Clinical Studies II) (Equine Clinical Studies) Companion Animal Clinical Studies I Production Animal Clinical Studies I Production Animal Clinical Studies II Theriogenology I Clinical Pathology Clinical Diagnostics Wildlife Clinical Studies I Veterinary General Surgery
Compulsory/Elective	Compulsory
Semester Offered	2
Module Purpose	
The purpose of this module is to assess the students for clinical preparedness before entering the clinical rotations in BVM VI.	
Overarching Learning Outcome	
Demonstrate competence in application of various clinical skills in a selection of OSCEs and DOPs selected from the pre-/co-requisite modules listed above	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Perform various OSCEs and DOPs essential for entry into BVM VI	

Module Content

Integrated examination covering a variety of clinical skills taught in the following modules:
Clinical Diagnostics, Clinical Pathology, Companion Animal Clinical Studies I, Companion Animal Clinical Studies II, Equine Clinical Studies, Production Animal Clinical Studies I, Production Animal Clinical Studies II, Production Animal Clinical Studies III, Production Animal Clinical Studies IV, Theriogenology I, Theriogenology II, Veterinary General Surgery, Wildlife Clinical Studies I, Wildlife Clinical Studies II

Student Assessment Strategies

Examination entrance is through achieving prescribed CA marks in all pre-and co-requisite modules listed above.

The Objective Structured Clinical Examination (OSCE) consists of a circuit of multiple stations which the students rotate round in sequence, completing a variety of tasks. OSCEs are marked using a detailed checklist accompanied by global rating scores with a pass mark calculated via a borderline regression.
Results are provided to students on the same day of the examination and students will have the opportunity to practice and repeat any failed station(s) until the skill is mastered, within the next five days. To pass the examination, every station must be passed.
Failure of the OSCE examination will result in non-admittance to the BVM VI year.
Examination mark contributes 100% to the final module mark.

Prescribed Learning Resources
All resources provided in the pre- and co-requisite modules.

Module Title: CLINICAL ROTATIONS	
Module Code	V3883FY
NQF Level	8
Notional Hours	2310
Contact hours	51 weeks, all practical
Additional learning requirements	All practical training in different clinical rotations
NQF Credits	231
(Co-requisites) Prerequisite	BVM V including integrated OSCE examination
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	231	51	BVM V including integrated OSCE examination	C
	Theriogenology (Equine, Bovine, Small stock and Canines)					C
	Herd Health					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
	Equine Medicine					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 (Wildlife, Mobile Animal Clinic, Student preference)					E
	Veterinary Association of Namibia Congress					C
						231

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 one 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%). Students who achieve less than 40% for any rotation listed above will not get examination entrance and will repeat the clinical rotation year.

Examination:

A. 2 theory papers:

1. **Paraclinical Veterinary Studies** (all species, incorporating all modules relating to Veterinary Public Health (35%); pathology (35%); epidemiology (15%); Policy, Legislation and Juris Prudence (15%))
2. **Clinical Veterinary Studies** (incorporating all modules relating to companion animals including equines (50%), production animals including wildlife (50%))

B. 2 practical exams:

1. **Practical 1**: practical examination in Veterinary Public Health and Veterinary Pathology
2. **Practical 2:**
    a. Clinical cases workup (clinical reasoning) of a canine or feline, **and** an equine patient, **and** a ruminant patient
    b. Sterilisation of a dog or cat **and** pregnancy diagnosis of 4 cows

Subminimum for each paper, theory 40% and practical 40%.
A pass mark of 50% is required for each of the theory papers and practical examinations.
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, which constitutes a fail.

Candidates with a final mark of 45-49%, or 45-49% in any of the four sections with a maximum of one section, will be invited to a single opportunity supplementary oral or practical examination concentrating on the failed section. Those who fail the supplementary oral / Pregnancy diagnoses, Anaesthesiology and Surgery examination, including candidates who committed a fatal flaw, will repeat relevant rotations and / or lectures over a period of 5 months, and rewrite the failed section(s) in the midyear examination period.

Candidates who achieve a final mark below 45% or who achieve 45-49% in more than one section of the examination will repeat the clinical rotation year and rewrite all sections of the examination.

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,	8	24	8	Veterinarian with NVC Temporary Registration and admission to	E

	Theriogenology, Veterinary Public Health, Epidemiology, Jurisprudence				NVC Board examination	
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.

DIPLOMA IN ANIMAL HEALTH

Admission requirements
The minimum admission requirements into the Diploma in Animal Health programme are as follows:

A total of at least 23 points in five subjects on the UNAM Evaluation Scale obtained in five different subjects as follows or a recognised equivalentqualification:

- Mathematics and either Biology or Agriculture on Namibia Senior Secondary Certificate Advanced Subsidiary (NSSCAS) level with a minimum of E
- 3 subjects on Namibia Senior Secondary Certificate Ordinary (NSSCO) level with a D or higher in Chemistry or Physical Science and English (compulsory) plus any other subject.

Candidates may be admitted to the Diploma in Animal Health programme based on Recognition of Prior Learning (RPL), based on procedures in theUNAM RPL Policy.

In addition to the above, final admission for all candidates shall include either an interview and or pre-selection test.

Meeting the minimum admission requirements does not necessarily guarantee admission. Admission is based on the number of places available and is granted on the basis of merit after a rigorous selection process. The Faculty reserves the right to interview candidates with similar meritorious levels before admission.

Additional Selection Criteria
Only candidates who have applied for Diploma in Animal Health as first choice will be considered for selection into the programme. The applicants with the highest points on the UNAM evaluation scale per Region will be selected. A quota will be applied to marginalized and International students.

Articulation Options
This programme serves as an alternative entry point to the following related qualifications: Bachelor of Veterinary Medicine degree, BSc Animal Science andBSc Wildlife Management and Tourism Studies. Transfer of credits may not be more than 50%.

Assessment Criteria

Student evaluation will be through formative (continuous assessment) and / or summative (final examinations) assessments. Unless otherwise specified in individual module descriptors, the continuous assessment mark for a semester module contributes 40% to the final mark, while the final examination mark will contribute 60% to the final mark.

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 anda subminimum of 50% in each of the practical and/or oral examinations. For modules with theory and practical examinations, the final mark will be calculatedbased on 60% theory and 40% practical, unless otherwise specified in the module descriptor.

Quality Assurance Arrangements

Student progress shall be monitored through assignments, tests, and short quizzes. Assessment of practicals and paraclinical work shall make use of DOPS (direct observation of a procedure).
A mentorship programme will be implemented for students in this programme.
Through monitoring of student performance, at risk students will be identified for possible intervention.
Tracer studies shall be conducted to evaluate the viability and relevance of the programme and to obtain feedback from our graduates on their experience with respect to employment and further studies.

Moderation of assessment activities

Moderation of modules with examination(s) – 1st year:
All examination papers, memoranda and a selection of scripts shall be internally moderated according to UNAM rules and regulations.
Moderation of 100% continuous assessment modules – 1st year:
A selection of assessment activities shall be internally moderated as they occur.
Moderation of modules with examination(s) – 2nd & 3rd years:
All examination papers, memoranda and a selection of scripts shall be both internally and externally moderated according to UNAMrules and regulations.
Moderation of 100% continuous assessment modules – 2nd & 3rd year:
A selection of assessment activities shall be internally moderated as they occur, and a portfolio of this selection shall be externallymoderated.
Students will be accorded the opportunity to anonymously evaluate the teaching of the module.
The frequency of programme review will be every three (3) years, or earlier as may be required.
The programme will be submitted to NQA for registration on the NQF prior to implementation.
Regular audits of the programme shall be carried out by the regulating professional body (Namibian Veterinary Council).

Minimum requirements for re-admission into the School / Programme

A student will be re-admitted into the **Diploma in Animal Health programme** if she/he has passed / attained at least:

- By the end of the first year of registration
  42 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 modules and has a total minimum of 240 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

Advancement and progression rules

First Year to Second Year

To advance to the second year of the Diploma in Animal Health programme a student must have passed all first-year modules. A student who has attained 80 credits in the first year of study will be allowed to register for a maximum of 42 credits in the second year (in addition to the failed modules) provided that:

- the relevant pre-requisites have been passed and
- there are no time table clashes

Second Year to Third Year

To advance to the third year of the Diploma in Animal Health programme a student must have passed all first- and second-year modules. A student will not be allowed to carry any modules over to the third year of study as this involves paraclinical rotations.

Requirements for Qualification Award

A minimum of 443 credits and who have met all other relevant UNAM requirements.

Career Opportunities

Graduates of the programme will be able to Work as a Veterinary Health Technician
Establish or work in a Veterinary Para-professional practice
Work as a Farm manager

Implementation strategy

The new Diploma in Animal Health programme will be implemented starting with the first year intake in February 2024.

Presently there are only 3rd year students registered for the old Diploma.

Any students repeating modules from the old curriculum, will be given an opportunity to repeat the failed modules as per the old curriculum and phase-out plan until 2025. The Implementation of this curriculum will require the following facilities: Venue for Anatomy, Animal Handling and Housing Facilities and Animals for Practical Demonstrations. These infrastructure requirements shall be implemented in a staggering approach.

Curriculum Framework: Summary Table for all Modules in the Programme

Modulecode	Module name	NQF Level	Credits	Contact hours per week (L / P /T)	(Co-requisites) / Pre-requisites	Compulsory (C) / Elective(E)
Year 1 Core Semester						
	Skills Portfolio	4	NCB	L: 1	NONE	C
U3583AL	Academic Literacy I	5	8	L: 2	NONE	C
U3583DD	Digital Literacy	5	8	L/P: 2	NONE	C
U3420CN	National and Global citizenship	4	2	L/P: 3	NONE	C
V2420EQ	Veterinary Paraprofessional Skills I	4	2	L/P: 3	NONE	C
V2440EM	Fundamentals of Microbiology and Immunology	4	2	L/p: 3	NONE	C
V2460EF	Field and Laboratory Safety	4	2	L/P: 3	NONE	C
Total Core Semester credits 24						
Modulecode	**Module name**	**NQF Level**	**Credits**	**Contact hours per week (L / P /T)**	**(Co-requisites) / Pre-requisites**	**Compulsory (C) / Elective(E)**
Year 1 Semester 1						
V2411EA	Animal Anatomy I	4	14	L: 4; P: 3	(V2460EF Field and Laboratory Safety)	C
V2431EP	Animal Physiology I	4	14	L: 4; P: 3	(V2460EF Field and Laboratory Safety)	C

V2421EB	Animal Behaviour and Handling	4	7	L:2; P: 1.5	(V2460EF Field and Laboratory Safety)	C
V2401EW	Fundamentals of Animal Welfare	4	7	L:2; P: 1.5	(V2460EF Field and Laboratory Safety)	C
V2471EI	Infectious Animal Diseases I	4	14	L: 4; P: 3	(V2460EF Field and Laboratory Safety), (V2440EM Fundamentals of Microbiology and Immunology),	C
Total Credits Semester 1 56						
Modulecode	**Module name**	**NQF Level**	**Credits**	**Contact hours per week (L / P /T)**	**(Co-requisites) / Pre-requisites**	**Compulsory (C) / Elective(E)**
Year 1 Semester 2						
V2412EA	Animal Anatomy II	4	14	L: 4; P: 3	(V2460EF Field and Laboratory Safety), (V2411EA Animal Anatomy I)	C
V2432EP	Animal Physiology II	4	14	L: 4; P: 3	(V2460EF Field and Laboratory Safety), (V2431EP Animal Physiology I)	C
V2452EL	Livestock Production I	4	14	L: 4; P: 3	(V2460EF Field and Laboratory Safety)	C
V2402EP	Animal Parasitology	4	7	L:2; P: 1.5	(V2460EFField and Laboratory Safety)	C
V2442 ET	Basic Toxicology	4	7	L:2; P: 1.5	(V2460EF Field and Laboratory Safety)	C
Total Credits Semester 2 56						
Total credits YEAR 1 136						

Modulecode	Module name	NQF Level	Credits	Contact hours per week (L / P /T)	(Co-requisites) / Pre-requisites	Compulsory (C) / Elective(E)
Year 2 Core Semester						
U3683AL	Academic Literacy II	6	8	L: 2	Academic Literacy I	C
U3420RT	Entrepreneurial Skills	4	2	L: 2	None	C
U3520TH	Introduction to Critical Thinking	5	2	L: 2	None	C
V2520EH	Human First Aid	5	2	L/P: 2	None	C
V2560EB	Animal Breeds	5	4	L/T: 3	None	C
V2540EG	Principles of Genetics	5	4	L/T: 3	None	C
U3420PJ	Project management Skills	5	2	L/T:2	None	C
Total Credits Core Semester 24						

Modulecode	Module name	NQF Level	Credits	Contact hours per week (L / P /T)	(Co-requisites) / Pre-requisites	Compulsory (C) / Elective(E)
Year 2 Semester 1						
V2511EL	Livestock Production II	5	14	L: 4; P: 3	V2460EF Field and Laboratory Safety, V2452EL Livestock Production I, (V2551EN Livestock and Pet Nutrition)	C
V2531EC	Basic Pharmacology	5	14	L: 2; P: 1.5	V2460 Field and Laboratory Safety (V2442ET Basic Toxicology)	C

V2521EH	Essential of Veterinary Public Health	5	7	L: 4; P: 3	V2460EF Field and Laboratory Safety	C
V2512EI	Infectious Animal Diseases II	5	14	L: 4; P: 3	V2460EF Field and Laboratory Safety, V2440EM Fundamentals of Microbiology and Immunology, V2471EI Infectious Animal Diseases I	C
V2551EN	Livestock and Pet Nutrition	5	14	L:4; P: 3	V2460 Field and Laboratory Safety (V2511EL Livestock Production II)	C
Total Credits Semester 1 56						
Modulecode	**Module name**	**NQF Level**	**Credits**	**Contact hours per week (L / P /T)**	**(Co-requisites) / Pre-requisites**	**Compulsory (C) / Elective(E)**
Year 2 Semester 2						
V2501EV	Basic Veterinary Epidemiology	5	7	L:2; P: 1.5	V2402EP Animal Parasitology, V2471EI Infectious Animal Diseases I, V2512EI Infectious Diseases II	C
V2532EP	Animal Pathology	5	14	L: 4; P: 3	V2460EF Field and Laboratory Safety, V2471EI Infectious Animal Diseases I, ,V2411EA Animal Anatomy I, V2412EA Animal Anatomy II, (V2512EI Infectious Animal Diseases II)	C
V2552ER	Fundamentals of Animal Reproduction	5	14	L: 4; P: 3	V2460EF Field and Laboratory Safety, V2432EP Animal Physiology II,V2412EA Animal Anatomy II	C

V2572EX	Animal Health Extension	5	14	L:2; P: 3	V2420EQ Veterinary Paraprofessional Skills I	C
V2522EF	Veterinary First Aid	5	7	L:2; P: 1.5	V2420EQ Veterinary Paraprofessional Skills I, V2460EF Field and Laboratory Safety	C
Total Credits Semester 2 63						
Total credits YEAR 2 143						

Modulecode	**Module name**	**NQF Level**	**Credits**	**Contact hours per week (L / P /T)**	**(Co-requisites) / Pre-requisites**	**Compulsory (C) / Elective (E)**
Year 3 Core Semester						
V2600EA	Livestock entrepreneurship	6	8	L/T: 3/3	NONE	C
V2620EQ	Veterinary Paraprofessional Skills II	6	8	L/T: 3/3	V2420EQ Veterinary Paraprofessional Skills I	C
V2640EG	Legislation and Jurisprudence	6	8	L/P: 3/3	NONE	C
Total Credits Core Semester 24						

MODULECODE	**MODULE TITLE**	**NQF LEVEL**	**CREDITS**	**CONTACT HOURS PER WEEK (L/P/T)**	**(CO-REQUISITES) /PRE-REQUISITES**	**Compulsory(C) / Elective (E)**
Year 3. Semesters 1 & 2: PARA-PROFESSIONAL-CLINICAL ROTATIONS						
V2683ET	Paraprofessional Rotation	6	140	P/T: 35 hours work integrated learning per week for 28 weeks.	All Year 1 and Year 2 Modules.	C
Total Year 3 Credits:					**164**	
Total Diploma in Animal Health credits						**443**

Module Title: Academic Literacy I	
Module Code	U2583AL
NQF Level	5
Notional Hours	80
NQF Credits	8
Prerequisite	None
Contact Hours	Semester 0: 4 hours /week; Semester 1: 2 hours/week Semester 2: 2 hours/week
Compulsory/Elective	Compulsory
Semester Offered	Core

Module Purpose

The purpose of Academic Literacy IA is to introduce students to sources of information required to contribute to academic discourse to enhance their receptive and productive language skills through exposure to different academic genres.

Overarching Learning Outcome

Apply information searching techniques with academic skills necessary to fulfil tasks and cope with academic reading, listening, speaking and writing demands at university level.

Specific Learning Outcomes

On completing the Module students should be able to:

1. Identify potential sources of information
2. Articulate the need of information and behavioral approaches.
3. Identify required skillset to solve academic tasks or work.
4. Develop concept mapping and task-based learning themes.
5. Integrate summaries, paraphrases and quotations to avoid plagiarism.
6. Apply features of academic writing and other academic conventions in own writing.
7. Apply patterns of text organization to academic writing.
8. Summarise main ideas or relevant parts of texts.
9. Apply appropriate reading comprehension strategies.
10. Illustrate the correct use of vocabulary and grammar in speaking and writing.

Module Content

The module will cover study skills, reading (including extensive reading), listening, speaking, writing,referencing, and language usage and text organisation.

Learning and teaching strategies

The course will be facilitated through, but not limited to, the following learning activities:Blended instruction: Face-to-face and online. (is this the correct UNAM way of expressing this?)
Tests and assignments Tutorials/ Academic supportPresentations

Student assessment strategies

Assessment will be based on Continuous Assessment.

Learning and teaching enhancement strategies

Students shall be exposed to library user-based services and training.
Students that might experience performance difficulty in the module will be identified and the necessarysupport and guidance as an intervention strategy will be provided by the teaching staff.
Statistics of the module pass and failure rate will be continuously monitored.Student-lecturer evaluation
Lecturer-peer evaluationCurriculum review
Moderation of assessment tools

Prescribed Learning Resources

Academic Literacy IA Study Guide (Material Development is in process) by Department of LanguageDevelopment staff.

Recommended Learning Resources

Bailey, S. (2015). *Academic writing: A handbook for international students* (4th ed.). NY: Routledge.
Beekman, L., Dube, C., Potgieter, H. & Underhill, J. (2016). *Academic literacy* (2nd ed.). Cape Town: Juta andCompany (Pty) Ltd.
Gaetz, S & Phadke, S. (2018). *Academic English: Reading and writing across the disciplines* (3rd ed.).London.UK: Pearson.
Machet, M. (2013). Mastering Information Skills for the 21st Century. 2nd Edition, UNISA Press, South Africa.Piscitelli, S. (2009). Study skills: do I really need this stuff? (2nd ed). N.J. Pearson Prentice Hall,
UNAM Library Subject Specific Guides https://unam-na.libguides.com/?b=g&d=a

Module Title: Digital Literacy	
Module Code	U3583DD
NQF Level	5
Notional Hours	80
Contact hours	Semester 0: 4 hours /week; Semester 1: 2 hours/week Semester 2: 2 hours/week
Additional learning requirements	None
NQF Credits	8
~~**(Co-requisites)**~~ **Prerequisite**	None
Compulsory/Elective	Compulsory
Semester Offered	Core Semester 1
Scheduled Review Date	TBC

Module Purpose

The purpose of this module is to equip students with competencies to access, manage, understand, integrate, communicate, evaluate and create information safely and appropriately through digital technologies for learning, employment and entrepreneurship.

Overarching Learning Outcome

Apply digital literacy skills for effective learning across the curriculum and for successful attainmentof their personal and professional goals.

Specific Learning Outcomes

On completing the module students should be able to:

1. Defend the choice and use of ICT-based devices, including being able to make an assessment of the basic productivity of software, web browsers and search engines, email and other digital communication services
2. Carry out digital productivity activities such as download and upload materials to the internet or cloud or institutional shared spaces, and use digital tools to fit learning
3. Discover, organise and manage and assimilate relevant digital information using appropriate search engines, indexes or tag clouds, and evaluate digital information trustworthiness and relevance
4. Access and make sense of messages in a range of digital media, and appreciate how digital messages are designed
5. Design new digital materials, make decisions and solve problems and adopt new digital tools for learning
6. Analyse the comparative value of a range of digital communication media, work in digital teams and projects,and a range of online networks.
7. Defend the choice of digital learning opportunities through a processes including choice and identification of such resources.
8. Manage and maintain digital profiles suitable for different networks that consider digital reputation

Module Content

Digital Proficiency: ICT-based devices (laptops, tablets, smartphones, desktop computers, digital instrumentsand equipment); a mouse, keyboard, touch screen, voice control and other forms of input; screens, audio headsets and other forms of output; digital capture devices; University digital learning systems and a range of personal digital services such as social media, cloud storage services, sharing sites.

Digital Productivity: Basic productivity software (text editing, presentation, spreadsheets, image editing); email and other digital communication services; Internet or cloud or institutional shared spaces for Organising, managing and backing up digital files; software/apps and services suitable for learning-related tasks; digital tools fit learning and managing learning time.

Information Literacy: search engines, indexes or tag clouds; wikis, blog posts, scholarly journals, e-books andthe open web; file spaces and folders, bookmarks, reference management software and tagging; copyright, and digital citizenship issues.

Data and Media Literacy: Digital data using spreadsheets and other media; data security and privacy; digitalmedia messages – text, graphics, video, animation, audio and multimedia.

Digital Creation and Innovation: digital materials (video, audio, stories, presentations, infographics); new digital tools for learning in digital settings.

Digital Communication, Collaboration and Participation: digital communication; differences between media, norms of communicating in different spaces; false or damaging digital communications; collaborativetools and online environments; online networks.

Digital Learning and Development: digital learning opportunities; digital learning resources; digital tools/materials for organising, planning and reflecting on learning (mind-mapping, note-taking, e-portfolio/ learning journal/ blog)

Digital Identity and Wellbeing: online profiles for different networks (personal, professional, academic); digital reputation; managing personal data and privacy; digital CV or portfolio of work; digital technologies for personal development; online etiquette; wellbeing and safety online; internet addiction; cyberbullying and other damaging online behaviour.

Learning and Teaching Strategies/Activities

Lectures: presentation on concepts and other theoretical foundations of Digital Literacy.

Discussion forums: reflecting on own contexts and sharing perspectives.

Collaborative learning: group learning and activities carried as part of projects.

Inquiry: carrying out of research to explore and understand scenarios and problems.

Projects: carry out projects on digital literacy.

Presentations and demonstrations: presentation of outcomes of projects (products, processes, impact).

Portfolio writing: writing reflective learning journals related to digital literacy.

Student Assessment Strategies

Collaborative assessment tasks

Digital productivity: *cloud based collaborative digital media creation using cloud platforms*

Project: Digital communication, collaboration and participation/ Digital Wellbeing

Individual assessment tasks

Assignment: information literacy assignment

Test x 2

Practical

Digital proficiency

Data and Media literacy

No written examination

Learning and Teaching Enhancement Strategies
Student feedback: feedback from students using focused feedback instruments
Peer feedback: student feedback on peer evaluation of each other's collaboration, participation andcontribution
Self-evaluation: quizzes and students' reflective journal/ portfolio on their own learning
Learning analytics: use of learning management tools on student participation and online learning activities,and analyse assessment performance

Prescribed Learning ResourcesTextbooks
Schwartz, M., Bali, M., Blocksidge, K., Brown, C., Caines, A., Dermody, K., & Peters, J. (2020). *Digital* Citizenship Toolkit. Retrieved from https://pressbooks.library.ryerson.ca/digcit/ (online version); https://openlibrary-repo.ecampusontario.ca/jspui/bitstream/123456789/856/3/Digital-Citizenship-Toolkit- 1598899274.pdf (PDF version) https://openlibrary- repo.ecampusontario.ca/jspui/bitstream/123456789/856/2/Digital-Citizenship-Toolkit-1598899308.epub (eBook)

Digital Resources
JISC. (2019). Jisc digital capabilities framework: The six elements defined. Retrieved from https://repository.jisc.ac.uk/7278/1/BDCP-DC-Framework-Individual-6E-110319.pdf
JISC. (2017). Digital capabilities framework. Retrieved from https://repository.jisc.ac.uk/6611/1/JFL0066F_DIGIGAP_MOD_IND_FRAME.PDF
Joint Research Centre (European Commission). (2019). The Digital Competence Framework 2.0. Retrieved from https://ec.europa.eu/jrc/en/digcomp/digital-competence-framework
Carretero, S., Vuorikari, R., & Punie, Y. (2017). The digital competence framework for citizens. Publications Office of the European Union. Retrieved from http://svwo.be/sites/default/files/DigComp%202.1.pdf

Course resources (videos and SCORM package)
Microsoft. (2021). Microsoft digital literacy courses and resources (videos and SCORM packages). Available at https://www.microsoft.com/en-us/digital-literacy
Microsoft. (2021). Microsoft digital literacy: Teaching guides. Retrieved from https://query.prod.cms.rt.microsoft.com/cms/api/am/binary/RWBupo
OER Commons. (2021). Digital Literacy (learning objects). Retrieved https://www.oercommons.org/curated-collections/347

Module Title: National and Global Citizenship	
Module Code	U3420CN
NQF Level	4
Notional Hours	20
Contact hours	Up to 1 contact lecture periods per week for 6 Weeks
Mode of Delivery	Blended: Face to face and Online
Additional learning requirements	Each student will be required to work on a personal project which will include a site visit
NQF Credits	2
(Co-requisites) **Prerequisite**	None (University Core Module)
Compulsory/Elective	Compulsory
Semester Offered	Core Semester
Scheduled Review Date	TBC

Module Purpose

The purpose of this Module is to equip UNAM students with knowledge to understand the interconnectedness of local and global issues. Students will become acquainted with perspectives on, global citizenship, globalization and civic engagement. The module will enable students to reflect on issues affecting their communities and the world by providing a platform where studentscan meet and learn from one another and from external sources of information. It will guide students to determine how they can contribute to bring positive changes in their communities in relation to the Sustainable Development Goals. Furthermore, it will provide knowledge and understanding of cultural diversity and intercultural communication to enable students to becomethoughtful stewards in a globalized world.

Overarching Learning Outcome

Demonstrate understanding of global citizenship and initiate action towards the betterment of local, national and global conditions, as informed and responsible citizens with a civic duty in their personal and professional lives.

Specific Learning Outcomes

On completing the module students should be able to:

1. Explain the importance of national Constitution;
2. Express understanding of National and Global Citizenship;
3. Participate in community engagement activities as part of community upliftment;
4. Express understanding of globalization;
5. Apply intercultural communication skills; and
6. Interpret SDGs to initiate personal action towards contribution of their achievement.

Module Content

UNIT 1: Constitution and its Importance: What is a constitution; Functions of a constitution; What it contains; Constitution and democracy?

UNIT 2: Global Citizenship: The meaning of global citizenship; Importance of global awareness; World issuesof concern to global citizens.

UNIT 3: Civic Engagement: What do we mean by civic engagement; Dimensions of civic engagement; Indicators of civic engagement; Promoting civic engagement.

UNIT 4: Globalization: Understanding globalization; Cultural construction of neoliberal globalization; Major players; Major domains; Major Issues; Futures of Globalization

UNIT 5: Intercultural Communication: Dealing with difference; Levels of culture; Stereotypes and generalizations; Intercultural communication Processes

UNIT 6: Sustainable Development Goals and individual action: Introduction to SDGs; Contributing to achievement of SDGs through action

Learning and Teaching Strategies/Activities

Student learning in this module will be supported by provision of subject knowledge; engaging students in class discussions, and individual awareness and action portfolios. It will expose students to real life situationthrough formal lectures, guest lectures, experiential activities such as engaging local civic organizations; Students will engage in active and participatory learning in which they generate ideas and share their knowledge on a topic. Material will include journal articles, videos, PowerPoint presentations, as well as handouts for students' reflection.

Student Assessment Strategies

Continuous assessment of 100% - Assessment will be done by completing online pop-up quizzes; and developing their online portfolios of personal action as response to tasks assigned in class.

Learning and Teaching Enhancement Strategies

Strategies will include: Continuous Module Review, and Lecturer/student evaluations.

Student progress will be monitored by observing class participation during live lectures, and submission offeedback material. Including online portfolios.

Recommended Learning Resources

Adler, R.P & Goggin, J. (2005). What do we mean by Civic Engagement? *A Journal of TransformativeEducation*. 3 (3) 236 – 253

Bennett, M.J (1998). *Intercultural Communication: A current Perspective*. In Milton J. Bennett (Ed.) BasicConcepts of Intercultural Communication: Selected Readings. Yarmouth: ME Intercultural Press

Green, M. (2012). *Global Citizenship: What are we talking about and why does it matter.* NAFSA Associationof International Education

International IDEA (2014). *What is a Constitution? Principles and Concepts*. Constitution-building Primers.Perception Change Project. *170 Daily Actions to Transform our World*. United Nations Office in Geneva Ritzer, G. (Ed.)(2007). *The Blackwell Companion to Globalization*. Blackwell Publishing: USA

United Nations. *Transforming our World: the 2030 Agenda for Sustainable Development*. UNDP

Module Title: Veterinary Para-professional skills **I**	
Module Code	V2420EQ
NQF Level	4
Notional Hours	20
Contact hours	3 hours blended lectures and practical per week for 6 weeks (18 hours)
Additional learning requirements	None
NQF Credits	2
(Co-requisites) Prerequisite	None.
Compulsory/Elective	Compulsory
Semester Offered	Core 1
Module Purpose	
The purpose of this module is to provide students with soft skills to be able to communicate effectively with clients,colleagues and be able to examine an animal	
Overarching Learning Outcome	
Demonstrate communication skills and be able to clinically examine an animal.	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Communicate effectively with clients and professionals 2. Use ethical principles in perspective of personal life, studies and workplace 3. Take a patient history 4. Perform a physical examination on domestic animals 5. Write a report on activities undertaken correctly	

Module Content

Client communication: Listening skills; verbal and non-verbal communication

Fundamental and applied ethics Effective conflict management strategiesPhysical examination of an animal

Report activities: writing, filling and filing forms

Learning and Teaching Strategies/Activities

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

Student Assessment Strategies

Continuous Assessment: 100 %, minimum 2 marked assignments for final CA mark (written assignment,group assignment, role-play and / or presentation).

Learning and Teaching Enhancement Strategies

Module review in consultation with experts in the subject field

Internal and external moderation of examination papers and answer scriptsStudent evaluation of the module and Lecturers at the end of the semester

Prescribed Learning Resources

http://caae.phil.cmu.edu/Cavalier/80130/part2/II_preface.html

Recommended Learning Resources:

PUN, J.K.H. **An integrated review of the role of communication in veterinary clinical practice**. BMC Vet Res16, 394 (2020). https://doi.org/10.1186/s12917-020-02558-2

Module Title: Fundamentals of Microbiology and Immunology	
Module Code	V2440EM
NQF Level	4
Notional Hours	30
Contact hours	3 hours blended lectures and practical per week for 6 weeks (18 hours)
Additional learning requirements	
NQF Credits	3
(Co-requisites) Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	Core 1

Module Purpose

The purpose of this module is to provide students with a general overview of morphology and function, growth and nutrition of bacteria, mycoplasma, virus, and fungi, different groups of pathogens that may cause diseases in farm, companion and wild animals. It also gives an overviewof veterinary immunology providing 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. Applications of both microbiology and immunology in animal health will be emphasized.

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 and the basic principles and application of veterinary immunology

Specific Learning Outcomes

On completing the module students should be able to:

1. Classify microorganisms in different taxonomic groups.
2. Describe the structure and the function of different microorganisms (bacteria,mycoplasma, prions, fungi, and viruses)
3. Discuss the pathogenicity of different groups of pathogenic microorganisms
4. Describe the innate and adaptive immune systems and the major components of each
5. Distinguish between diagnostic tests for antigens and antibodies.
6. Discuss the principles of vaccination and reasons for vaccine failure.

Module Content

General microbiology: Introduction to microbiology; morphology, growth and nutrition of bacteria,mycoplasma, virus, and fungi; and nomenclature of bacteria; microbial ecology and pathogenicity **Basic laboratory techniques:** safety rules, cleaning and sterilization, equipment, media preparation,bacteria and fungi culturing, staining and identification. Tutorials on laboratory diagnosis of viral diseases.

Immunity: concepts, types of immunity, tissues, organs and cells of the immune system, antigens and immunogenicity, antibodies, antigen and antibody interactions (serological reactions), immunologicaldisorders (immunodeficiencies, hypersensitivities, autoimmune disorders)**,** vaccines and vaccination

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

Student Assessment Strategies
Continuous Assessment: 100 %, minimum 2 marked assignments for final CA mark (written assignment,group assignment, practicals and / or presentation).

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 scriptsStudent 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
P.J. Quinn, B.K. Markey, M.E. Carter, W.J.C. Donelly, F.C. Leonard (2002). **VeterinaryMicrobiology and Microbial diseases**. Blackwell Publishing.
GR. Carter, Darla J Wise (2004**). Essentials of Veterinary Bacteriology and Mycology**, Iowa StatePress, Sixth Ed.

Module Title: Field and laboratory safety	
Module Code	V2460EF
NQF Level	4
Notional Hours	60
Contact hours	Integrated lecture and practical 1x3 hour per week for 6 weeks
Additional learning requirements	Protective clothing
NQF Credits	6
(Co-requisites) Prerequisite	None.
Compulsory/Elective	Compulsory
Semester Offered	Core 1
Module Purpose	
The purpose of this module is to introduce the student basic field and laboratory biosafetymeasures and provide practical experience in working with field and laboratory equipment (microscopy, centrifuge, incubator, spectrophotometer, water bath and autoclave.	
Overarching Learning Outcome	
Describe the use of field and laboratory equipment and apply basic biosafety measures	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Apply the field safety measures/ precautions. 2. Describe the laboratory rules and safety measures/precautions. 3. Implement the correct and safe disposal of biological specimens 4. Utilise the personal protective clothing and safety measures when conducting practicals 5. Operate and maintain commonly used field and laboratory equipment	

Module Content

Field and Laboratory biosafety and rules: basic understanding of rules to follow in a laboratory "Do's andDon'ts", protocols used in case of an emergency

Operation of basic laboratory equipment: operate and correct usage of the laboratory equipment such asthe microscopy, centrifuge, incubator, spectrophotometer, water bath and autoclave

Learning and Teaching Strategies/Activities

Lectures, tutorials, practicals, written assignments, group work, class discussions.

Student Assessment Strategies

Continuous Assessment: 100% (Minimum 3 practical assessments and 2 theory assessment).

Learning and Teaching Enhancement Strategies

Programme review in consultations with experts in the fieldExternal examiner and/or moderation
Student evaluation and supervisionRegular review of module content

Prescribed Learning Resources

Learning materials to be provided by lecturer.

Module Title: Animal Anatomy I	
Module Code	V2411EA
NQF Level	4
Notional Hours	140
Contact hours	Lectures: 4 x 1hr L/week for 12 weeks ; Practicals: 1 x 3hr P/ week for 12 weeks);
Additional learning requirements	Skills laboratory, 3D Animal models
NQF Credits	14
(Co-requisites) Prerequisite	(V2460EF Field and Laboratory Safety)
Compulsory/Elective	Compulsory
Semester Offered	1

Module Purpose

The purpose of this module is to provide students with a basic understanding of structural organisation of the animal body. It provides an overview of the gross, microscopic and basic developmental aspects of the anatomy of common livestock and companion animals. The module will focus on the following systems: musculoskeletal, digestive, cardiovascular, excretory and respiratory.

Overarching Learning Outcome

Demonstrate knowledge of the anatomy of the musculoskeletal, digestive, cardiovascular, excretory and respiratory systems of domestic animals.

Specific Learning Outcomes

On completing the module students should be able to:

1. Demonstrate the appropriate use of terminology to describe the anatomy of the important organ systems
2. Identify, name and locate clinically relevant topographic anatomical features of the musculoskeletal cardiopulmonary, digestive, skin and urinary systems of the domestic and companion animal.
3. Name and locate the major bones, joints and muscles of common livestock andcompanion animals
4. Describe the differences in dentition between livestock and companion animals
5. Identify, locate and describe the course of the oesophagus in the neck of livestock
6. Identify, locate and describe the stomach and intestines of livestock and companion animals

7. locate the relative position of the heart and its assocuiated structures in a live animal and locate various points for taking pulse and venipuncture in livestockand companion animals
8. Locate and describe the structure of the kidney in common livestock and companionanimals

Module Content

Definition of anatomical terminology, regions and planes of the animal body

Musculoskeletal: Introduction to microscopic and developmental anatomy of muscle and bone; osteology, arthrology, myology,

Digestive system: Introduction to microscopic and developmental anatomy of the alimentary tract and associated organs (liver and pancreas); gross, topographical and comparative anatomy of the mouth; oral vestibule; oral cavity proper; teeth (general structure and ageing); tongue; pharynx (general and comparativeanatomy); salivary glands; muscles of mastication; deglutition esophagus; stomach (ruminant and non- ruminant); abdominal wall and abdominal topography. Liver; pancreas.

Cardiovascular system: Introduction to microscopic and developmental anatomy of cardiac muscle; large, medium and small arteries; veins; venules; capillaries; gross and topographical anatomy of the heart (blood supply and great vessels and lymphatics); caudal mediastinum; blood supply to the neck, head, forelimb, thoracic wall and organs; blood supply to abdominal and pelvic organs.

Excretory: Introduction to microscopic and developmental anatomy of the urinary system: kidney; ureters; urinary bladder and urethra. Gross and topographical anatomy of the kidney; ureters; urinary bladder and urethra. Anatomy of the skin and accessory structures; epidermal structures; horn; hooves; nails and skin glands.

Respiratory: Introduction to microscopic and developmental anatomy of the respiratory pathways and organs; gross and topographical anatomy of the lower and upper respiratory organs, the external nares; nasalcavities; 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

Learning and Teaching Strategies/Activities

Through integrated lectures, presentations, illustrations, dissections, microscopy practicals, live animalpracticals, class discussions, written assignments and group work.

Student Assessment Strategies

Continuous Assessment: 40% (Minimum 2x theory assessments (50%) (one in each gross anatomy andhistology) and 4 x practical assessments (50%) (two in each gross anatomy and histology))

Examination: 60% (1 x 3 hour paper: 50% and 1x 2hr practical exam: 50%)

Learning and Teaching Enhancement Strategies

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 development

Prescribed Learning Resources

Veterinary Anatomy of Domestic Mammals, by Kong H.E., Liebich H.G (2004) Schattauner GmbH Stuttgart, Germany,Textbook and colour Atlas

Recommended reading material

Introduction to veterinary anatomy and physiology textbook, Elsevier by Aspinall, V 2015

Textbook of Veterinary Anatomy, 4th edition, by Dyce K.M., Sack W.O., and Weinsing C.J.G (2010),Saunders Elsevier, St Louis Missouri

Anatomie comparée des mammiféres domestiques, Vigot. Barone, R 2009,

Veterinary Neuroanatomy and Clinical Neurology-E-Book. Elsevier Health Sciences by De Lahunta, A., Glass,E. N., & Kent, M. (2014).

Applied Veterinary Anatomy, Saunders. DelaGunta and Habel, RE 1986,

Sisson and Grossman's The Anatomy of Domestic Animals. WB Saunders Company by Diesem, C., & Getty, R.(1975).

Module Title: Animal Physiology I	
Module Code	V2431EP
NQF Level	4
Notional Hours	140
Contact hours	Lectures: 4 x 1hr L/week for 12 weeks Practicals: 1 x 3hr practical/ alternating week for 12 weeks ;
Additional learning requirements	
NQF Credits	14
(Co-requisites) Prerequisite	(V2460EF Field and Laboratory Safety)
Compulsory/Elective	Compulsory
Semester Offered	1
Module Purpose	
The purpose of this module is to provide students with a basic understanding of the functioning of the musculoskeletal, digestive, cardiovascular, excretory, and respiratory systems.	
Overarching Learning Outcome	
Demonstrate knowledge on the basic function of the musculoskeletal, digestive, cardiovascular, excretory and respiratory organs or systems of the animal body.	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Explain the concept of homeostasis, regulatory mechanisms and compensatory responses 2. Discuss the digestion and absorption of carbohydrates, protein and fats in ruminants and non-ruminants 3. Explain the functions of the cardiovascular system and the different components of blood. 4. Measure blood parameters such as PCV, pulse, mucous membranes perfusion and capillary refill time 5. Discuss the role of kidney as an excretory organ and its function in electrolyte/water balance, and mention the role of the kidneyin blood pressure and acid-base balance.. 6. Explain the basic function of the skin and associated accessory glands 7. Define the concepts of residual lung volume, tidal volume, vital capacity, maximum exchanged volume 8. Discuss the factors affecting respiration	

Module Content

The basic function of the cell; fluid mosaic model, the membrane system, transport across the plasma membrane.

Organ system integration; structure-function relationship, body fluid balance, homeostasis.

Physiology of the musculoskeletal; function of muscles**,** muscle types, muscle fatigue, myopathies

Digestive system; types of digestive systems, digestion and absorption of carbohydrates, proteins and fats; differences in digestion between ruminants and non-ruminants

Cardiovascular system; composition and functions of blood and lymphatic system, measuring of bloodparameters such as blood pressure, haematocrit, PCV, heart rate

Excretory- Renal physiology; urine formation, factors affecting urine production, micturition, urinalysis

Skin physiology: mechanical protection, permeability, sweat glands, sebaceous glands, thermoregulationand excretion.
Respiratory system; ventilation, gaseous exchange, lung volumes, measuring respiration rate, exercise,pregnancy

Learning and Teaching Strategies/Activities
Through lectures and practical.

Student Assessment Strategies
Continuous Assessment: 40% (Minimum 2x theory assessments (60%) and 3x practical/ assignments/ quiz assessments (40%))
Examination: 60% (1 x 3 hour theory paper)

Learning and Teaching Enhancement Strategies
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 development

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

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

Module Title: Animal Behaviour and Handling	
Module Code	V2421EB
NQF Level	4
Notional Hours	140
Contact hours	Lectures: 4 x 1hr L/week for 12 weeks ; Practicals: 1 x 3hr P/ week for 12 weeks ;
Additional learning requirements	
NQF Credits	14
(Co-requisites) **Prerequisite**	 (V2460EF Field and Laboratory Safety)
Compulsory/Elective	Compulsory
Semester Offered	1

Module Purpose

The purpose of this module is to give students an understanding of farm and companion animal behavior with emphasis on responses to stressors related to restraining and handling, husbandry, housing, and transport. Handling of animals in different physiological states will be learned.

Overarching Learning Outcome

Describe basic animal behavior, and how various factors affect behavioural responses in farm and companion animals. Handle and restrain farm and companion animals safely, appropriately and humanely without causing them stress.

Specific Learning Outcomes

On completing the module students should be able to:

1. Apply correct methods of physical restraint and safe handling in applicable species andwith emphasis on their physiological states.
2. Handle farm and companion animals appropriately for a specific procedure.
3. Prepare patients, equipment and materials for relevant medical procedures.
4. Identify the equipment and their correct use for animal handling and restraining
5. Explain and apply the five freedoms of animal welfare to all species of animals
6. Differentiate and describe the major types of animal behaviour

Module Content

Normal and abnormal behavior of farm and companion animals; major types of behavior, interpretation of animal behaviour.

Correct/Appropriate handling and restraining methods of healthy and unhealthy animals (psychological, physical and chemical) as well as the impact of these methods on animal behaviour and welfare**.**

Animal handling and restraining equipment: identification and correct use such as neck clamp, crushpen, loading ramp, leash, muzzle, blanket, nose holder, dog catcher, cage boxes, ropes, and halter, isolation pens,mouth gag

Learning and Teaching Strategies/Activities

Blended teaching model through lectures, class discussions, and practicals

Student Assessment Strategies

Continuous Assessment: 40% (Minimum 2x theory assessments and 5 x practical assessments)Examination: 60% (1 x 3 hour 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 moderation of examination papers and answer scripts

Student evaluation of the module and lecturers at the end of the semester periodicPeriodic upgrading of laboratory facilities following new technology developments Audits by the relevant competent authorities

Prescribed Learning Resources

Broom D.M. and Fraser A.F., CAB International, ***Domestic Animal Behaviour and Welfare***, 5nd Edition,2015

Bonnie V. Beaver; Don Höglund: ***Efficient Livestock Handling: The Practical Application of Animal Welfareand Behavioral Science*** Paperback 2015

Recommended learning resources

Alcock, J. (2005), Animal Behaviour: an Evolutionary Approach, Sinauer.

Bolhuis, J. & Giraldeau, L. A. (2006), **The behavior of Animals**, Blackwell.

Ekesbo Ingva, (2011), **Farm Animal Behaviour: Characteristics for Assessment of Health and Welfare**, CAB International.

Grandin Temple & Deesing Mark, (2008), **Humane Livestock Handling**, Versa Press

Houpt, K. A.;, (2004), **Domestic Animal Behavior for Veterinarians and Animal Scientists**, 4th edition,Blackwell.

Manning Aubrey and Dawkins Marian Stamp, (2015), **An introduction to Animal Behaviour**, 6th edition,Cambridge University Press.

Ekesbo Ingva, CAB International, **Farm Animal Behaviour: Characteristics for Assessment of Health andWelfare**, 2011.

Module Title: Fundamentals of Animal Welfare	
Module Code	V2401EW
NQF Level	4
Notional hours	70
Contact hours	Lectures: 2 x 1hr L/week for 12 weeks Practicals: 1 x 3hr practical / alternating weeks for 12 weeks
Additional learning requirements	None
NQF Credits	7
(Co-requisite) Prerequisite	(V2460 Field and Laboratory Safety)
Compulsory/Elective	Compulsory)
Semester Offered	1
Module purpose	
The purpose of this module is to train students on welfare needs of animals under different production systems and conditions as well as good welfare practices of pet animals. Current standards and legislation on animal welfare in Namibia are also discussed.	
Overarching learning outcome	
Recognize infringements on animal welfare and implement corrective and preventive measures to minimize suffering.	
Learning Outcomes/Specific Outcomes *Upon successful completion of this module, the student should be able to:* 1. Explain and apply the five freedoms of animal welfare. 2. Discuss welfare and ethical concerns in animal production, at training institutions, during handling and transportation, and at the time of slaughter in relation to OIE recommendations 3. Discuss the management of animals in disaster situations, such as in drought, veld fires and floods. 4. Recognize and report infringements on animal welfare. 5. Explain the need for euthanasia in relation to animal welfare. 6. Describe the role of veterinary paraprofessionals and animal welfare organizations in setting and keeping animal welfare standards and legislation. 7. Discuss legislation relating to animal welfare in Namibia	

Module Content

Animal welfare: the Five Freedoms and OIE animal welfare recommendations.

Welfare and ethics: in animal production, at training institutions, research, during handling andtransportation, and at the time of slaughter.

Measures of animal welfare status: physiological, behavioural, disease and production parameters.

Welfare of animals in emergency situations: drought, veld fires, floods.

Euthanasia and animal welfare.

Role of veterinary paraprofessionals and animal welfare organisations in promoting animal welfare. Animal welfare legislation and standards: OIE, FANMeat Scheme, SoVM animal welfare policy, AnimalsProtection Act (Act 71 of 1962), Animal Health Act (Act 1 of 2011).

Methods of Facilitation of Learning
Blended teaching mode through lectures, assignments and practicals.

Assessment Strategies
Continuous Assessment: 40% (Minimum 2x theory assessments and 2 x practical assessments: 60% theory,30% Practical and 10% Assignments and quizzes)
Examination: 60% (1 x 2 hour theory paper)

Quality Assurance Arrangements
The quality of this module will be assured through the following activities:
Module review in consultation with experts in the subject fieldInternal moderation of examination papers and answer scripts
Student evaluation of the module and lecturers at the end of the semester.

Prescribed learning resources
Broom D.M. and Fraser A.F., (2015). **Domestic Animal Behaviour and Welfare**, CAB International, 5th Edition.
Madzingira (2018). **Animal welfare considerations in food producing animals. In: Animal Welfare, Muhammad Abubakar and Shumaila Manzoor (eds), IntechOpen.** DOI:10.5772/intechopen.78223

Recommended learning resources
OIE (2021). **Animal welfare**. https://www.oie.int/en/what-we-do/standards/codes-and-manuals/terrestrial-code-online-access/?id=169&L=1&htmfile=titre_1.7.htm
Bonnie V. Beaver; Don Höglund (2016): **Efficient Livestock Handling: The Practical Application of Animal Welfareand Behavioral Science,** Elsevier Inc.
Ekesbo Ingva (2011), Farm **Animal Behaviour: Characteristics for Assessment of Health andWelfare,** CAB International.

Module Title: Infectious Animal Diseases I	
Module Code	V2471EI
NQF Level	4
Notional Hours	140
Contact hours	Lectures: 4 x 1hr L/week for 12 weeks Practicals: 1 x 1.5hr P/week for 12 weeks
Additional learning requirements	
NQF Credits	14
(Co-requisites) Prerequisite	(V2460EF Field and Laboratory Safety, V2440EM Fundamentals of Microbiology and Immunology)
Compulsory/Elective	Compulsory
Semester Offered	1

Module Purpose

The purpose of the module is to train students to recognise common infectious diseases caused by pathogenic bacteria and fungi of veterinary importance encountered in domestic and wild animals, with a special focus on principles and techniques of diagnosis, prevention and control.

Overarching Learning Outcome

Describe infectious diseases caused by pathogenic bacteria and fungi species 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 withregards to the aetiology, epidemiology, transmission, pathogenesis, clinical signs, diagnosis, differential diagnosis, treatment, prevention and control with a particular emphasis on zoonotic and notifiable ones.

Specific Learning Outcomes

Upon completion of this module students should be able to:

1. Recognise common livestock and companion animal diseases with emphasis on Notifiable diseases of Namibia.
2. Physically examine animals infected with bacterial and fungi diseases of veterinary importance to Namibia to avoid disease transmission
3. Manage basic treatment techniques for animals infected with bacterial diseases ofveterinary importance to Namibia (abscess lance, infected wound, medicine
4. Implement relevant biosecurity measures and control programs for animals infected with bacterial diseases of veterinary importance in Namibia.
5. Correctly perform a skin/wool scraping.
6. Implement vaccination programs for common bacterial and fungi diseases in Namibia

7. List and report notifiable bacterial and fungal diseases of veterinary importance inNamibia as outlined in Animal Health Act 1 of 2011 Regulation (as amended).
8. Perform/ assist the veterinarian with sample collection and various field-based diagnostic procedures, with emphasis on sample handling, packaging, storage and transportation.
9. Assist with the performance of an intradermal tuberculin test
10. Perform basic laboratory techniques used in microbiology such as bacteriological smear, staining, culture, isolation, and identification of a variety of types of bacteria.

Module Content

Aetiology, epidemiology, transmission, pathogenesis, clinical signs, diagnosis, differential diagnosis of common bacterial and fungal diseases of domestic and wild animals.

Laboratory diagnosis of specific bacterial and fungal diseases based on appropriate sample collection andhandling, isolation, culture, staining and identification.

Treatment, prevention, and control (biosecurity, movement control, quarantine, and vaccination) ofcommon bacterial and fungal diseases.

Learning and Teaching Strategies/Activities

Blended teaching model through lectures and laboratory activities.

Student Assessment Strategies

Continuous Assessment: 40% (Minimum 2 x theory tests assessments; 4 x practical assessments and 1 x assignment/ quiz). CA calculation: Tests 60%; Practical 30%; Assignment/ quiz 10%.
Examination: 60% (1 x 3-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.Regular reviews of module content.
Effective supervision and monitoring of assignments, tests, and examinations.Monitoring and evaluation by relevant professional regulatory bodies.
Student evaluation of the module and lecturers at the end of the semester periodicUpgrading of laboratory facilities following new technology development.

Prescribed Learning Resources:

Dua Kirti. (2012), ***Infectious Diseases of farm animals***, Oxford, Alpha Science International. Margi Sirois, (2015), ***Laboratory Procedures for Veterinary Technicians***, 6th Edition, Elsevier.

Additional Learning Resources:

Bassert M. Joanna, Beal D. Angela and Samples M. Oreta, (2018) **Clinical Textbook for VeterinaryTechnicians**, 9th Edition, Elsevier

Glenn J. Songer, Karen W. Post, (2005) ***Veterinary Microbiology*** (Bacterial and Fungal Agents of AnimalDisease, Elsevier/Saunders.

Gregg L. Voigt & Shannon L. Swist, (2012), ***Hematology Techniques & Concepts for Veterinary Technicians***,2nd Edition, Wiley-Blackwell.

Hunter Pamela, ***Vaccination for the control of animal diseases in Southern Africa***, Pamela OberemPublishers.

Markey B. K. et al, (2013***) Clinical Veterinary Microbiology***, 2nd Edition, Mosby/Elsevier

Peter Jackson and Peter Cockcroft, (2002), ***Clinical Examination of Farm Animals*****,** Blackwell Publishing.The Merck's Manual
Cappucino James & Sherman Natalie, (2014) ***Microbiology : A Laboratory Manual***, 10th Edition, PearsonEducation Limited.

Module Title: Animal Anatomy II	
Module Code	V2412EA
NQF Level	5
Notional Hours	140
Contact hours	Lectures: 4 x 1hr L/week for 12 weeks Practicals: 1 x 3hr P/ week for 12 weeks
Additional learning requirements	Skills Laboratory and 3D Animal models
NQF Credits	14
(Co-requisites) **Prerequisite**	(V2411EA Animal Anatomy I V2460EF Field and Laboratory Safety)
Compulsory/Elective	Compulsory
Semester Offered	2

Module Purpose

The purpose of this module is to provide students with a basic understanding of structural organization of the animal body. It provides an overview of the gross, microscopic and basic developmental aspects of the anatomy of livestock and companion animals. The module will focuson the following systems; reproductive, endocrine, nervous and reticulo-endothelial. In addition, basic avian and fish anatomy will be discussed.

Overarching Learning Outcome

Demonstrate knowledge on the anatomy of the reproductive, endocrine, nervous and reticulo-endothelial systems. In addition, basic understanding of the avian and fish anatomy will be required.

Specific Learning Outcomes

On completing the module students should be able to:

1. Name and locate the male and female internal and external reproductive organs oflivestock and companion animals
2. Name and locate the major endocrine glands in livestock and companion animals
3. Describe the general anatomical organization of the central and peripheral nervoussystems
4. Locate and identify the sciatic nerve and explain how to avoid it during intramuscularinjection of the hamstring muscles
5. Name and locate the major lymph nodes important in clinical examination and meatinspection of livestock and companion animals
6. Refer to the anatomy of the chicken to explain why intramuscular injections should not be given in the leg

7. Explain why it is important to extend the leg to remove the birds from the perch
8. Locate venipuncture points in birds
9. Locate the common lymph nodes used in clinical examination of common livestock and companion animals during dissection of specimens and on a live animal
10. Identify clinically relevant topographic anatomical features of the avian andfish

Module Content

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. Microscopic anatomy of the major structures of male and female reproductive system

Endocrine system: topographical anatomy of the major endocrine glands; pituitary gland, pineal gland, thyroid gland, parathryroid gland, adrenal gland, pancreatic islets and gonads. Introduction to microscopic anatomy of basic tissues such as thyroid, gonads and pancreas

Nervous system: gross and topographical anatomy of the major structures of the central and peripheral nervous systems of livestock and companion animals. 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, anatomy of the eye,external ear, and the tongue). 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. Introduction to microscopic anatomy of basic tissuessuch as epithelial tissue; connective tissue; nervous tissue

Reticulo-endothelial system: location of major lymphatic vessels and the spleen; lymph node; thymus. Introduction to microscopic anatomy of basic tissues such as spleen; lymphatic vessels; lymph nodes; thymus

Anatomy of birds and fish will be discussed with emphasis on the anatomical adaptations.

Learning and Teaching Strategies/Activities

Through integrated lectures, presentations, illustrations, dissections, microscopy practicals, live animal practicals, class discussions, written assignments and group work.

Student Assessment Strategies

Continuous Assessment: 40% (Minimum 2x theory assessments (50%) (One in each gross anatomy and histology) and 4 x practical assessments (50%) (two in each gross anatomy and histology)

Examination: 60% (1 x 3 hour paper: 50% and 1x 2hr practical exam: 50%)

Learning and Teaching Enhancement Strategies

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 development.

Prescribed Learning Resources

Veterinary Anatomy of Domestic Mammals, by Kong H.E., Liebich H.G (2004) Schattauner GmbH Stuttgart, Germany,Textbook and colour Atlas

Recommended reading material

Introduction to veterinary anatomy and physiology textbook, Elsevier by Aspinall, V 2015

Textbook of Veterinary Anatomy, 4th edition, by Dyce K.M., Sack W.O., and Weinsing C.J.G (2010),Saunders Elsevier, St Louis Missouri

Anatomie comparée des mammiféres domestiques, Vigot. Barone, R 2009,

Veterinary Neuroanatomy and Clinical Neurology-E-Book. Elsevier Health Sciences by De Lahunta, A., Glass,E. N., & Kent, M. (2014).

Applied Veterinary Anatomy, Saunders. DelaGunta and Habel, RE 1986,

Sisson and Grossman's The Anatomy of Domestic Animals. WB Saunders Company by Diesem, C., & Getty, R.(1975).

Module Title: Animal Physiology II	
Module Code	V2432EP
NQF Level	4
Notional Hours	140
Contact hours	Lectures: 4 x 1hr L/week for 12 weeks ; Practicals: 1 x 3hr practical/ alternating week for 12 weeks
Additional learning requirements	
NQF Credits	14
(Co-requisites) Prerequisite	(V2431EP Animal Physiology I, V2460EF Field and Laboratory Safety)
Compulsory/Elective	Compulsory
Semester Offered	2
Module Purpose	
The purpose of this module is to provide students with a basic understanding of the functioning of the reproductive, endocrine, nervous, and immune systems. In addition, basic avian, and fish physiology will be discussed.	
Overarching Learning Outcome	
Upon completion of this module students should be able to demonstrate knowledge on the basic function of the reproductive, endocrine, nervous, and immune systems	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Describe the reproduction physiology of the male and female animals 2. Compare and contrast the roles of the endocrine and nervous systems 3. Describe the functional organization of the nervous system, including the central andperipheral nervous systems, and the autonomic nervous system 4. Discuss the functions of the sensory organs 5. Distinguish between innate and adaptive immune responses 6. Explain the physiological basis of vaccination 7. Perform serological reactions such as the agglutination test, tuberculin skin test andprecipitation test 8. Explain specific physiological adaptations of avian, reptilian and fish species	

Module Content

Reproductive system; spermatogenesis, oogenesis, puberty, oestrus cycle, sex glands, fertilization,pregnancy and parturition

Endocrine system; synergy between nervous and endocrine system, endocrine glands, hormones and theirfunctions (pancreatic, kidney, thyroid and parathyroid), positive and negative feedback loops

Nervous system; nerve impulse, action potential, reflexes, neurotransmission, feedback mechanism, senseorgans.

I**mmune system;** innate and adaptive immunity, active and passive immunity, the role of colostrum inneonates, physiology of vaccination and animal response, recognition of self and non-self, serological tests.

Avian, reptilian and fish physiology

Learning and Teaching Strategies/Activities

Through lectures and practical.

Student Assessment Strategies

Continuous Assessment: 40% (Minimum 2x theory assessments (60%) and 3 x practical/ assignments/ quiz assessments (40%))

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

Learning and Teaching Enhancement Strategies

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 development

Prescribed Learning Resources

Reece, WO, Erickson, HH, Goff, JP & Uemura, EE 2015, **Dukes' physiology of domestic animals**, 13th edn,John Wiley & Sons.

Klein, BG 2013, **Cunningham's textbook of veterinary physiology**, 5th edn, Elsevier Saunders.

Recommended Learning resources

Akers, RM & Denbow DM 2013, **Anatomy and physiology of domestic animals**, Blackwell Publishing.

Aspinall, V 2015, **Introduction to veterinary anatomy and physiology textbook**, Elsevier

Hall, JE & Guyton A 2016, **Guyton and Hall textbook of medical physiology**; 13th edn, Elsevier

Reece, WO 2015, **Functional anatomy and physiology of domestic animals**, 4th edn, John Wiley & Sons.Frandson, RD 2003, **Anatomy and Physiology of Farm Animals**, 7th edn, Wiley-Blackwell

Module Title: Livestock Production I	
Module Code	V2452EL
NQF Level	4
Notional Hours	140
Contact hours	Lectures: 4 x 1hr L/week for 12 weeks Practicals: 1 x 3hr P / week for 12 weeks
Additional learning requirements	
NQF Credits	14
(Co-requisites) Prerequisite	(V2460EF Field and Laboratory Safety)
Compulsory/Elective	Compulsory
Semester Offered	2
Module Purpose	
The purpose of this module is to introduce students to beef, dairy and small stock production systems including the management and marketing of animals and animal products in Namibia.	
Overarching Learning Outcome	
Demonstrate and understand the production, management and marketing of animals and animal products in Namibia.	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Discuss dairy, beef and small stock production systems in Namibia. 2. Apply relevant management practices to intensive and extensive production systems 3. Apply tools such as partial budgeting and cost-benefit analysis to animal health and production 4. Describe marketing of animals and animal products and their economic importance in Namibia 5. Describe and identify facilities needed for effective farming of cattle and small stock. 6. Estimate the weight of cattle and small stock using non-lineal methods and the weigh scale. 7. Describe criteria and procedures used for determining herd and flock fertility. 8. Perform various management techniques such as animal identification, castration, dehorning, vaccination, dosing, dipping and weaning. 9. Estimate the age of cattle and small stock using dentition.	

Module Content

Fundamental principles: animal products; scope of the animal industry; intensive and extensive management programs; partial budgeting and cost-benefit analysis, marketing practices; consumer affairs; FAN Meat Scheme
Production systems (e.g feeding, management, production cycle): dairy; beef, small stock
Breeding plans: dairy cattle, beef cattle, small stock.

Learning and Teaching Strategies/Activities

Through lectures, practicals, visits to different animal farms.

Student Assessment Strategies

Continuous Assessment: 40% (Minimum 2 x theory assessments (60%) and 3 x practical/ assignments/ quiz assessments (40%))

Examination: 60% (1 x 3 hour theory paper (60%), 1x3 hour practical examination (40%))

Learning and Teaching Enhancement Strategies

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 periodic Upgrading of laboratory facilities following new technology development

Prescribed Learning Resources

Robert E. Taylor, Tom G. Field; (2014), **Scientific Farm Animals Production**: 10th Edition. Prentice Hall.

Kristin J Holtgrew- Bohling, (2019**): Large Animal Clinical Procedures for Veterinary Technicians**.; 4th Edition. Mosby.

Additional Learning Resources

Bassert J.M and Thomas J.A (2013): **McCurnin's Clinical Textbook for Veterinary Technicians**; Eighth edition. Saunders.

Module Title: Animal Parasitology	
Module Code	V2402EP
NQF Level	4
Notional Hours	70
Contact hours	Lectures: 2 x 1hr L/week for 12 weeks Practicals: 1 x 3hr practical / alternate week for 12 weeks
Additional learning requirements	
NQF Credits	7
(Co-requisites) **Prerequisite**	 V2460EF Field and Laboratory Safety
Compulsory/Elective	Compulsory
Semester Offered	2

Module Purpose

The purpose of this module is to give students a basic understanding of parasitology (both internal and external parasites) and common parasitic diseases of veterinary importance in farm and companion animals

Overarching Learning Outcome

Identify and recognize the common internal and external parasites, in relation to their veterinary, economic and public health importance and be able to design and implement proper parasite control programs.

Specific Learning Outcomes

On completing the module students should be able to:

1. Recognise signs of parasitic infestation in livestock and companion animals
2. Identify common internal and external parasites of livestock and companion animals
3. Collect and evaluate appropriate parasitological specimens using methods such as skin/wool scraping, fecal floatation, and blood smears
4. Prepare and label parasitological samples for transportation and for laboratory analysis.
5. Explain how to prevent common internal and external parasitic diseases in livestock and companion animals.
6. Prepare and apply parasite control programs
7. Explain the principles of resistance to antiparasitic remedies
8. Discuss the importance of establishing enzootic stability in a population and its relevance in controlling animal parasites and parasitic diseases

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

Helminthology: classification; characteristics of main groups; life cycle in relation to transmission, pathogenesis, epidemiology, diagnosis; general control measures of trematodes, cestodes and nematodes ofveterinary importance in the region; diagnosis, treatment and prevention of diseases caused by endoparacites.

Entomology: classification of veterinary ectoparasites (e.g ticks, fleas, lice, mites, mosquitoes and biting flies)relevant to Namibia and southern Africa; morphology of various arthropod ectoparasites; life cycle and diagnosis of selected species; vector role of different ectoparasites and/or intermediate hosts of protozoan/rickettsial diseases; control methods for ectoparasites including role and importance of biologicalcontrol methods and chemical control and its effects on the environment; enzootic stability; emergence of drug resistance and ways of mitigating resistance emergence

Protozoology and 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

Learning and Teaching Strategies/Activities

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

Student Assessment Strategies

Continuous Assessment: 40%, Minimum 2x theory tests (total contribution of 60% to CA), at least one (1) marked practical assessment (total contribution of 30% to CA) and laboratory reports (total contribution of 10% to CA). Examination: 60% (1 x 2 hour theory paper: 50% and 1x 2hr practical exam: 50%)

Learning and Teaching Enhancement Strategies

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 development.

Prescribed Learning Resources

Taylor, M. A., Coop, R. L., & Wall, R. L. (2015). **Veterinary parasitology** (4th ed.). John Wiley & Sons.Hendrix, C. M., & Robinson, E. (2016). ***Diagnostic parasitology for veterinary technicians***. Mosby.

Recommended Learning Resources:

Margi Sirois, (2015), ***Laboratory Procedures for Veterinary Technicians***, 6th Edition, Elsevier.

Bellwood, B., & Andrasik-Catton, M. (2013). ***Veterinary technician's handbook of laboratory procedures***. JohnWiley & Sons

Foreyt, W. J. (2001). **Veterinary parasitology reference Manual** (5th ed.). Wiley-Blackwell

Forse, B. (1999). ***Where there is no vet.*** Oxfam Publications.

Shapiro, L. (2009). ***Pathology & parasitology for veterinary technicians***. Cengage Learning

Module Title: Basic Toxicology	
Module Code	V2442ET
NQF Level	4
Notional Hours	70
Contact hours	Lectures: 2 x 1hr L/week for 12 weeks Practicals: 1x 3hr practicals every other week
Additional learning requirements	Collect and preserve toxic plant specimens 1 x field trip
NQF Credits	7
(Co-requisites) **Prerequisite**	V2460EF Field and Laboratory Safety
Compulsory/Elective	Compulsory
Semester Offered	2
Module Purpose	
The purpose of this module is to enable students to recognize and manage common toxicosis affecting animals	
Overarching Learning Outcome	
Identify Namibia specific toxic plants, chemicals and zootoxins that commonly affect animals, their clinical presentation and management in livestock and companion animals	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Identify major toxic plants, poisonous animals, and chemicals of importance in Namibia. 2. Describe clinical signs of diseases caused by common toxic plants, zootoxins, and chemicalsin livestock in Namibia. 3. Discuss the management of disease caused by common toxic plants, zootoxins, and chemicals in Namibia 4. Identify common household causes of toxicosis in companion animals. 5. Discuss the control of problem animals using poisons and offer alternative approaches. 6. Collect, package and dispatch appropriate samples to the laboratory for toxicological analysis.	

Module Content

Major causes of animal toxicosis in Namibia, and associated clinical signs: toxic plants (affecting the heart,liver, lungs, GIT, nervous system, kidneys, blood), animal poisons (envenomation, stings, contact poisons), minerals (arsenic, lead, mercury), chemicals (strychnine, nitrate, urea, cyanide, organophosphates, chlorinated

hydrocarbons, carbamates, cyanide, lead, mercury, pesticides, herbicides, rodenticides),mycotoxins, salt/water intoxication, cyanobacteria.
Household chemicals, foods and human drugs
First aid management of animal toxicosis: decontamination, antidotes, activated charcoal, fluid therapy.
Control of problem animals using poisons: rodenticides, avicides, predicides; alternative approaches.
Collection and packaging of samples for toxicological analysis: vomitus, blood, urine, kidneys, livers.

Learning and Teaching Strategies/Activities
Blended teaching mode through lectures, assignments, practicals and field trips.

Student Assessment Strategies
Continuous Assessment: 40% (Minimum 2x theory assessments and 2 x practical assessments: 60% theory,30% practical and 10% assignments and quizzes)
Examination: 60% (1 x 2 hour paper (60%) and 1 x 2 hour practical examination (40%))

Learning and Teaching Enhancement Strategies
Module review in consultation with experts in the subject field
Internal and external moderation of examination papers and answer scriptsStudent evaluation of the module and Lecturers at the end of the semester

Prescribed Learning Resources
C. Mannheimer, A. Marais, S. Schubert (2019). **Toxic plants of veterinary importance in Namibia**. Ministry of Agriculture, Water and Forestry, Namibia.
The diagnosis and management of snakebite in dogs – a southern African perspective. Journal of the SouthAfrican Veterinary Association (2004) 75(1): 00–00 (En.).

Recommended learning resources
Poisonous plants of South Africa (2002). Ben-Erik van Wyk, Fanie van Heerden, Bosch van Oudtshoorn, Briza, Pretoria.

Module Title: Academic Literacy II	
Module Code	U3683LA
NQF Level	6
Notional Hours	80
NQF Credits	8
Contact Hours	Semester 0: 4 hours/week Semester 2: 2 hours/week
Prerequisite	Academic Literacy I
Compulsory/Elective	Compulsory
Semester Offered	Core 2

Module Purpose

The purpose of Academic Literacy II is to enhance students' reading, research, presentation and writing skills as demanded by different university disciplines. The course also aims to develop students' critical and analytical thinking skills.

Overarching Learning Outcome

Communicate effectively in academic discourse to meet the requirements in their respective academic disciplines.

Specific Learning Outcomes

On completing the module students should be able to:

1. Apply appropriate receptive and productive skills in various academic discursive modes and situations
2. Read and interpret specific texts
3. Critique various types of academic texts for a specific purpose
4. Synthesise information from different texts into a coherent essay
5. Summarise and paraphrase texts for academic purposes
6. Edit and proofread written work using technology
7. Write for specific purposes
8. Substantiate arguments
9. Participate in academic presentations.

Module content

The module is designed for students enrolled in a bachelor's degree, which requires them to do basicresearch, read and listen to specific academic material, produce specific written texts and give academic presentations. The module thus, focuses on enhancing academic reading, academic vocabulary, writing,listening and speaking.

Learning and teaching strategies/activities

The course will be facilitated through, but not limited to, the following learning activities:Blended instruction: Face-to-face and online

Integrated and/or collaborative instruction

Tests and assignments, tutorials and presentations

Student assessment strategies

Assessment will include written tests, individual and group assignments, portfolio assessments and oralpresentations.

Learning and teaching enhancement strategies

Weekly task completion monitoringStudent-lecturer evaluation Lecturer peer-review

Moderation of assessment toolsCurriculum review

Prescribed learning resources

Academic Literacy II Study Guide (Material Development is in process) by the Department of LanguageDevelopment

Beekman, L., Dube, C., Potgieter, H., & Underhill, J. (2019). *Academic Literacy* (3rd.). Cape Town: Juta &Company.

Recommended learning resources

http://www.uefap.com/

Module Title: Entrepreneurial Skills	
Module Code	U3420RT
NQF Level	4
Notional Hours	20 notional hours
Contact hours	1 x 2h per week for 6 weeks
Mode of Delivery	Blended: Face to face and online
Additional learning requirements	None
NQF Credits	2
(Co-requisites) **Prerequisite**	None
Compulsory/Elective	Compulsory
Semester Offered	Core 2
Module Purpose	
To inculcate entrepreneurial skills within the student which enables them to solve real-life problems.	
Overarching Learning Outcome	
Apply entrepreneurial skills in creating wealth and uplifting the student's well-being.	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Explain the meaning of entrepreneurship 2. Explain the entrepreneurship concepts 3. Apply entrepreneurial activity and innovation to solve real-life problems 4. Outline entrepreneurship success stories in the global context 5. Develop a start-up business plan 6. Apply entrepreneurship skills for wealth creation and uplifting of their standard of living.	

Module Content

Definition and scope of entrepreneurship and entrepreneur; Entrepreneur's environment; Characteristics of entrepreneurs; Basic concepts of entrepreneurship; Forms of entrepreneurship;

The role of entrepreneurship; The entrepreneurial process;

The entrepreneurial mindset; Decision-making skills; Creativity, innovation and entrepreneurship; Critical thinking skills; Problem solving skills; Business and personal goal-setting skills; Negotiation skills, Communication skills, Assertiveness skills, Interpersonal skills, Cognitive skills;

Transferable skills, Practical application of entrepreneurial skills; Starting a new business; Managing a business start-up; Growing an entrepreneurial venture; Marketing skills; Managing people; Record keeping; networking skills; Time management skills; Change management skills; Entrepreneurship success stories in the global context.

Learning and Teaching Strategies/Activities
The course will be facilitated through the following learning activities: face to face and online lectures, and tutorials.

Student Assessment Strategies
The module will be assessed using 100% continuous assessment.

Learning and Teaching Enhancement Strategies
Peer reviews will be done twice a semester;
Student-lecturer evaluations will be conducted twice a semester;Internal and external moderation of summative assessments.

Recommended Learning Resources
Hisrich, R.D., Peters, M.P., & Shepherd, D.A. (2017). Entrepreneurship (10th edition). McGraw-Hill EducationKuratko, D.F. (2017). Entrepreneurship: Theory, process, and practice (10th edition). Cengage.

Module Title: Introduction to Critical Thinking	
Module Code	U3520TH
NQF Level	5
Notional Hours	20 notional hours
Contact hours	1 hour practical session per week interfaced with limited online engagement
Mode of Delivery	Blended: Face to face and online
Additional learning requirements	None
NQF Credits	2
(Co-requisites) **Prerequisite**	None
Compulsory/Elective	Compulsory
Semester Offered	Core 2

Module Purpose

Empower students to apply critical thinking skills in class, work place, society and hence become life-long critical thinkers.

Overarching Learning Outcome

Apply critical thinking skills in class, self –reflect, form well- structured arguments, demonstrate problem solving skills, produce reflective learning essays and develop life-long critical thinking practices.

Specific Learning Outcomes

On completing the module students should be able to:

1. Explain what critical thinking is and the importance of critical thinking
2. Identify the core skills associated with critical thinking
3. Distinguish the difference between deductive and inductive reasoning
4. Construct a logically sound and well-reasoned argument
5. Identify the various fallacies that can arise through the misuse of logic
6. Practice using critical thinking skills and techniques in real life situation
7. Identify personal situations where critical thinking can be used.
8. Select tools for using critical thinking skills in problem solving and decision making
9. Reflect and analyse an issue or problem comprehensively.

Module Content

Definition of critical thinking: striving for understanding; to have an inquisitive yet open-minded and flexibleapproach to exploring ideas, the ability to evaluate information and draw clear conclusions based on the evidence at hand.
Core critical thinking skills: explain, infer, analyse, evaluate, problem solving, self-reflect.
Deductive and inductive reasoning: inductive reasoning- move from the specific to the general, deductive reasoning-moving from the general to specific. **Construction of argument**: construct statements that combine reasoning with evidence to support an assertion or argument.
Problem analysis: define problem, determine the root causes of problem, develop alternative solutions to problem, implement solution, evaluate outcome.
Reflective learning: asking open questions, reflect on answers, writing reflective learning essays, thinking about other's answers, asking 'why" questions.
Understanding fallacies: what is a fallacy? Description of various fallacies, identifying a fallacy in an argument,explaining a fallacy to an opponent in an argument.

Learning and Teaching Strategies/Activities

The module will be facilitated through the following learning activities: blended instruction, online learningvideos, online games and quizzes, group activities. Learning content to be facilitated through deductive, interactive and engaging methods.

Student Assessment Strategies

100% Continuous assessment (1 reflective learning essay, 1 problem solving activity).

Learning and Teaching Enhancement Strategies

Internal moderation of assessment toolsStudent evaluation
Regular review of module content
Lecturer peer evaluation

Prescribed Reading

Module learning content to be uploaded on Moodle Learning System by Dr. Mukoroli

Recommended Readings

Chatfield, T. (2018). *Critical thinking*. Pearson: London
Dobeli, R. (2014). *The art of thinking clearly*. Johnson and Sons: New YorkWartburton, N. (2019). *Thinking from A to Z.* London Press: London Rosling, H. (2016). *Factfulness*. Pearson: London.

Module Title: Project Management Skills	
Module Code	U3420PJ
NQF Level	5
Notional Hours	20
Contact hours	2 hour lecture per week for the first two week *and* field-based practical for the remaining four weeks.
Mode of Delivery	Blended: face-to-face and online
Additional learning requirements	The field-based practical to be undertaken in the immediate environment of the student
NQF Credits	2
(Co-requisites) Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	Core r 2
Module Purpose	
The purpose of this module is to develop the basic project management skills of the students.	
Overarching Learning Outcome	
Apply project management skills in their private, academic and professional life	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Articulate the phases of project life cycle 2. Use project management approach in their private, academic and professional life 3. Formulate SMART indicators for monitoring and evaluating the progress of their projects 4. Apply teamwork skills in a project settings	

Module Content

This module consist of two components: ***The first component*** is a two week theory covering the **concepts(**project vs programme) and the **phases of project life cycle (project initiation and planning:** work breakdown, development of SMART indicators, estimation of activity duration, efforts, and costs, scheduling of activities, identification of critical path, setting of milestones, stakeholder identification andcategorization, stakeholder engagement, initial risk identification, and development of the initial project plan; **project implementation & management:** forming the project team, managing people, resources allocation, responsibilities allocation, quality assurance, leadership style and project liaison; **project monitoring and control:** progress reporting and communication, quality control, time management, budget and cost management, risk management and mitigation; **project closure and evaluation**: project evaluation, project auditing process and the closure process, and final project report). ***The second component*** is a four week **field-based practical** where students participate in a real-life project in their immediate environment. Students are strictly required to apply the project management approach duringthe field-based practical.

Learning and Teaching Strategies/Activities

The learning will be carried out through the following teaching methods: -
Lectures: these will be carried out via face to face and online mode (blended method)
Field-based practical: students will be divided in groups and assigned a project to which they must apply project life cycle approach to facilitate acquisition of practical skills in project management

Student Assessment Strategies

Student assessment will be 100% continuous assessment based on weekly project progress reports (50%)and the final project report (50%). A minimum pass mark for the module is 50%.

Learning and Teaching Enhancement Strategies

Student evaluation of module delivery
Regular reviews of course content

Recommended Learning Resources

Project Management Institute. A Guide to the Project Management Body of Knowledge (PMBOK Guide).6th ed., Project Management Institute, 2017.

Module Title: Human First Aid	
Module Code	V2520EH
NQF Level	5
Notional hours	20
Contact hours	1x 3 hours Integrated Lectures and practicals for 6 weeks
Additional learning requirements	None
NQF Credits	2
(Co-requisite) Prerequisite	None
Compulsory/Elective	Compulsory
Semester Offered	Core 2
Module purpose	
The purpose of this module is to train students on basic human first aid techniques	
Overarching learning outcome	
Perform first aid management of common human medical emergencies	
Learning Outcomes/Specific Outcomes *Upon successful completion of this module, the student should be able to:* 1. List equipment, and material that forms part of a basic first aid kit. 2. Apply principles of personal safety and safety of the environment when administering first aid. 3. Perform first aid to manage common human medical emergencies	

Module Content

Principles of First Aid Responsibilities of a First Aider Safety and scene management.

First aid management: Removing clothing and head gear, CPR, management of bleeding, wounds, stings, poisons, fractures, dislocations, soft tissue injuries including burns, heat or cold exposure, near drowning incidents, choking, foreign material in the eye, snake bite, monitoring vital signs.

Methods of Facilitation of Learning

Blended teaching mode through lectures, demonstrations, role play, group activities.

Assessment Strategies

Continuous Assessment: 100% (Minimum 1 x theory assessment (50%) and 2 x practical assessments (50%))

Quality Assurance Arrangements

The quality of this module will be assured through the following activities:Module review in consultation with experts in the subject field

Internal moderation of examination papers and answer scripts

Student evaluation of the module and lecturers at the end of the semester.

Prescribed learning resources

Piazza, G.M. (2014). **First Aid Manual: step-by-step guide for everyone**, 5th edition, American College ofEmergency Physicians. https://kuiyem.ku.edu.tr/wp-content/uploads/2016/12/American-College-of- Emergency-Physicians-ACEP-First-Aid-Manual.pdf

Anonymous (2017). **Emergency First Aid.** St. John Ambulance Australia Inc. https://www.stjohnvic.com.au/media/1932/pfa1d.pdf

Module Title: Animal Breeds	
Module Code	V2560EB
NQF Level	5
Notional Hours	60
Contact hours	Integrated lectures and practical 1x3 hour per week for 6 weeks
Additional learning requirements	None
NQF Credits	6
(Co-requisites) Pre-requisite	None
Compulsory/Elective	Compulsory
Semester Offered	Core 2
Module Purpose	
The purpose of this module is to enable students to recognise and identify the different breeds of domesticated animals.	
Overarching Learning Outcome	
Recognise breeds domestic animals and their characteristics.	
Specific Learning Outcomes	
1. Identify common breeds of various domestic animals 2. Identify behavioural traits of common breeds of domestic animals.	

Module Content

History of domestication of animals.

Common Breeds; dogs, cats, cattle, horses, pigs, goats, sheep, chicken

Normal Animal Behaviour; Small animals, ruminants, non-ruminants

Learning and Teaching Strategies/Activities

Lectures, tutorials, written assignments, group work, class discussions.

Student Assessment Strategies

Continuous Assessment 100%: (Minimum 2 x theory (60%) and 1 x assignment assessment (40%)).

Learning and Teaching Enhancement Strategies

Programme review in consultations with experts in the fieldExternal examiner and/or moderation
Student evaluation and supervisionRegular review of module content

Prescribed Learning Resources

Scientific Farm Animals Production: Robert E Taylor, Tom G. Filed; 10th Edition, 2014. Pearson. ISBN: 13:978-1-292-04226-8

Modern Livestock and Poultry Production: Frank B. Flanders and James R. Gillespie; 9th Edition, 2016. CengageLearning. ISBN: 978-1-133-28350-8

Animal Behaviour: Mechanism, development, function and evolution: Chris Barnard; First Edition, 2004.Pearson Education; ISBN: 0-13-089936-4
Mammal Species of the World: A taxonomic and Geographic Reference: Volume 1 and 2; 3rd Edition, 2005. **Domestic Animal Behaviour and Welfare**: D.M Broom and A.F. Fraser; 5th Edition, 2015. ISBN: 13-9781780645391 (hbk) or 13:9781780645636 (pbk).

Module Title: Principles of Genetics	
Module Code	V2540EG
NQF Level	5
Notional Hours	60
Contact hours	Integrated lectures and practical 1x3 hour per week for 6 weeks
Additional learning requirements	None
NQF Credits	6
(Co-requisites) Pre-requisite	None
Compulsory/Elective	Compulsory
Semester Offered	Core 2
Module Purpose	
The purpose of this module is to equip students with relevant knowledge on principles of population and quantitative genetics.	
Overarching Learning Outcome	
Apply genetic concepts to explain the occurrence of desirable and undesirable phenotypes of domestic animals.	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Describe the tools available for genetic selection in domesticated animal species in Namibia. 2. Describe inbreeding and crossbreeding effects related to production and conservation ofspecies. 3. Describe complex inheritance. 4. Select animals for breeding. 5. Design a breeding program. 6. Provide informed advice to farmers about the merits of particular genetic decisions or genetic selection programs	

Module Content

Animal domestication; reasons for breeding animals, basic Mendelian genetics, polymorphism estimates,natural and artificial selection

Principles in population genetics; allele and genotype frequency, allele frequency, basic mechanisms ofinheritance, quantitative traits, genetic variation, inheritance in populations, heritability and mass selection, crossbreeding, inbreeding, correlated response to selection, DNA markers, estimating geneticgain, maternal effects

Breeding programmes; conservation of farm animal genetic resources, challenges and opportunities,sustainable animal breeding, disease susceptibility, resistance and resilience

Learning and Teaching Strategies/Activities

Lectures, tutorials, written assignments, group work, class discussions.

Student Assessment Strategies

Continuous Assessment 100%: (Minimum 2 x theory (60%) and 1 x assignment assessment (40%)).

Learning and Teaching Enhancement Strategies

Programme review in consultations with experts in the fieldExternal examiner and/or moderation

Student evaluation and supervisionRegular review of module content

Recommended Learning Resources

Scientific Farm Animals Production: Robert E Taylor, Tom G. Filed; 10th Edition, 2014. Pearson. ISBN: 13:978-1-292-04226-8

Modern Livestock and Poultry Production: Frank B. Flanders and James R. Gillespie; 9th Edition, 2016.Cengage Learning. ISBN: 978-1-133-28350-8

Bowman J.C., 1974. **An introduction to animal breeding**. Edhard Arnold.

Falconer D.S., 1996. **Introduction to quantitative genetics**. Longman, London and NY.

Animal Behaviour: Mechanism, development, function and evolution: Chris Barnard; First Edition, 2004.Pearson Education; ISBN: 0-13-089936-4

Domestic Animal Behaviour and Welfare: D.M Broom and A.F. Fraser; 5th Edition, 2015. ISBN: 13-9781780645391 (hbk) or 13:9781780645636 (pbk)

Module Title: Livestock Production II	
Module Code	V2511EL
NQF Level	5
Notional Hours	140
Contact hours	Lectures: 4 x 1hr L/week for 12 weeks Practicals: 1 x 3hr P / week for 12 weeks
Additional learning requirements	
NQF Credits	14
(Co-requisites) Prerequisite	V2460EF Field and Laboratory Safety, V2452EL Livestock Production I, (V2551EN Livestock and Pet Nutrition)
Compulsory/Elective	Compulsory
Semester Offered	1
Module Purpose	
The purpose of this module is to introduce students to pig, poultry, rabbit and fish production systems including the management and marketing of animals and animal products.	
Overarching Learning Outcome	
Demonstrate and understand the production, management and marketing of animals and animal products in Namibia.	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Discuss pig, poultry, rabbit and fish production systems in Namibia. 2. Apply relevant management practices to intensive and extensive production systems 3. Apply tools such as partial budgeting and cost-benefit analysis to animal health and production 4. Describe marketing of animals and animal products and their economic importance in Namibia 5. Describe and identify facilities needed for effective farming of~~,~~ pigs, poultry, rabbit and fish 6. Estimate the weight of pigs using non-lineal methods and the weigh scale. 7. Perform various management techniques such as animal identification, castration, vaccination, dosing, dipping and weaning.	

Module Content

Fundamental principles: animal products; scope of the animal industry; intensive and extensive management programs; partial budgeting and cost-benefit analysis, marketing practices; consumer affairs.

Production systems (e.g feeding, management, production cycle): pig; poultry; fish; rabbit

Breeding plans:, pigs, poultry, rabbit, fish

Learning and Teaching Strategies/Activities
Through lectures, practicals, visits to different animal farms.

Student Assessment Strategies
Continuous Assessment: 40% (Minimum 2 x theory assessments (60%) and 3 x practical/ assignments/ quiz assessments (40%))
Examination: 60% (1 x 3 hour theory paper (60%), 1x3 hour practical examination (40%))

Learning and Teaching Enhancement Strategies
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 periodic Upgrading of laboratory facilities following new technology development

Prescribed Learning Resources
Robert E. Taylor, Tom G. Field; (2014), **Scientific Farm Animals Production**: 10th Edition. Prentice Hall.
Kristin J Holtgrew- Bohling, (2019): **Large Animal Clinical Procedures for Veterinary Technicians**.; 4th Edition. Mosby.

Recommended Learning Resources
Bassert J.M and Thomas J.A (2013): **McCurnin's Clinical Textbook for Veterinary Technicians**; Eighth edition. Saunders

Module Title: Basic Pharmacology	
Module Code	V2531EC
NQF Level	5
Notional hours	140
Contact hours	4 x 1hr Lectures/week for 12 weeks 1x 3hr practicals / alternating week for 12 weeks
Additional learning requirements	
NQF Credits	14
(Co-requisites)Pre-requisite	V2422ET Basic Toxicology, V2460EF Field and Laboratory Safety
Compulsory/Elective	Compulsory
Semester Offered	1
Module purpose:	
The purpose of this module is to equip students with knowledge on different classes and uses of veterinary medicines, dosage calculations, routes of administration, recognition of adverse reactions and legislation regulating the use and handling of veterinary medicines in Namibia.	
Overarching learning outcome	
Identify common veterinary medicines, their indications, and calculate dosages for administration using various routes in domestic animals.	
Learning Outcomes/Specific Outcomes *Upon completion of this module, students should be able to:* 1. Identify various classes of veterinary medicines and chemicals, their indications, contraindications and routes of administration. 2. Calculate appropriate doses of veterinary medicines and chemicals based on the live mass ofan animal. 3. Discuss the principles of pharmacokinetics and pharmacodynamics. 4. Explain the importance of observing recommended drug withdrawal periods. 5. Discuss the concept of anti-microbial resistance. 6. Discuss the cold chain for veterinary medicines during transportation and storage. 7. Discuss legislation governing the handling and use of veterinary medicines in Namibia. 8. Identify scheduled pharmaceutical products and their appropriate storage.	

Module Content

Classes of pharmaceutical products: nomenclature; antibiotics, antifungals, anaesthetics, hormones, anti-inflammatories, analgesics, antihistamines, vitamins, vaccines, antisera, ectoparasiticides, endoparasiticides (anthelmintics), disinfectants, antiseptics, and antidotes.

Drug dosage forms: solid, liquid, semisolid, aerosols.

Legislation regulating the use of veterinary medicines in Namibia: Medicines and related substances control act (Act 13 of 2003); Prevention of undesirable Residues Act (Act 21 of 1991).
Calculations in pharmacology: conversion units; drug concentrations; drug dosage rates; drug dosage calculations.
Routes of drug administration: oral and parenteral (subcutaneous, intravenous, intramuscular, intrauterine); advantages and disadvantages; selection of the route of administration.
Pharmacokinetics: drug absorption, distribution, metabolism/biotransformation and excretion, 'first passeffect'.
Pharmacodynamics: receptors; drug-receptor interactions; agonists, partial agonists, antagonists; affinity, efficacy and potency; non-receptor interactions, individual variation in responses to drugs; drug interactions.
Adverse reactions to drugs: side effects, untoward effects, allergic reactions, idiosyncratic reactions, teratogenic effects. Drug withdrawal periods.
Antimicrobial resistance
Indications for pharmaceutical products: antibiotics, antifungals, anesthetics, anti-inflammatories, analgesics, antihistamines, vitamins, vaccines, antisera, ectoparasiticides, endoparasiticides (anthelmintics), disinfectants, antiseptics, and antidotes.
The cold chain for veterinary medicines: from point of purchase to point of use; storage of vaccines to beused in the field; storage practices of medicines in refrigerators or on the shelf.
Prohibited veterinary medicines such as phenylbutazone, chloramphenicol, hormones.

Methods of Facilitation of Learning
Blended teaching model through lectures, assignments, and practicals.

Assessment Strategies
Continuous Assessment: 40% (Minimum 2x theory assessments and 2 x practical assessments: 60%theory, 30% Practical and 10% Assignments and quizzes)
Examination: 60% (1 x 3 hour paper (50%) and 1 x 2 hour practical examination (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
External moderation of examination papers and answer scripts
Student and lecturer evaluations of the module at the end of the semester

Prescribed Learning Resources

B.P. Wanamaker, KL Massey (2015). **Applied Pharmacology for Veterinary Technicians**. Fifth Edition. Saunders.
WH Hsu (2008). **Handbook of Veterinary Pharmacology**. Wiley-Blackwell. Ames, Iowa.

Recommended Learning Resources
R. Lapham and Heather Agar (2009). **Drug calculations for nurses: A step-by-step approach**. CRC Press.
MJ Day and RD Schultz (2014). **Veterinary Immunology: Principles and Practice** 2nd Edn.. CRC Press.
MIMS Index of Veterinary Specialties (IVS). http://www.mims.co.za/

Module Title: Essentials of Veterinary Public Health	
Module Code	V2521EH
NQF Level	5
Notional Hours	70
Contact hours	4 x 1hr lectures/week for 12 weeks 1 x 3hr practical/alternating week for 12 weeks
Additional learning requirements	1 x field trip
NQF Credits	7
(Co-requisites) Prerequisite	V2460EF Field and Laboratory Safety
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 paraprofessional with respect to the protection of public health, and also provides students with knowledge on the most important zoonotic, waterborne and food borne diseases.

Overarching Learning Outcome

Apply veterinary para-professional skills to the protection of the health of the public and animals under the One Health Concept at abattoirs, and during routine paraprofessional work in the field.

Specific Learning Outcomes

On completing the module, students should be able to:

1. Discuss the role of the veterinary professional in promoting public health at national, regional and international level.
2. Outline the stages of the red and white meat production chain from 'farm to fork', and identify critical stages at which risks to public health may be prevented and controlled.
3. Explain the principles of food safety and food safety management system development (pre-requisites and the HACCP principles)
4. Discuss the prevention and control of the most important zoonotic, and food borne diseases.
5. Prepare animals for ante mortem inspection by compiling and reporting information on animal identification, origin, health status, accompanying documentation, and status of facilities to the veterinarian.
6. Perform primary meat inspection on bovine, porcine, ovine, poultry and game carcasses and offal as per set procedures, and take appropriate decisions on inspectedmeat affected by various pathological conditions.
7. Discuss animal welfare during transportation and at the time of slaughter based on thefive freedoms and OIE standards.
8. Explain the one health concept.
9. Discuss legislation and international standards relating to food safety, animal health, husbandry, welfare and slaughter in Namibia.

Module Content

Introduction: abattoir registration and siting, abattoir layout (poultry and red meat abattoirs), general and specific requirements for abattoirs.

Basic hygiene at abattoirs: medical testing, personal hygiene, protective gear, personnel hygiene practices, abattoir sanitation, water quality, waste management, pest control.

Ante mortem inspection procedures: cattle, sheep, pig, and poultry,

Abattoir slaughter and dressing processes and critical areas/practices for preventing contamination: cattle, sheep, game, poultry and pig slaughter processes.

Meat inspection procedures (cattle, sheep, game, poultry, pig): correlation/synchronisation, primary andsecondary meat inspection procedures, meat detaining and condemnation procedures, common pathological conditions detected at meat inspection and decisions.

Meat storage: freezing and chilling temperatures for meat of various species, freeze treatment of mild *Cysticercus bovis* infested meat.

Waste management: condemned meat, effluent, dung/manure, blood.

Principles of food safety and food safety system development: pre-requisite programs, list the seven principles of HACCP.

Zoonotic, food and water borne diseases relevant to Namibia Laws and regulations impacting food animal processing industries:

Animal welfare, based on OIE welfare standards at slaughter, inspection of animal transport vehicles,holding facilities, emergency slaughter, humane slaughter methods for different species.

The **'One Health'** concept.

Learning and Teaching Strategies/Activities

Blended mode of teaching through lectures, laboratory practicals, and field trip to an abattoir.

Student Assessment Strategies

Continuous Assessment: 40% (Minimum 2x theory assessments and 3 x practical assessments: 60%theory, 30% Practical and 10% Assignments and quizzes)

Examination: 60% (1 x 3 hour paper: 50% and 1x 2hr practical exam: 50%)

Learning and Teaching Enhancement Strategies

Module review in consultation with experts in the subject fieldExternal moderation of examination papers and answer scripts

Student evaluation of the module and Lecturers at the end of the semester

Prescribed Learning Resources

DS Collins and RJ Huey (2015). Gracey's Meat Hygiene, 11th Edition. Wiley Blackwell.

FAO Manualon meat inspection for developing countries: https://www.fao.org/3/t0756e/t0756e00.htm

Recommended Learning Resources

S. Mortimore, C. Wallace (2013). **HACCP – a practical approach**, 3rd edition: Springer.

P. Paulsen, A. Bauer and FJM Smoulders (2014). **Trends in game meat hygiene. Forest to Fork**. Wageningen Academic Publishers.

General Principles of Food Hygiene. CAC/RCP 1 – 1969. https://www.fao.org/fao-who-codexalimentarius/sh-proxy/en/?lnk=1&url=https%253A%252F%252Fworkspace.fao.org%252Fsites%252Fcodex%252FStandards%252FCXC%2B1-1969%252FCXC_001e.pdf

Food Safety-The science of keeping food safe (2018). IC Shaw. Wiley-Blackwell.

Transport of animals by land:
https://www.woah.org/fileadmin/Home/eng/Health_standards/tahc/current/chapitre_aw_land_transpt.pdf
Meat Inspector's Manual: Abattoir Hygiene:
https://www.westerncape.gov.za/assets/departments/agriculture/abattoirhygienemanual.pdf
HACCP: http://www.fda.gov/Food/GuidanceRegulation/HACCP/ucm2006801.htm#princ
Slaughter of animals:
https://www.woah.org/fileadmin/Home/eng/Health_standards/tahc/2018/en_chapitre_aw_slaughter.htm

Module Title: Infectious Animal Diseases II	
Module Code	V2512EI
NQF Level	5
Notional Hours	140
Contact hours	Lectures: 1x 4hr L/week for 12 weeks Practicals: 1 x 3hr P/ alternating week for 12 weeks
Additional learning requirements	
NQF Credits	14
(Co-requisites) Prerequisite	V2471EI Infectious Animal Diseases I, V2460EFField and Laboratory Safety, V2440EM Fundamentals of Microbiology and Immunology
Compulsory/Elective	Compulsory
Semester Offered	2

Module Purpose

The purpose of this module is to train students to recognise common infectious diseases caused by viruses and prions of veterinary importance in domestic and wild animals, with a focus on principles and techniques of diagnosis, prevention, and control.

Overarching Learning Outcome

Describe the infectious diseases caused by viral and prion diseases species 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, epidemiology, transmission, pathogenesis, clinical signs, diagnosis, differential diagnosis, treatment, prevention and control with particular emphasis on zoonotic and notifiable ones.

Specific Learning Outcomes

1. Recognise common viral and prion diseases of livestock and companion animals with special emphasis to notifiable diseases of Namibia.
2. Collect a sample from a suspected rabid animal with correct completion ofdocumentation.
3. Collect appropriate sample for viral disease diagnosis and BSE surveillance
4. Correctly perform a skin scraping/wool scraping to infectious diseases.
5. Collect blood from the appropriate site in applicable species forserology/immunology.
6. Physically examine animals infected with diseases of veterinary importance toNamibia to avoid disease transmission
7. Implement relevant biosecurity measures and control programs for animals infected with viral and prions diseases of veterinary importance in Namibia

8. Implement vaccination programs for common viral diseases in Namibia
9. List and report notifiable viral and prions diseases of veterinary importance in Namibia as outlined in Animal Health Act 1 of 2011 Regulation (as amended)
10. Perform/ assist the veterinarian with sample collection and various field-based diagnostic procedures, with emphasis on sample handling, packaging, storage and transportation.

Module Content

Viral diseases of veterinary importance: viral diseases in different animal species; aetiology, transmission, epidemiology, pathogenesis, clinical signs, diagnosis, differential diagnosis,
Management, prevention, and control of viral diseasesPrions and prion diseases**.**

Diagnosis of specific viral and prion diseases (including zoonoses) based on appropriate samplecollection, handling and packaging

Treatment and control of fungal diseases**.** Vaccination of common viral diseases in Namibia

Learning and Teaching Strategies/Activities

Blended teaching model through lectures, field and laboratory activities.

Student Assessment Strategies

Continuous Assessment: 40% (Minimum 2 x theory tests assessments, 4 x practical assessments and 1 xassignment/ quiz). CA calculation: Tests 60%; Practical 30%; Assignment/ quiz 10%.
Examination: 60% (1 x 3 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 scriptsStudent 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 examinationsMonitoring and evaluation by relevant professional regulatory bodies.
Upgrading of laboratory facilities following new technology development

Prescribed Learning Resources

Dua Kirti. (2012), ***Infectious Diseases of farm animals***, Oxford, Alpha Science International. Margi Sirois, (2015), ***Laboratory Procedures for Veterinary Technicians***, 6th Edition, Elsevier.
RecommendedLearning resources:
Bassert M. Joanna, Beal D. Angela and Samples M. Oreta, (2018) **Clinical Textbook for VeterinaryTechnicians**, 9th Edition, Elsevier
Glenn J. Songer, Karen W. Post, (2005) ***Veterinary Microbiology*** (Bacterial and Fungal Agents of AnimalDisease, Elsevier/Saunders.
Gregg L. Voigt & Shannon L. Swist, (2012), ***Hematology Techniques & Concepts for VeterinaryTechnicians***, 2nd Edition, Wiley-Blackwell.
Hunter Pamela, ***Vaccination for the control of animal diseases in Southern Africa***, Pamela OberemPublishers.
Markey B. K. et al, (2013***) Clinical Veterinary Microbiology***, 2nd Edition, Mosby/Elsevier
Peter Jackson and Peter Cockcroft, (2002), ***Clinical Examination of Farm Animals*****,** Blackwell Publishing.The Merck's Manual
Cappucino James & Sherman Natalie, (2014) ***Microbiology : A Laboratory Manual***, 10th Edition, PearsonEducation Limited.

Module Title: Livestock and Pet Nutrition	
Module Code	V2551EN
NQF Level	4
Notional Hours	140
Contact hours	Lectures: 4 x 1hr lectures/week Practicals: 1x 3hr practicals every week
Additional learning requirements	1 x field trip
NQF Credits	14
(Co-requisites) **Prerequisite**	V2460EF Field and Laboratory Safety
Compulsory/Elective	Compulsory
Semester Offered	2

Module Purpose

The purpose of this module is to introduce basic concepts in animal nutrition including nutritional requirements for livestock and companion animals, techniques for analyzing the nutritional value of feeds and feed formulation. Preparation and formulation of feeds and rangeland management shall also be discussed.

Overarching Learning Outcome

Advise and discuss the nutritional requirements for ruminant and non-ruminant animal species at different physiological states, assess nutritional value of animal feeds, formulate rations and sustainably manage rangelands.

Specific Learning Outcomes

On completing the module students should be able to:

1. Name the different sources and categories of animal feeds.
2. Identify the different biomes and common forage species (grasses, shrubs and trees) of Namibia including cultivated forages.
3. Discuss the nutritional components of animal feeds and their importance to livestock and companion animals.
4. Discuss the nutritional requirements of different species of livestock and companionanimals in different physiological states and seasons.
5. Discuss the process of feed digestion and absorption of nutrients in ruminant and non-ruminant animals.
6. Discuss the selection of ingredients and their formulation into feeds that meet requirements for growth, production and reproduction in different animal species.
7. Discuss the importance of feed analysis to livestock production.
8. Recognize and correct nutritional disorders in livestock and companion animals.

Module Content

Introduction to animal nutrition: key concepts and terminologies, the role of animal nutrition in animal production, feed intake and factors influencing intake.

Sources and classification of animal feeds: plants, animal.

Feed digestion: monogastric, ruminants and hind gut fermenters.

Nutritional value/components of animal feeds: chemical composition of feeds, laboratory analysis forvarious components.

Nutritional requirements of farm animals in different physiological states and seasons including neonates: livestock and companion animals.

Ruminant nutrition during the dry season/drought compared to the rainy season.Feed formulation: chickens, pigs, cattle, sheep/goats

Nutritional disorders: acidosis, ketosis, bloat, mineral deficiencies including white muscle disease, milk fever**.Rangeland management:** veld types of Namibia and their characteristics, grasses and other forages of Namibia, natural and cultivated forages, principles of rangeland management including carrying capacity, resting of veld, rotation, management of bush encroachment.

Preparation and storage of feedstuff: hay, silage, feed storage, feed additives, contaminants and toxins.

Learning and Teaching Strategies/Activities

Blended teaching mode through lectures, assignments, practicals and field trips.

Student Assessment Strategies

Continuous Assessment: 40% (Minimum 2x theory assessments and 2 x practical assessments: 60% theory,30% practical and 10% assignments and quizzes)

Examination: 60% (1 x 3 hour paper (100%)

Learning and Teaching Enhancement Strategies

Module review in consultation with experts in the subject field

Internal and external moderation of examination papers and answer scriptsStudent evaluation of the module and Lecturers at the end of the semester

Prescribed Learning Resources

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.

Dryden G. M. (Ed.). 2011. **Animal Nutrition Science**, 1st Edition, CABI.

Recommended learning resources

W. G., Church D. C., Pond R. R. and Schoknecht P. A. (Eds.). 2005. **Basic Animal Nutrition and Feeding**, 5thEdition. Wiley & Sons Publishers

Jurgens M., Bregendahl K., Coveldale J. and Hansen S. (Eds.). 2012. **Animal Feeding and Nutrition**, 11thEdition, Kendall Hunt Publishing.

Mugdal V. (Ed.). 2012. **Practical Animal Nutrition**. New Indian Publishing Agency, New Dehli, India. Minson D. J. (Ed.). 1990. **Forage in Ruminant Nutrition**. Academic Press Inc., San Diego, California, USA.

Church D. C. (Ed.). 1988. **The Ruminant Animal – Digestive Physiology and Nutrition**. Prentice-Hall Inc., NewJersey, USA.

Reddy D.V. (Ed.). 2018. **Principles of Animal Nutrition**. Third Edition, CBS Publishers & Distributors Pvt Ltd, India.

Mehra U.R., Singh P. and Verma A. K. (Eds.). 2014. **Animal Nutrition – Advances and Developments**. SatishSerial Publishing House., India.
Tisch D. A. 2006. **Animal Feeds, Feeding and Nutrition, and Ration Formulation with CD Rom.**, ThomsonCorp., USA.
Lesson S. and J.D. Summers (2001). **Scott's nutrition of the chicken**, 4th edition. University Books.
McNab J. M. and Boorman K. N. 2002. **Poultry feedstuffs supply, composition and nutritive value**. CABI.
Orskov E. R. and Ryle M. 1990. Energy nutrition in ruminants. Elsevier Science Publishers.
Lowis A. and Southern L. L. 2000. Nutrition of Swine. Taylor and Francis.

Module Title: Basic Veterinary Epidemiology	
Module Code	V2501EV
NQF Level	5
Notional Hours	70
Contact hours	Lectures: 2 x 1hr L/week for 12 weeks Tutorials: 1 x 2hr tutorial / every 2nd week for 12 weeks
Additional learning requirements	None
NQF Credits	7
(Co-requisites) Prerequisite	V2402EP Animal Parasitology, V2471EI Infectious Animal Diseases I, V2512EI Infectious Diseases II
Compulsory/Elective	Compulsory
Semester Offered	2
Module Purpose	
The purpose of this module is to provide theoretical and practical information on epidemiological methods used in veterinary sciences. Students will be acquainted with basic epidemiological concepts, basic knowledge about the evolution of a disease in a population, disease surveys and basics of disease control, investigation and early warning systems.	
Overarching Learning Outcome	
Demonstrate knowledge and understanding on the epidemiological methods used in veterinary disease management and surveillance	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Describe disease outbreaks and events in populations 2. Discuss various risk factors in disease outbreak and transmission 3. Discuss relevant contingency measures for selected animal diseases in Namibia 4. Discuss the execution of disease control schemes and response plans 5. Describe the principles of disease surveillance 6. Describe the concept of enzootic stability in animal populations	

Module Content

Basic epidemiological concepts, fields of epidemiology, population and its characteristics, emerging and course of a disease in populations; questionnaire administration, basics of disease survey. The importanceof appropriate sampling methods and sample size will be discussed

Evaluation of disease risk factors and mode of disease transmission**;**

Methods of disease control schemes, disease outbreak contingency and response plans, **Basics of disease control and investigation**; monitoring, surveillance and early warning systems.

Learning and Teaching Strategies/Activities

Through lectures, tutorials, case studies.

Student Assessment Strategies

Continuous Assessment: 40% (Minimum 3 theory assessments)Examination: 60% (1 x 2 hour paper)

Learning and Teaching Enhancement Strategies

Module review in consultation with experts in the subject fieldInternal moderation of examination papers and answer scripts

Student evaluation of the module and Lecturers at the end of the semester periodic

Prescribed Learning Resources

Michael Thrusfield (2007). **Veterinary Epidemiology**, 3rd Edition.

H. Houe, AK Ersboll, N Toft (2004). **Introduction to Veterinary Epidemiology.**

Recommended learning resources

G. Joubert AND R. Ehrlich (EDS) (2007). **Epidemiology: A research manual for South Africa**, 2nd editionI

Dohoo, W. Martin AND H Stryhn (2009). **Veterinary Epidemiological Research**, 2nd edition

Module Title: Animal Pathology	
Module Code	V2532EP
NQF Level	5
Notional Hours	140
Contact hours	Lectures: 4 x 1hr L/week for 12 weeks Practicals: 1 x 3hr P / week for 12 weeks
Additional learning requirements	
NQF Credits	14
(Co-requisites) Prerequisite	V2460EF Field and Laboratory Safety, V2471EI Infectious Animal Diseases I, V2411EA Animal Anatomy I, V2412EA Animal Anatomy II (V2512EI Infectious Animal Diseases II)
Compulsory/Elective	Compulsory
Semester Offered	2
Module Purpose	
The purpose of the module is to provide students with knowledge of mechanisms of disease and the macroscopic appearance of diseased organs in comparison to healthy organs. The modules expose students to appropriate tissue sampling.	
Overarching Learning Outcome	
Describe the mechanisms of disease and the macroscopic appearance of diseased organs in comparison to healthy organs. In addition, students will be exposed to appropriate tissue sampling techniques	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Describe common post mortem changes 2. Examine and describe gross lesions using appropriate terminology 3. Describe personal protective and safety measures when performing necropsy withreference to zoonotic diseases such as anthrax 4. Correctly perform a necropsy and complete necropsy report form 5. Collect appropriate samples (microbiology, histopathology, toxicology, parasitology) from vertebrate animals 6. Make brain crush and blood smears 7. Correctly prepare, package, label, store and transport biological samples with required documentation 8. Distinguish between healthy and diseased organ 9. Handle and dispose biological specimen	

Module Content

Introduction to pathology, common post mortem changes such as rigor mortis, putrefaction and bile imbibition.

General pathology, including lesions due to various disease processes, circulatory disturbances, inflammation and neoplasia;

Basic pathology of the major systems (cutaneous, muscular, respiratory, endocrine, skeletal, nervous, reproductive, cardiovascular, gastrointestinal, lymphatic);

Identification of lesions suggestive of a pathological processTechniques used in post mortem examination **Appropriate sampling methods**: collection, packaging, labelling, storage, transport and basic processing. Laboratory content will focus on biosafety and biosecurity, appropriate sample handling.Learning and

Teaching Strategies/Activities

Through integrated lectures, presentations, illustrations, post mortem demonstrations,-class discussions, written assignments and group work.

Student Assessment Strategies

Continuous Assessment: 40% (Minimum 2x theory assessments (50%) and 4 x practical assessments (50%))

Examination: 60% (1 x 3 hour paper (50%) and Practical examination 1 x 2 hours (50%))

Learning and Teaching Enhancement Strategies

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 development

Prescribed Learning Resources

Basic Pathology by V Kumar, R Cotran and S Robbins, 7th edition, 2003. W. B Saunders Company.

Introduction to Veterinary Pathology by N Cheville, 2nd edition 1999, Iowa State Press

Recommended learning Resourses

Mechanisms of Disease by D Slauson and B Cooper, 3rd edition, 2002. Mosby

Pathology of Domestic Animals by K.V.C. Jubb, P.C. Kennedy, and N. Palmer, 4th edition, 1993. Academic Press, San Diego.

Color atlas of veterinary pathology : general morphological reactions of organs and tissues ; 2007, edited by J.E. van Dijk, E. Gruys and J.M.V.M. Mouwen Saunders, New York

General and systematic pathology edited by J.C.E. Underwood, S.S. Cross, 2009, New York, Elsevier

Special Veterinary Pathology by R.G. Thomson, 3rd edition, 2001. BC Decker Publishers .

Module Title: Fundamentals of Animal Reproduction	
Module Code	V2552ER
NQF Level	5
Notional Hours	140
Contact hours	Lectures: 4 x 1hr L/week for 12 weeks Practicals: 1 x 3hr P / week for 12 weeks
Additional learning requirements	None
NQF Credits	14
(Co-requisites) Prerequisite	V2460EF Field and Laboratory Safety, V2432EP Animal Physiology II, V2412EA Animal Anatomy II
Compulsory/Elective	Compulsory
Semester Offered	2
Module Purpose	
The purpose of this module is to introduce students to reproduction of relevant livestock and companion animals in Namibia.	
Overarching Learning Outcome	
Demonstrate an understanding of the reproduction of farm and companion animals, reproduction challenges and their management.	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Describe the reproductive cycles and mating behaviour in various livestock and companion animals 2. Determine when to breed cattle, small stock, pigs and companion animals 3. Explain the importance of assisted animal reproduction in livestock and companion animals 4. Describe the clinical signs and management of relevant livestock reproductive disorders; such as dystocia, abnormal vaginal discharges and or vaginal prolapse 5. Recognise and decide when veterinary intervention is required when dealing withreproductive challenges or disease. 6. Discuss the management of pregnant animals and neonates of various species 7. Assist with collection, handling and transport of sheath scrape samples 8. Assist in artificial insemination, semen collection, handling and transport	

Module Content

The reproductive cycle; cattle, sheep, goats, pigs, dogs and cats,

Assisted reproductive technologies; oestrus synchronisation; artificial insemination using both fresh and frozen semen in cattle

Reproductive diseases and disorders: causes; clinical signs, sampling and management; dystocia; post-partum problems; pregnant; newborn animals

Breeding soundness examination: livestock

Learning and Teaching Strategies/Activities

Through lectures, practicals, visits to different animal farms.

Student Assessment Strategies

Continuous Assessment: 40% (Minimum 2 x theory assessments (60%) and 3 x practical/ assignments/ quiz assessments (40%))

Examination: 60% (1 x 3-hour theory paper (60%) and 1 x 2 hours' practical paper (40%))

Learning and Teaching Enhancement Strategies

Module review in consultation with experts in the subject fieldInternal moderation of examination papers and answer scripts

Student evaluation of the module and Lecturers at the end of the semester periodicUpgrading of laboratory facilities following new technology development

Prescribed Learning materials

Robert E. Taylor, Tom G. Field; (2014), **Scientific Farm Animals Production**: 10th Edition

Kristin Holtgrew- Bohling, (2019): **Large Animal Clinical Procedures for Veterinary Technicians**.; 4th Edition

Recommended Learning Resources

Bassert J.M and Thomas J.A (2013): **Clinical Textbook for Veterinary Technicians**, Eighth edition

Module Title: Animal Health Extension	
Module Code	V2572EX
NQF Level	5
Notional Hours	140
Contact hours	Lectures: 4 x 1hr L/week for 12 weeks Practicals: 1 x 3hr P/ week for 12 weeks
Additional learning requirements	
NQF Credits	14
(Co-requisites) **Prerequisite**	 V2420EQ Veterinary Paraprofessional Skills I
Compulsory/Elective	Compulsory
Semester Offered	2

Module Purpose

The purpose of this module is to teach students how to deliver animal health extension services to farmers and stakeholders in Namibia, using a holistic approach with emphasis on communication (verbal and written) with individuals and groups, as well as body language, compassion and teamwork.

Overarching Learning Outcome

Discuss the techniques used for effective information dissemination and facilitate participatory decision-making process at farmers' meetings, field days and workshops with respect to animal health, production, and welfare.

Specific Learning Outcomes

On completing the module students should be able to:

1. Discuss the techniques used for effective dissemination of information in the livestock sector
2. Discuss the application of participatory rural appraisal (PRA) in communities with respectto animal health
3. Implement a holistic approach in veterinary extension
4. Perform farm inspection and community visits
5. Render advisory services to farmers with regards to animal production, health, and welfare
6. Discuss and apply standards involved in animal gatherings
7. Perform surveillance and monitoring activities at farm/community level
8. Implement and enforce regulated vaccination and parasite control programs.
9. Enforce animal identification and movement control regulations

Module Content

Overview of the effective para veterinary service delivery for the improved productivity of farm animals: information dissemination techniques; principles and use of participatory rural appraisal (PRA)
Standard operational procedures: farm inspection, community visits and animal gatherings
Perform: animal disease surveillance, monitoring and control (vaccination, movements control;inspections, quarantine, livestock census, etc.)
Implement a holistic approach in veterinary extension: integrated agriculture practice, SMART agriculture, husbandry services, animal production, nutrition and reproduction, use of medicines, diseaseand parasite control

Learning and Teaching Strategies/Activities

Through lectures, case studies, and practicals.

Student Assessment Strategies

Continuous Assessment: 40% [Minimum 2 x theory assessments (60%) and 3 x practical/assignment/case study assessments (40%)]
Examination: 60% (1 x 3-hour theory paper)

Learning and Teaching Enhancement Strategies

Module review in consultation with experts in the subject fieldExternal moderation of examination papers and answer scripts
Student evaluation of the module and lecturers at the end of the semester

Prescribed Learning Resources

***Facilitator's Guide to Participatory Decision-Making*.** Third Edition (2014). Sam Kaner with Lenny Lind, Catherine Toldi, Sarah Fisk, and Duane Berger
Ban, A. W. van den. ***Agricultural Extension***, Burnt Mill, Harlow, Essex, England : Longman Scientific & Technical New York : Wiley, 1988. 1

Module Title: Veterinary First Aid	
Module Code	V2522EF
NQF Level	5
Notional Hours	140
Contact hours	Lectures: 2 x 1hr L/week for 12 weeks Practicals: 1 x 3hr practical / alternate week for 12 weeks
Additional learning requirements	
NQF Credits	7
(Co-requisites) Prerequisite	V2460EF Field and Laboratory Safety, V2420EQ Veterinary Paraprofessional Skills I
Compulsory/Elective	Compulsory
Semester Offered	2

Module Purpose

The purpose of this module is to expose students to emergency first aid treatment and general patient management, common veterinary obstetrical problems of farm animals will be discussed.

Overarching Learning Outcome

Perform common emergency first aid treatment and patient management. Common obstetric problems will be discussed.

Specific Learning Outcomes

On completing the module students should be able to:

1. List and identify basic equipment and content of a first aid kit needed for emergency management of farm animals
2. Describe the basic aseptic preparations for surgical interventions
3. Monitor an animal under anaesthesia
4. Describe pre-operative and post-operative care of patients
5. Resuscitate neonates and adult animals using non-surgical procedures
6. Stabilise broken bones and dislocated joints using appropriate methods
7. Provide emergency care such as allergic reactions, poisoning, burns, bleeding, bloat, colic, diarrhea, constipation , dehydration, choke, hyperthermia, near drowning and snake bite
8. Describe the management of different types of wounds.
9. Explain how to manage a downer cow
10. Recognise when a veterinarian intervention is required

Module Content

Basic equipment and first aid kit needed for emergency management of farm animals and their use; gloves, nasogastric tube, trocar & cannula bandaging material, catheters, surgical kit, stethoscope, thermometer, veterinary drugs (antibiotics, analgesics, sedatives), , blades/ clippers, cotton wool, needles, syringes, etc.

Aseptic preparations for field surgical procedure; patient and surgeon preparation, including patient and surgeon scrubbing, gowning, gloving, draping, and Halsted principles.

Basic principles of anaesthesia; the anaesthetist's role for safe anaesthetic management of patients, patient evaluation; knowledge of premedication, induction and maintenance, anaesthetic drugs; monitoring depth of anaesthesia

Basic emergency procedures such as resuscitation, splinting and stabilisation of broken bones and dislocated joints, bandaging, management of allergic reactions, poisoning, burns, bleeding and bloat, colic, diarrhoea, constipation , dehydration, choke, hyperthermia, near drowning, snake bite, management of a downer cow.

Wound management; stages of wound healing and associated complications; wound evaluation, lavage, debridement, drainage, and closure

Pre and post-operative patient care

Learning and Teaching Strategies/Activities

Blended teaching model through lectures, practicals and class discussions.

Student Assessment Strategies

Continuous Assessment: 40% (Minimum 2x theory assessments and 3x practical assessments), CA calculation: Tests 60% practical assessments 40%.

Examination: 60% (1 x 2 hour paper: 60% and 1x 2hr practical exam: 40%)

Learning and Teaching Enhancement Strategies

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 development

Prescribed Learning Resources

Cooper, B., Mullineaux, E., & Turner, L. (2020). ***BSAVA textbook of veterinary nursing*.** BSAVA.

Ford, R. B. (2012). ***Kirk and Bistner's handbook of veterinary procedures and emergency treatment*.**

Recommended Learning Resources:

Glover, A. (2013). ***The A to Z of first aid and emergency care for dogs and cats: How to save an ill or injured pet***. CreateSpace

Sonsthagen, T. F. (2013). ***Veterinary instruments and equipment: A pocket guide***. Elsevier Health Sciences.

Kahn, C. M., & Line, S. (2007). ***The Merck/Merial manual for pet health: The complete health resource for your dog, cat, horse or other pets - in everyday language***. Simon & Schuster.

VPIS, B. /. (2014). ***BSAVA / VPIS guide to common canine and feline poisons***. BSAVA.

Forse, B. (1999). ***Where there is no vet*.** Oxfam Publications.

Module Title: Livestock Entrepreneurship	
Module Code	V2600EA
NQF Level	6
Notional Hours	60
Contact hours	6 hours Integrated lectures and tutorials per week for 6 weeks
Additional learning requirements	None
NQF Credits	8
(Co-requisites) Pre-requisite	None
Compulsory/Elective	Compulsory
Semester Offered	Core 3
Module Purpose	
The purpose of this module is to introduce students to various livestock entrepreneurial, traits, process and skills that facilitate sustainable business establishment as a choice of self-employment and job creation in accordance to the Namibian Veterinary legislation.	
Overarching Learning Outcome	
Apply knowledge of entrepreneurial process, concepts, and skills.	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Define an entrepreneur and business owner. 2. Discuss the variety of personality characteristics that contribute to entrepreneurialsuccess in business. 3. Discuss the marketing of livestock and livestock products, their micro-economic andmacro-economic environment. 4. Discuss the link between e-commerce and entrepreneurship. 5. Outline the role of SME businesses in the economy. 6. Identify livestock and livestock products related business opportunities. 7. Prepare and evaluate livestock related business plans.	

Module Content

Types of entrepreneurship; family business, social entrepreneurship, intrapreneurship, sole trader.

Importance of entrepreneurship; forces and ideas that lead to business establishment, growth and survival, role of entrepreneurship in the economy

Entrepreneurial process; Business incubation, sources of entrepreneurship, the entrepreneur's characteristics, traits and motivation, innovation

Developing entrepreneurial skills; Strength Weakness Opportunity Threats (SWOT) analysis, business opportunity identification, opportunity assessment and evaluation, management competencies, entrepreneurial start-up, marketing, financial management

Business management; Government policies (Small and Medium Enterprise (SME), production functions, optimum resource allocation, profit maximization, economies of size and scale, demand and supply, infant protection

Learning and Teaching Strategies/Activities
Lectures, tutorials, written assignments, group work, case studies.

Student Assessment Strategies
Continuous Assessment 100%: (Minimum 2 x theory (60%) and 1 x assignment assessment (40%)).

Learning and Teaching Enhancement Strategies
Programme review in consultations with experts in the fieldExternal examiner and/or moderation
Student evaluation and supervisionRegular review of module content

Recommended Learning Resources
Small Business Management: A South African approach; Gideon Nieman; 2nd Edition, 2009; Van Schaik Publishers ISBN: 0-627026176-13/ digit ISBN 978 0627026171
Management Principles: P.J. Smit, T. Botha, M.J. Vrba and Hellicy Ngambi; 6th Edition, 2018. Juta and Company (Pty) Ltd. ISBN: 9781485121251
Writing a Business Plan: How to win backing to start up or grow your business; Vaughan Evans, 2011. Pearson Education Ltd. ISBN: 978-0-273-75798-6 (pbk)
Family Business: 2nd Edition, 2007. Ernesto J. Poza. Thompson South-Western. ISBN: 13:978-0-324-31703-9/ 10:0-324-31703-4
Cost-Benefit Analysis: 2nd Edition, 1996. Edited by Richard Layard and Stepen Glaister. Cambridge University Press. ISBN: 0521461286 (hbk)/ 0521466741 (pbk)
Project Management: Absolute Beginners' guide; 3rd Edition, 2013. Gregory M. Horine. ISBN: 13:978-0-7897-5010-5/ 10:0-7897-5010-4
The Winning Code: How to become a winner in the game of Life. 1st Edition, 2014. Published by Jimmy Roos ISBN: 978-99945-78-77-1
Business Ethics. 3rd Edition, 2010. Andrew Crane and Dirk Matten. Oxford University press. ISBN: 978-0-19-956433-0

Module Title: Veterinary Para-professional skills II	
Module Code	V2620EQ
NQF Level	6
Notional Hours	80
Contact hours	6 hours blended lectures and tutorials per week for 6 weeks
Additional learning requirements	None
NQF Credits	8
(Co-requisites) Prerequisite	V2420EQ Veterinary Para-Professional Skills I
Compulsory/Elective	Compulsory
Semester Offered	Core 3
Module Purpose	
The purpose of this module is to provide students with soft skills for veterinary paraprofessionals in order to improve their effectiveness in the workplace	
Overarching Learning Outcome	
Demonstrate skills specific to a future career as a Veterinary paraprofessional.	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Describe how to manage self and client stress effectively 2. Recognize and respond appropriately to the human-animal bond between clients and patients 3. Apply the veterinary paraprofessional regulations as stipulated in the veterinary and veterinary paraprofessional Act (Act 1 of 2013) 4. Explain how to prevent negative impact of various paraprofessional activities on the environment suchas responsible use of chemical and disposal of hazardous wastes 5. Keep record of activities undertaken6. . 6. Apply fundamental ethical principles and meaning in personal life, studies and the workplace. 7. Critically assess the relationship between theory and practice in ethics and morality. 8. Evaluate the relationship between taking moral responsibility and being ethical, and how this applies to one's own life and decision-making. 9. Identify ethical risks in personal life, studies and workplace that can lead to unethical behavior.	

Module Content

Client communication: Listening skills; verbal and non-verbal communication

Veterinary ethics

Effective conflict management strategies Environmental awareness and sustainabilityRecord keeping

Learning and Teaching Strategies/Activities

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

Student Assessment Strategies

Continuous Assessment: 100 %, minimum 2 marked assignments for final CA mark (written assignment, group assignment, role-play and / or presentation).

Learning and Teaching Enhancement Strategies

Module review in consultation with experts in the subject field

Internal and external moderation of examination papers and answer scriptsStudent evaluation of the module and Lecturers at the end of the semester

Prescribed Learning Resources

Reading material will be supplied by the lecturer.

Recommended Learning resources:

PUN, J.K.H. **An integrated review of the role of communication in veterinary clinical practice.** BMC Vet Res 16, 394 (2020). https://doi.org/10.1186/s12917-020-02558-2

Module Title: Legislation and Jurisprudence	
Module Code	V2640EG
NQF Level	6
Notional Hours	80
Contact hours	6 hours Integrated lectures and tutorials per week for 6 weeks
Additional learning requirements	None
NQF Credits	8
(Co-requisites) Pre-requisite	None
Compulsory/Elective	Compulsory
Semester Offered	Core 3
Module Purpose	
This module aims to provide the students with information and knowledge on the relevant Namibian legislation pertaining to veterinary para-profession.	
Overarching Learning Outcome	
Apply relevant Namibian legislation pertaining to veterinary para-profession.	
Specific Learning Outcomes	
On completing the module students should be able to: 1. Interpret, ensure compliance with relevant Namibian Acts and Legislation as amended 2. Implement relevant legislation as related to the practice of veterinary para-profession in Namibia 3. Understand veterinary ethics and distinguish between unethical and unprofessional conduct 4. Differentiate between policy, legislation and regulations 5. Discuss processes involved in the formulation of public policy and legislation	

Module Content

Relevant aspects of Namibian legislation pertaining to the activities of veterinary paraprofessionals: Animal Health Act, Act 1 of 2011; Animal Protection Act, Act 12 of 1962; Veterinary and Veterinary Paraprofessionals Act, Act 1 of 2013; Meat Industry Act (Act 12 of 1981) as amended, Prevention of Undesirable Residues in Meat Act, Act 21 of 1991; Medicines and Related Substances Control Act, Act 13 of 2003; Stock Brands Act, Act 24 of 1995; Environmental Management Act (Act 7 of 2007); UNAM code of conduct for veterinary paraprofessionals.

Learning and Teaching Strategies/Activities

Through lectures, tutorials, and class discussions.

Student Assessment Strategies

Continuous Assessment 100%: (Minimum 2 x theory (60%) and 1 x assignment assessment (40%))

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

Veterinary and Veterinary Paraprofessionals Act, Act 1 of 2013;

Animal Health Act, Act 1 of 2011 including supporting Regulations; Animal Protection Act, Act 12 of 1962; Prevention of Undesirable Residues in Meat Act, Act 21 of 1991; Medicines and Related Substances Control Act, Act 13 of 2003; Stock Brands Act, Act 24 of 1995;

UNAM students code of conduct Environmental Management Act (Act 7 of 2007) Meat Industry Act (Act 12 of 1981) as amended

Recommended Learning Resources:

Dua Kirti, (2003), ***Veterinary Ethics and Jurisprudence***, Kalyani Publishers

Module Title: Paraprofessional Rotations	
Module Code	V2683ET
NQF Level	6
Notional Hours	1400
Contact hours	28 Weeks, all practical
Additional learning requirements	All practical training in different rotations
NQF Credits	140
(Co-requisites) Prerequisite	All Year 1 and Year 2 modules
Compulsory/Elective	Compulsory
Semester Offered	1 and 2

Module Purpose

The purpose of this module is to develop and enhance student's skills in notifiable animal disease surveillance, reporting and control; regulatory work; animal identification; advisory and extension services; meat inspection and food safety procedures; and import and export controls and to fulfil the 'Day 1' competency requirements of the Namibian Veterinary Council.

Overarching Learning Outcome

Comply with all specified 'Day 1' competencies of a veterinary health technician as stipulated in Namibian legislation.

Specific Learning Outcomes

On completing the module students should be able to:

1. Perform all 'Day 1' competencies for a veterinary paraprofessional (VHT) as stipulated by theNamibia Veterinary Counci
2. Perform animal health reproduction techniques.
3. Discuss herd and flock health management.
4. Perform the most common production animal procedures.
5. Describe, recommend, implement and evaluate farm biosecurity and animal health extension.
6. Perform veterinary first aid.
7. Understand and execute the duties of a Veterinary Paraprofessional in state veterinary practice.
8. Monitor and evaluate Abattoir hygiene, conduct meat inspection and outline and implement food safety procedures.

Module Content

Intensive rotations (28 weeks): students will be exposed to rotations under supervision of registered professional veterinarian (s) and other experts in order to attain 'Day 1' competencies. Students taking this option are required to successfully complete all specified rotations.

Learning and Teaching Strategies/Activities

Through experiential learning – observation and hands-on practical training at specified stations.

Student Assessment Strategies

Continuous assessment: Compulsory submission of completed and signed logbook. Marking rubrics designed for each rotation (subminimum for each rotation 40% to allow admission into the final examination).

Examination: 100%

Two theory paper: 1 x 3hr theory examination 50% (each contributing 25%);Practical two sessions:
Laboratory practical, 1x3 hours 100%, 25% contribution to final mark, with 50%subminimum;
Field practical, 1x3 hours 100%, 25% contribution to final mark with 50% subminimum).
A candidate has to score 50% or more in both the theory and practical sections to pass the examination.

(Subminimum: Theory 40%, Practical 50%, Candidates with a final mark of 45-49% will qualify foran oral examination)

Learning and Teaching Enhancement Strategies

Continuous review of rotations in consultation with supervisors and experts at rotation stations.All examinations are subject to internal and external moderation.
Student evaluation of the module and lecturers at the end of the semester will also inform any changes.

Prescribed Learning Resources

All learning resources provided from year 1 to year 2 of the Diploma in Animal Health program.

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