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NATIONAL UNIVERSITIES COMMISSION

BENCHMARK MINIMUM ACADEMIC STANDARDS

For

UNDERGRADUATE PROGRAMMES

In

NIGERIAN UNIVERSITIES

VERTERINARY MEDICINE

NOVEMBER 2014

PREFACE

Section 10 (1) of the Education (National Minimum Standards and Establishment of Institutions) Act, Cap E3, Laws of the Federation of Nigeria 2004, empowers the National Universities Commission to lay down minimum standards for all programmes taught in Nigerian universities. In 1989, the Commission, in collaboration with the universities and their staff, developed minimum academic standards for all the programmes taught in Nigerian universities and the Federal Government subsequently approved the documents.

After more than a decade of using the Minimum Academic Standard (MAS) documents as a major instrument of quality assurance, the Commission in 2001 initiated a process to revise the documents. The curriculum review was necessitated by the fact that the frontiers of knowledge in all academic disciplines had been advancing with new information generated as a result of research. The impact of Information and Communication Technologies on teaching and learning and the dynamics of the skills set required to face the challenge of competition engendered by globalization were also compelling reasons for the curriculum review.

Other compelling reasons included the need to update the standard and relevance of university education in the country as well as to integrate entrepreneurial studies and peace and conflict studies as essential new platforms that will guarantee all graduates from Nigerian universities the knowledge and appropriate skills, competencies and dispositions that will make them globally competitive and capable of contributing meaningfully to Nigeria's socio-economic development.

Recognising that the content-based MAS documents were rather prescriptive, a decision was taken to develop outcome-based benchmark statements for all the programmes in line with contemporary global best practice. To actualize this, the Commission organized a stakeholders' workshop to benchmark each programme in all the disciplines taught in Nigerian universities. Following comments and feedback from critical stakeholders in the universities indicating that the Benchmark-style Statements were too sketchy to meaningfully guide the development of curricula and were also inadequate for the purpose of accreditation, the Commission put in place the mechanism for the merger of the Benchmark-style Statements and the revised Minimum Academic Standards into new documents referred to as the Benchmark Minimum Academic Standards (BMAS).

The resultant documents, an amalgam of the outcome-based Benchmark statements and the content-based MAS clearly enunciates the learning outcomes and competencies expected of graduates of each academic programme without being overly prescriptive while at the same time providing the requisite flexibility and innovativeness consistent with institutional autonomy.

The first step in the process of amalgamation of the Benchmark statements and the content-based MAS was the conduct of a needs assessment survey and the publication of the findings in the report titled *Needs Assessment Surveys of Labour Market for Nigerian Graduates*. This was carried out for all the disciplines taught in Nigerian universities. The exercise involved major stakeholders particularly employers of Nigerian graduates. The objectives of the Needs Assessment Survey included identification of expected knowledge, attitudes and skills for graduates and their ability to fit into the requirements of the new national and global economy. The second stage was the organisation of a workshop at which academic experts across Nigerian universities, including Vice-Chancellors, participated with the objective of

ensuring that the designed BMAS for the various disciplines took into cognizance the identified knowledge and skill gaps. At the end of the workshop, draft BMAS documents were produced for the various programmes in the thirteen broad academic disciplines into which the Nigerian University System has been structured. Of significance was the introduction of science- and social science/humanities-based courses under the General Studies programme which are compulsory for all first- year students in Nigerian universities, irrespective of their course of study.

The documents were later sent to the Universities offering relevant disciplines for comments and input. Following the collation of the input and comments from the Universities, another workshop was held at which invited academic experts studied and incorporated the relevant comments and input received into the draft documents.

After content and language editing, by relevant experts, a one-day workshop was held at which the edited documents were harmonized to produce the final BMAS documents.

Consequent upon the afore-mentioned processes, BMAS documents were produced for the under-listed academic disciplines:

- i. Administration; Management and Management Technology;
- ii. Agriculture, Forestry, Fisheries and Home Economics;
- iii. Arts;
- iv. Basic Medical and Health Science;
- v. Education;
- vi. Engineering and Technology;
- vii. Environmental Sciences;
- viii. Law;
- ix. Pharmaceutical Sciences;
- x. Medicine and Dentistry;
- xi. Science;
- xii. Social Sciences; and
- xiii. Veterinary Medicine.

For each programme, the document contains suggestions of the status of each course in terms of *compulsory*, *required* and *elective*. Universities are encouraged to take due cognizance of the BMAS while bringing necessary innovation into the content and delivery of their programmes towards achieving their overall objectives and goals. Programmes are to be structured in such a way that a typical student does not carry less than 30 credit units or more than 48 credit units per session.

It is the Commission's expectation that this BMAS document will serve as a guide to the universities in the design of curricula for their programmes in terms of the minimum acceptable standards of input, process as well as measurable benchmark of knowledge, skills and competences expected to be acquired by an average graduate of each of the academic programmes.

Professor Julius A. Okojie, OON
Executive Secretary

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GLOSSARY OF COURSE CODES

These are the 3-letter codes for the identification of courses offered in the Veterinary Medicine programmes as well as courses offered in other disciplines covered in the BMAS for the Nigerian University System. They are in three categories dictated by the sources of courses involved:

Category A: Course codes for courses offered in programmes outside the Veterinary Medicine Discipline

Category B: Course codes for the general and foundation courses offered by students registered in Veterinary Medicine.

Category C: Course codes for courses offered by the various subjects in the Veterinary Medicine Discipline.

Category A:

The Programme offering the Courses	Course Code
Chemistry Programme in the Science Discipline	CHM
Physics Programme in the Science Discipline	PHY
Biology Programme in the Science Discipline	BIO

Category B:

The Programme offering the Courses	Course Code
General Studies Courses offered at the University Level for students registered for courses in all the disciplines in the university.	GST
Animal Husbandry and Management	ANP
Externship and Rural Posting	EXT

Category C:

The Programme offering the Courses	Course Code
Veterinary Anatomy	VAN
Veterinary Biochemistry	VBC
Veterinary Physiology	VPY
Veterinary Microbiology	VMB
Veterinary Parasitology	VPE
Veterinary Pharmacology	VPC
Veterinary Pathology	VPT
Veterinary Medicine	VMD
Veterinary Surgery	VSR
Veterinary Theriogenology	VTG
Veterinary Public Health	VPH
Veterinary Preventive Medicine	VPM
Aquatic and Wildlife Medicine	AVM

SECTION ONE:

BASIC ELEMENTS OF THE OPERATION OF THE BENCHMARK MINIMUM ACADEMIC STANDARDS IN VETERINARY MEDICINE

1.1 Preamble

These Benchmark Minimum Academic Standards (BMAS) are designed for the education and training of undergraduate students wishing to obtain first degree in Veterinary Medicine in the Nigerian university system. Presented in this Section are the basic operational elements that serve to define the minimum academic standards required to achieve the cardinal goal of producing graduates in Veterinary Medicine with sufficient academic background, practical and clinical exposure to face the challenges of a developing economy in the increasingly globalised world economy.

It is pertinent to note that this BMAS Document is expected to guide institutions in the design of curricula for their Veterinary medicine Programme by stipulating the minimum requirements. Being such, institutions are encouraged to take due cognizance of the BMAS while bringing necessary innovation into the content and delivery of their programmes towards achieving the overall goals of Veterinary Medicine education and training in the country.

1.2 Programmes and Degrees

Presented in Table 1.1 is the degrees in view covered in this current BMAS Document. The veterinary medicine training in Nigeria is currently a single-track degree programme and is presented as such in the current BMAS document. This is based on the current level of Nigeria's manpower requirement in the livestock industry. A multi-tack programmes with specialization in Food Animal Medicine, Companion Animal Medicine and Aquatic and Wild Animal Medicine options as obtain in European and American Universities should be considered for Faculties of Veterinary Medicine in Nigerian Universities in the nearest future.

However, an attempt has been made to introduce such new courses as veterinary economics and business management, aquatic and wildlife medicine, and veterinary pharmacy. In addition, new topics are added into courses being currently offered in existing faculties of Veterinary Medicine with a view to equipping the veterinary graduates with requisite knowledge and skills to face new challenges on the field and in response to the local and global dynamics.

Overall, the current edition of BMAS is expected to serve the needs of existing faculties contemplating minor or major programme review and also new institutions seeking to chart a new path in the training of veterinary doctors.

The above programmes are designed, in general, to be broad-based to equip the products with the diverse tools of the profession.

As at 2011, there were ten (10) universities in the Nigerian university system with approval by NUC to run the Veterinary Medicine programme.

List of Programmes and Degrees in View

S/N	PROGRAMME	DEGREES IN VIEW
1.	Doctor of Veterinary Medicine	D.V.M

1.3 Philosophy and Objectives of the Discipline

1.3.1 Philosophy and Mission Statement

The philosophy and mission statement underlying the programme in Veterinary Medicine is aimed at achieving the goal and objectives of the national policy on food security, animal health and public health in the context of global best practice of “one-health”.

This is to be realized through:

- i. Broad and balanced foundation of veterinary medical knowledge and practical skills with applications;
- ii. Ability to apply knowledge and skills to solve clinical and disease prevention problems in a wide range of animal species;
- iii. Developing in the products, a range of transferable skills that are of value in veterinary medical and non-veterinary employment;
- iv. Creating in the products, entrepreneurial knowledge, a sense of public responsibility and a spirit of self-reliance;
- v. Creating an awareness and understanding of the moral, ethical, legal, and professional obligations needed to function as part of a professional enterprise while protecting animal health and welfare and the environment in a global society;
- vi. Nurturing partnership between the institution and the Veterinary establishments for effective Veterinary Medicine training programme delivery;
- vii. Developing an awareness and understanding of the need to develop leadership and team building skills to maximize the benefits of Veterinary Medicine through global best practices and its application in solving problems.

The general philosophy therefore is to produce graduates with high academic and ethical standards and adequate practical and clinical exposure for self-employment as well as being of immediate value to the livestock industry and the community in general.

1.3.2 Aims and Objectives

The general aims and objectives of Veterinary Medical education and training philosophy and mission statement underlying the programme in veterinary medicine is aimed at achieving the goal and objectives of the national policy on food security, animal health and public health in the context of global best practice of “one-health”.

The graduates must therefore be resourceful, creative, knowledgeable and able to perform the following functions:

- i) To be able to apply and compare the knowledge of normal body function, pathophysiology mechanism and natural history of important domestic and non-domestic animal disease manifestation in a diverse global society;

- ii) To be able to use problem solving skills to analyze a patient and to synthesize a diagnosis or differential diagnosis by applying appropriate use of clinical laboratory testing;
- iii) To be able to apply anesthesia, manage pain, relieve animal suffering and apply basic surgery skills in case management;
- iv) To be able to apply basic medicine skills and to evaluate cases, develop a comprehensive treatment plan and patient referral when indicated;
- v) To be able to manage emergency and intensive cares;
- vi) To identify ways to prevent disease, identify organisms that require biosecurity measures, identify zoonotic disease and food safety issues and to promote awareness of the public and animal health;
- vii) To be able to carry out client communications and ethical conduct as it relates to patient/client communications and proper interactions with a diverse population of clients; and
- viii) To be able to manage people, fund, materials and equipment.

1.4 **Basic Admission Requirements**

Candidates are admitted into the degree programmes in any of the following three ways:

- The Unified Tertiary Matriculation Examination (UTME)
- Direct Entry
- Inter-University Transfer

1.4.1 **UTME Entry Mode**

The minimum academic requirement is credit level passes in five subjects at O'Level in nationally recognised examination including English Language, Mathematics Physics, Biology and Chemistry at not more than two sittings. It is also desirable for candidates to have Agricultural Science at credit level.

1.4.2 **Direct Entry Mode**

For Direct Entry, candidates must possess at least two GCE Advanced level/IJMB passes in Chemistry, Biology/Zoology, with Physics or Mathematics as combination. Special consideration is given to candidates with first degrees in Zoology, Basic Medical Sciences and Animal Husbandry/Production. Holders of OND and HND in Animal health at minimum of upper credit level are eligible for consideration for admission into 100- and 200 levels respectively, provided the candidates have met the O/L requirements.

1.4.3 **Inter-University Transfer Mode**

Students can transfer into 200-Level courses provided they have the relevant qualifications. Universities are to satisfy themselves that the grades obtained by such candidates are acceptable.

1.5 **Minimum Duration**

Doctor of veterinary Medicine Programme

The minimum duration of training in Veterinary Medicine programme is six academic sessions for candidates who enter through the UTME Mode. Direct Entry candidates

admitted to the 200 level of their programmes will spend a minimum of five academic sessions.

1.6 Graduation Requirements

1.6.1 Course System

Credits are weights attached to a course. One credit is equivalent to one hour per week per semester of 15 weeks of lectures or three hours of laboratory/studio/workshop work per week per semester of 15 weeks

1.6.2 Definition of Course System

This should be understood to mean a quantitative system of organization of the curriculum in which subject areas are broken down into unit courses which are examinable and for which students earn credit(s) if passed. The courses are arranged in progressive order of difficulty or in levels of academic progress. There shall be six levels of courses numbered 101-199, 201-299, 301-399, 401-499, 501-599 and 601-699. For easy of identification, course numbers can be prefixed by a three-character programme/subject code. Thus, the course code is in the form: DEP LNJ (where the three letters DEP identify the subject, 'L' in LNJ represents the level of the course (1 or 2 or 3 or 4 or 5 or 6 for all undergraduate courses) and NJ is a two-digit numbering of courses. Thus, for example, VSR505 is a 500-Level course with number 05 offered in veterinary surgery. Refer to glossary of course code.

The second aspect of the system is that courses are assigned weights allied to Units.

Units

Consist of specified number of student-teacher contact hours per week per semester. Units are used in two complementary ways: one, as a measure of course weighting, and the other, as an indicator of student work load.

- (i) As a measure of course weighting for each Unit course (e.g HIS 105, ZOO 203, ARCH 504), the credit unit to be earned for satisfactorily completing the course is specified; e.g. a 2-credit unit course may mean two 1-hour lecture per week per semester or one 1-hour lecture plus 3-hour practical per week per semester.
- (ii) As a measure of work load, "One Credit Unit" means one hour of lecture or one hour of tutorial per week per semester. For other forms of teaching requiring student teacher contact, the following equivalents may apply:

two hours of seminar: three hours of laboratory or field work, Clinical practice/practicum, studio practice or stadium sporting activity, six hours of teaching practice; four weeks of industrial attachment where applicable.

Normally, in Course Credit System, courses are mounted all year round, thus enabling students to participate in examinations in which they are unsuccessful or unable to participate on account of ill health or for other genuine reasons. In such a system, no special provisions are made for re-sit examinations.

The minimum number of credit units for the award of a degree is 120 units, subject to the usual Department and Faculty requirements. A student shall therefore qualify for the award of a degree when he has met the conditions.

The minimum credit load per semester is 15 credit units.

For the purpose of calculating a student's cumulative GPA(CGPA) in order to determine the class of Degree to be awarded, grades obtained in **ALL** the courses whether compulsory or optional and whether passed or failed must be included in the computation.

Even when a student repeats the same course once or more before passing it or substitutes another course for a failed optional course, grades scored at each and all attempts shall be included in the computation of the GPA. Pre - requisite courses must be taken and passed before a particular course at a higher level.

1.6.3 Standard Terminologies

The following standard terminologies are used for different categories of courses.

i. **Core/Compulsory Course:**

A course which every student must compulsorily take and pass in any particular programme at a particular level of study.

ii. **Elective Course**

A course that students take within or outside the faculty. Students may graduate without passing the course provided the minimum credit unit for the course had been attained.

iii. **Optional Course**

A course which students can take based on interest and may count towards the minimum credit unit required for graduation.

iv. **Pre-requisite Course**

A course which student must take and pass before taking a particular course at a higher level.

v. **Required Course**

A course that you take at a level of study and must be passed before graduation.

1.6.4 Grading of Courses

Grading of courses shall be done by a combination of percentage marks and letter grades translated into a graduated system of Grade Point as shown in Table 1.1. The passing grade in core courses in Veterinary Medicine is 50%.

Grade Point System

Mark %	Letter Grade	Grade Point
70 – 100	A	5
60 – 69	B	4
50 – 59	C	3
45 – 49	D	2

40 – 44	E	1
< 40	F	0

1.6.5 Grade Point Average and Cumulative Grade Point Average

For the purpose of determining a student's standing at the end of every semester, the Grade Point Average (GPA) system shall be used. The GPA is computed by dividing the total number of Units x Grade Point (TUGP) by the total number of units (TNU) for all the courses taken in the semester as illustrated in Table 1.2.

The Cumulative Grade Point Average (CGPA) over a period of semesters is calculated in the same manner as the GPA by using the grade points of all the courses taken during the period. It is important to note that the CGPA shall be calculated and expressed correct to two decimal places.

Calculation of GPA or CGPA

Course	Units	Grade Point	Units x Grade Point (UGP)
C ₁	U ₁	GP ₁	U ₁ x GP ₁
C ₂	U ₂	GP ₂	U ₂ x GP ₂
-	-	-	-
-	-	-	-
C _i	U _i	GP _i	U _i x GP _i
-	-	-	-
-	-	-	-
C _N	U _N	GP _N	U _N x GP _N
TOTAL	TNU		TUGP

$$TNU = \sum_{i=1}^N U_i \quad TUGP = \sum_{i=1}^N U_i * GP_i \quad GPA = \frac{TUGP}{TNU}$$

1.6.6 Degree Classifications

The Doctor of Veterinary Medicine degree is unclassified. However, a candidate who demonstrated an excellent performance (an average of 70% score in all courses or GPA/CGPA of 4.50-5.00) in a Subject may be awarded a Distinction in that Subject. However, the following regulations shall govern the conditions for the award of the DVM degree.

- i. Candidates must have registered and passed all the compulsory and required courses specified for the programme.
- ii. Compulsory courses failed at any one phase may not be carried into the next phase.
- iii. Students must satisfy the provisions of the Professional conduct as required for registration with the Veterinary Council of Nigeria.
- iv. The maximum length of time award for the Doctor of Veterinary Medicine shall be eighteen semesters for the 6-year degree programme and fourteen semesters for students admitted directly into the 200 level.
- v. Students who transfer from other universities shall be credited with only those courses deemed relevant to the programmes, which they have already passed

prior to their transfer. Such students shall however be required to pass the minimum number of units specified for graduation for the number of sessions he/she has spent in the Faculty; provided that no student shall spend less than five sessions (10 semesters) in order to earn a degree. Students who transfer from another programme to the DVM programme for any approved reason shall be credited with those units passed that are within the curriculum of the programme to which he/she has transferred. Appropriate decisions on transfer cases shall be subjected to the approval of Senate on the recommendation of the Faculty.

1.6.7 **Probation**

A student whose Cumulative Grade Point Average is below 2.0 for the DVM programme at the end of a particular year of study, earns a period of probation for one academic session. A student on probation is allowed to register for courses at the next higher level in addition to his/her probation level courses provided that:

- i. the regulation in respect of student work-load is complied with; and
- ii. the pre-requisite courses for the higher level courses have been passed.

1.6.8 **Withdrawal**

A candidate whose Cumulative Grade Point Average is below 2.0 for the DVM programme at the end of a particular year of probation should be required to withdraw from the DVM.

1.7 **Evaluation**

1.7.1 **Techniques of Student Assessment**

a) **Practicals and Clinics**

By the nature of the discipline of Veterinary Medicine, laboratory practicals and clinics are very important in the training of students. To reflect the importance of practical work, a minimum of 9 hours per week (equivalent to 3 units) should be spent on students' laboratory practicals at pre- and para-clinical phases and a minimum of 30 units period at the Clinical phase. Consequently, some of the courses have both theory and practical/clinic components. Thus, in the description of courses to be taken in any programme, as presented in Sections 2 and 3, the number of lecture contact hours (LH) and the number of practical contact hours (PH) per semester are indicated. The overall performance of students in such courses is to be based on the evaluation of the performance in written examination (tests theory) and also the performance in the laboratory and clinical work (based on actual conduct of animal dissection, experiments, clinical case evaluation, diagnosis, management interventions and the reports).

The experiments, dissections, clinical case evaluations, diagnoses and management interventions to achieve the practical components of the courses must be designed in quality and quantity to enrich the grasp of the theoretical foundations of the courses. It is left for the department to organize all the practicals in the best way possible. One of the ways to achieve this is to lump all the laboratory practicals or clinics under a course, which the student must pass.

b) **Tutorials**

The timetable for courses shall be designed to make provision for tutorials of at least one hour for every four hours of lecture. Thus a 3-unit course of 45 hours per week should attract about 10 hours of tutorials.

c) **Continuous Assessments**

Continuous assessment shall be done through essays, tests, and practical exercises.

- i. Scores from continuous assessment shall normally constitute 30% of the full marks for courses which are primarily theoretical.
- ii. For courses which are partly practical and partly theoretical, scores from continuous assessment shall constitute 40% of the final marks.
- iii. For courses that are entirely practical or clinics, continuous assessment shall be based on a student's practical work or reports and shall constitute 100% of the final marks.

d) **Examinations**

In addition to continuous assessment, final examinations should normally be given for every course at the end of each semester. All courses shall be graded out of a maximum of 100 marks comprising:

Final Examination: 70% - 60%

Continuous assessment (Quizzes, Homework, Tests): 30% - 40%

Each course shall normally be completed and examined at the end of the semester in which it is offered. A written examination shall normally last a minimum of one hour for one unit course.

1.7.2 **External Examiners' System**

The involvement of external examiners from other universities is a crucial quality assurance requirement for all courses in Nigerian University System. In this regard, external examiner should go beyond mere moderation of examination questions to examining of examination papers to scope and depth of examination questions vis a vis the curricular expectation.

1.7.3 **Field Practice/Externship**

A compulsory six-month field practical training and two-week of rural posting shall be required of each student before completion of the course. This shall consist of periods of attachment to established veterinary practices (Government, Private), public and private farms, diagnostic and research laboratories, veterinary clinics and hospitals, abattoirs, veterinary control posts, zoological gardens, wildlife parks, fishponds, and Veterinary Field Stations. For the DVM programme, these attachments shall be made during the long vacations in the years before the final year of the course and the reports assessed on a pass or fail basis. These are discussed in greater detail in Section 2.

1.7.4 **Students' Evaluation of Courses**

There should be an established mechanism to enable students to evaluate courses delivered to them at the end of each semester. This should be an integral component of the course credit system to serve as an opportunity for feedback on the effectiveness of course delivery.

Such an evaluation which should be undertaken by students at the end of each course, should capture, among others:

- (i) Improvement in the effectiveness of course delivery.
- (ii) Continual update of lecture materials to incorporate emerging new concepts.
- (iii) Effective usage of teaching aids and tools to maximize impact of knowledge on students and
- (iv) Improvement in students' performance through effective delivery of tutorials, timely in presentation of continuous assessment and high quality examination.

It is very important that students' evaluation of courses be administered fairly and transparently through the use of well-designed questionnaires. The completed questionnaires should be professionally analysed and results discussed with the course lecturer(s) towards improvement in course delivery in all its ramifications.

1.7.5 Maintenance of Curricula Relevance

Using the benchmark as guide, the curriculum in each programme shall be reviewed from time to time to determine the continued relevance and fitness of purpose. The NUC, in its role as the national quality assurance agency on university programmes, shall subject the benchmark statements for review periodically. It is recommended that universities review their programme, at least once in five years, using the current quality assurance benchmark statements. Indeed, because veterinary medicine students normally take their 100 level courses in science, and some foundational courses in animal husbandry, it would be expedient if all courses in the University are reviewed at the same time.

A committee of staff senior enough and competent to carry out an effective review shall do each curriculum review. The review shall include an assessment as to whether the goals and objectives of the programme as formulated are still relevant in dynamic professional and social contexts.

Reviewers shall endeavour to incorporate the opinions of relevant stakeholders such as students, staff, external examiners, employers, professional bodies, policy makers etc. Each curriculum so revised shall be subjected to consideration and approval at the levels of Department, Faculty/Colleges, and Senate in the University. Specifically, a good review should examine the curriculum and resources in accordance with the following criteria:

- (i) Re-assessment or re-formulation of aims and objectives of the programme in relation to the needs of the learners and the market requirements taking into account the broader aspects of the discipline.
- (ii) The market demands of the graduates now and in the future, in terms of skills needed to function as competitive professionals in the current labour market on a global scale.
- (iii) Relevance of the current content in terms of knowledge, skills and attitudes being taught/developed and how these meet the needs of the present and future requirements of the clientele.

- (iv) How the teaching and learning methods meet or fall short of current and future standards of comparable programmes.
- (v) The quality of teaching and learning material used.
- (vi) Outcomes of learning in terms of success, experience of learners (pass rate, knowledge and skills acquisition, professional capability and integrity) as contributed by the programme.
- (vii) The views of employers and community members on the quality and relevance of the curriculum.

1.8 Resource Requirement

1.8.1 Personnel

a) Academic Staff

The NUC guidelines on staff/student ratio of 1:10 for Veterinary Medicine shall apply. However, there should be a minimum of six full-time equivalent of staff in a department. The proportion of academic staff with PhD should constitute not less than 70% of the teaching staff. All academic staff should be computer literate and continue to be productive in teaching and research.

Qualifications for Appointments/Promotion of Academic Staff

	LEVEL	QUALIFICATIONS
i.	Graduate Assistant	A good Bachelor's Degree (with a minimum Second Class Upper Division) This is a training position and complete their Master's degree within two years of their appointment.
ii.	Assistant Lecturer	A good Bachelor's Degree and Master's Degree.
iii.	Lecturer II	A Doctorate Degree in addition to a good Bachelor's degree Promotion from Assistant Lecturer grade after a minimum of three years.
iv.	Lecturer I	In addition to the qualifications specified for Lecturer II, Lecturer I should have had at least three years post-doctoral teaching experience and demonstrated ability for research work and evidence of scholarship.
v.	Senior Lecturer	Basic qualifications for Lecturer I plus at least three years of teaching experience. Must have demonstrated research capability through good academic publications.
vi.	Associate Professor (Reader)	Basic qualifications set out for Senior Lecturer plus at least three years of experience. Must have considerable publications resulting from research as well as demonstrated academic leadership ability. A Reader should have evidence of participation in University administration and community activities. External assessment is required for promotion to the level of an Associate Professor.
vii.	Professor	Basic qualifications as for Reader/Associate Professor. Must have had at least three years of experience as

		Associate Professor as well as some professional recognition. External assessment is required for promotion to the level of a Professor. A Professor should demonstrate clear evidence of scholarship through considerable academic publications.
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b) **Administrative Support Staff**

The services of the administrative support staff are indispensable in the proper administration of the departments and faculty offices. It is important to recruit very competent senior staff that are computer literate.

c) **Technical Support Personnel**

The services of technical support staff such as laboratory technologists, radiographers and veterinary nurses/superintendents, which are indispensable in the proper running of laboratories and clinics are required. It is important to recruit very competent senior technical staff to maintain teaching and research equipment. They are also to undergo regular training to keep them abreast of developments in equipment operation and maintenance.

1.8.2 **Physical Facilities**

a) **Spaces**

The NUC recommends the following physical space requirement:

	-	m ²
Professor's Office	-	18.50
Head of Department's Office	-	18.50
Tutorial Teaching Staff's Office	-	13.50
Other Teaching Staff Space	-	7.00
Technical Staff Space	-	7.00
Secretarial Space	-	7.00
Science Staff Research Laboratory	-	16.50
Veterinary Staff Research Laboratory	-	14.50
Seminar Space/per student	-	1.85
Clinics Space	-	3.60
Laboratory Space	-	7.50

b) **Equipment**

To achieve the benchmark statements for any programme, there should be:

- (i) A minimum number of identifiable laboratories for each programme which should be in accordance with the recommended space requirements and, in addition, be reasonably equipped.
- (ii) At least one large and reasonably equipped auditorium for teaching. It is important that equipment should be acquired in sufficient number to enable adequate implementation of the benchmark statements as they relate to pre-clinical, para-clinical and clinical phases of the programme.

1.8.3 **Library and Information Resources**

Each Faculty of Veterinary Medicine should have a separate Veterinary Faculty Library and separate reading rooms for pre-clinical, para-clinical and clinical students. The library should be well stocked with current books, manuals, journals, and other non-book collections. The library should also be equipped with computers with information retrieval through on-line search and with photocopying and book binding facilities.

The library and the reading rooms should have capacity to sit at least 30 per cent of all the veterinary students at any one time.

1.9 **General Studies**

Goal

To produce a well-rounded, morally and intellectually capable graduates with vision and entrepreneurial skills in an environment of peace and social cohesiveness.

Objectives

The objectives of the General Studies programme consist of the following:

- a) Acquisition, development and inculcation of the proper value-orientation for the survival of the individual and society.
- b) The development of intellectual capacities of individuals to understand, appreciate and promote peaceful co-existence.
- c) Production of graduates with broad knowledge of the Nigerian Nation and people with a view to inculcating in them mutual understanding and patriotism.
- d) Exposing graduates of Nigerian Universities to the rudiments of ICT for computer literacy and ability to live usefully in this ICT age.
- e) Preparing students for a post university life with opportunities for job creation and entrepreneurial skills.
- f) Production of graduates capable of communicating effectively (both oral and written).

SECTION TWO:

SYNOPSIS OF VETERINARY MEDICINE DEGREE PROGRAMME; GENERAL FOUNDATIONAL COURSES

2.1 Preamble

The curriculum for Doctor of Veterinary Medicine (DVM) is currently the only programme in Nigerian Universities that qualifies graduates to work as veterinary surgeons. The courses regarded as foundational to the degree programme are addressed in this section. They are basically those courses that serve to upgrade students' knowledge of basic sciences, those that equip veterinary students with adequate understanding of ecology, husbandry and management of several animal species and those that equip students with on-the-job practical/clinical experiences. In addition, some social science courses which could broaden students' knowledge of contemporary issues in the environment and society are required as foundational.

2.2 The Foundation Courses

The foundation courses are basically in five categories:

- ✚ Pre-Veterinary Courses in the Basic Sciences
- ✚ General Studies
- ✚ Entrepreneurship
- ✚ Animal Husbandry and Management
- ✚ Externship/Field Practice

2.2.1 Courses in Basic Sciences

The foundation courses in basic sciences are mainly Biology (Zoology), Physics and Chemistry. The number of units of these courses to be taken at the 100-Level is presented below.

Courses in Basic Sciences

Course	Course Codes	Total Units	Status
Biology	BIO 101, BIO 102, BIO 107, BIO 108	8	R
Chemistry	CHM 101, CHM102, CHM107, CHM108 CHM 105	8	R
Physics	PHY 101, PHY 102, PHY 107, PHY 108	8	R
TOTAL		24	

2.2.2 General Studies Programme

The aim of the General Studies Programme is to expose students to a course of liberal education through which they can develop and expand their awareness of their social, cultural and natural environments. The goal is to produce well-rounded graduates that are intellectually sound, competent in the use of English Language.

The objectives of the programme include:

- Acquisition of a body of situational relevant knowledge outside of the respective field of specialization of the students for productive, healthy living and promotion of peaceful coexistence.

- Development of competence in the use of English Language as a tool for their studies and effective means of communication in the society and in their future employment or enterprise.

Students are expected to register for at least 10 units of General Studies courses from among the courses listed below.

Courses in General Studies

Course Code	Course Title	Units
GST 111	Communication in English I	2
GST 112	Logic, Philosophy and Human Existence	2
GST 113	Nigerian Peoples and Culture	2
GST 121	Use of Library, Study Skills and ICT	2
GST 122	Communication in English II	2
GST 123	Basic Communication in French	2
GST 124	Basic Communication in Arabic	2
GST 125	Contemporary Health Issues	2
GST 211	Environment and Sustainable Development	2
GST 222	Peace and Conflict Resolution	2
GST 223	Introduction to Entrepreneurial Skills	2
GST 224	Leadership Skills	2
GST 311	Entrepreneurship Studies	2

2.2.3 Entrepreneurship

Towards Nigeria's quest for accelerated economic growth, it is important that active and virile youth population is assisted to develop and convert their innovative ideas into business ventures. These skills can be acquired particularly by those so innately inclined. This underscores the need to actively promote and train students to be entrepreneurial within our educational system. The course aims at re-orientating students towards a job-creation mindset rather than the fixed attitude of job-seeking. It will equip them with the skills required in establishing businesses or making them add value to existing systems, if employed in organizations. The main objective is to introduce students to concepts and opportunities available in entrepreneurship and innovation. It assumes no previous knowledge and takes students through the rudiments of entrepreneurship to selecting a desired business and starting it with a Feasibility Report.

The specific objectives of the GST 223 (Introduction to Entrepreneurship Skills) and GST 311 (Entrepreneurship Studies), also to be taught under the General Studies Programme as reflected in the above table, are to enable students to:

- Understand the relationship of enterprise, entrepreneur, business, entrepreneurship, innovation and creativity.
- Analyse the historical perspective of entrepreneurship in Nigeria, and relate it to the recent trend of unemployment, under-employment and job dissatisfaction, personal, national and global economic recession.
- Identify the roles of entrepreneurial development agencies and regulatory bodies.

- Cultivate the spirit of entrepreneurship.
- Correct wrong attitudes and mindsets and develop high entrepreneurial potential in student.
- Select possible business ideas.
- Build the capacity to develop business plan to start a business.

2.2.4 **Animal Husbandry and Management**

Since Veterinary Medicine is a biomedical science, the knowledge of the breeds, breeding and genetics, feeds and feeding, and the common environment on the farm and in the wild, housing and mode of animal management practices are thus foundational courses for veterinary medicine. As a result, the education of veterinary students should be presented in the form of animal health in the context of husbandry practices. Animal husbandry courses should be presented in their simple, clear and comprehensive terms. This is essentially to guarantee the health and safety of domestic animals and towards realization of Nigeria's quest for accelerated economic growth, food security and primary health care. It is important that active and virile youth population is assisted to develop and convert their innovative ideas into holistic animal health and productivity. From this background, the knowledge of healthcare can be effectively constructed and developed. This is why the domestic animal species rank first and foremost as the target of veterinary medicine, essentially to provide nutrition for man, healthy companion in the pets and health of the common environment.

2.2.5 **Externship/Field Practice**

An important aspect of the education and training of Veterinary doctors in the universities is organised exposure to some elements of field practice similar to the industrial attachment as articulated under the Students Industrial Work Experience Scheme (SIWES). This is being emphasized herein in view of the rather poor handling of Externship/Field Practice, in most existing colleges/faculties of Veterinary Medicine in the country.

A compulsory 24 weeks field practical training and two-week of rural posting shall be required of each student in the DVM programme before completion of the course. This shall consist of periods of attachment to established veterinary institutions (government, private), public and private farms, diagnostic and research laboratories, veterinary clinics and hospitals, abattoirs, veterinary control posts, zoological gardens, wildlife parks, fish ponds, and Veterinary Field Stations. These attachments shall be made during the long vacations and the reports assessed on a pass or fail basis.

A special feature of the Field Practice in Veterinary Medicine is the choice of each field practice which is based on students' level and training focus at each phase:

- ✚ Externship I: A field practice of 6 weeks during long vacation at the end of 200-Level session at livestock farms, fish ponds and zoological gardens where they perform animal husbandry services at the pre-clinical phase.
- ✚ Externship II: A field practice of 6 weeks during the long vacation at the end of the 300-Level at diagnostic laboratories at the para-clinical phase.
- ✚ Externship III: A field practice of 6 weeks during long vacation at the end of 400-Level session at veterinary clinics/hospitals at the clinical phase.

- ✚ Externship IV: A field practice of 6 weeks during the long vacation at the end of the 500-Level veterinary control posts and abattoirs at the clinical phase.
- ✚ Rural Posting in a veterinary field station in the final year.

It should be noted that Externship/Field Practice involves the following:

- Working successfully in a farm, zoological gardens, veterinary hospital or abattoir as the case may be for the specified period.
- Submitting of a Work Report to the Faculty for onward transmission to the Veterinary Council of Nigeria at the end of the training period.
- Presentation of seminar on the externship training experience.

2.2.6 Structure of the Foundation Courses

Presented below are the major courses that undergraduate veterinary students are expected to take. Though the bulk of foundation courses in veterinary medicine are taught at the 100-Level (Table 2.3), a few other foundation courses at higher levels are presented in Table 2.4. The Units of each course, the number of lecture hours (LH) and the practicals hours (PH), for those with practical component, have been indicated.

Structure of Foundation Courses at 100 Level

Course Code	Course Title	Units	Status	LH*	PH*
GST 111	Communication in English I	2	C*	30	-
GST 112	Logic, Philosophy and Human Existence	2	R	30	-
GST 113	Nigerian Peoples and Culture	2	R	30	-
GST 121	Use of Library, Study Skills and ICT	2	C	30	-
GST 122	Communication in English II	2	C	30	-
BIO 101	General Biology I	3	R	45	-
BIO 102	General Biology II	3	R	45	-
BIO 107	General Biology Practical I	1	R	-	45
BIO 108	General Biology Practical II	1	R	-	45
CHM 101	General Chemistry I	3	R	45	-
CHM 102	General Chemistry II	3	R	45	-
CHM 107	General Practical Chemistry I	1	R	-	45
CHM 108	General Practical Chemistry II	1	R	-	45
PHY 101	General Physics I	3	R	45	-
PHY 102	General Physics II	3	R	45	-
PHY 107	General Practical Physics I	1	R	-	45
PHY 108	General Practical Physics II	1	R	-	45
VMD 101	Introduction to Veterinary Medicine	1	R	15	-
	TOTAL UNITS	35			

C = Compulsory

E = Elective

R = Required

LH = Lecture Hours per semester

PH = Practical Hours per semester

Structure of Foundation Courses at 200 to 600 Levels

Course Code	Course Title	Units	Status	LH	PH
GST 123	Basic Communication in French	2	R	30	-
GST 125	Contemporary Health Issues	2	R	30	-
GST 211	Environmental and Sustainable Dev.	2	R	30	-
ANP 201	Animal Management I	2	C	15	45
ANP 202	Animal Management II	2	C	15	45
ANP 203	Poultry Production	3	R	30	45
EXT 299	Externship I (Animal Husbandry)	2	C	6 weeks	
GST223	Introduction to Entrepreneurship Skills	2	C	30	-
GST 224	Leadership Skills	2	R	30	-
GST 311	Entrepreneurship Studies	2	R	30	-
ANP 304	Monogastric Animal Nutrition	2	C	15	45
ANP 305	Ruminant Animal Nutrition	2	C	15	45
EXT 399	Externship II (Diagnostics)	2	C	6 weeks	
ANP 406	Animal Breeding and Genetics	2	C	15	45
ANP 407	Nigerian Feeds and Feeding Stuffs	2	C	15	45
ANP 408	Care of Companion Animals	2	C	15	45
EXT 499	Externship III (Clinics)	2	C	6 weeks	
EXT 599	Externship IV (Epidem. & Public Health)	2	C	6 weeks	
EXT 698	Rural Posting	1	C	2 weeks	
TOTAL UNITS		46			

2.2.7 Course Synopsis of the Foundation

Presented below are the synopsis of all the Foundational courses presented in Tables 2.1, 2.2 and 2.3. The Units of each course, the number of lecture hours (LH) and the number of practical hours (PH), for those with practical component, have been indicated.

100 Level Courses

Students take most of these courses from the Faculty of Science and also the General Studies and Entrepreneurial Unit, where the latter exists in a university.

GST 111 Communication in English I (2 Units; LH 30)

Effective communication and writing in English Language skills, essay writing skills (organization and logical presentation of ideas, grammar and style), comprehension, sentence construction, outlines and paragraphs.

GST 112 Logic, Philosophy and Human Existence (2 Units; LH 30)

A brief survey of the main branches of Philosophy; Symbolic logic; Special symbols in symbolic logic-conjunction, negation, affirmation, disjunction, equivalent and conditional statements, law of tort. The method of deduction using rules of inference and bi-conditionals, qualification theory. Types of discourse, nature or arguments, validity and soundness, techniques for evaluating arguments, distinction between inductive and deductive inferences; etc. (Illustrations will be taken from familiar texts, including literature materials, novels, law reports and newspaper publications).

GST 113 Nigerian Peoples and Culture (2 Units; LH 30)

Study of Nigerian history, culture and arts in pre-colonial times; Nigerian's perception of his world; Culture areas of Nigeria and their characteristics; Evolution of Nigeria as a political unit; Indigene/settler phenomenon; Concepts of trade; Economic self-reliance; Social justice; Individual and national development; Norms and values; Negative attitudes and conducts (cultism and related vices); Re-orientation of moral; Environmental problems.

GST 121 Use of Library, Study Skills and ICT (2 Units; LH 30)

Brief history of libraries; Library and education; University libraries and other types of libraries; Study skills (reference services); Types of library materials, using library resources including e-learning, e-materials, etc.; Understanding library catalogues (card, OPAC, etc.) and classification; Copyright and its implications; Database resources; Bibliographic citations and referencing. Development of modern ICT; Hardware technology; Software technology; Input devices; Storage devices; Output devices; Communication and internet services; Word processing skills (typing, etc.).

GST 122 Communication in English II (2 Units; LH 30)

Logical presentation of papers; Phonetics; Instruction on lexis; Art of public speaking and oral communication; Figures of speech; Précis; Report writing.

GST 123 Basic Communication in French (2 Units; LH 30)

Introduction to French, Alphabets and numeracy for effective communication (written and oral), Conjugation and simple sentence construction based on communication approach, Sentence construction, Comprehension and reading of simple texts.

GST 124 Basic Communication in Arabic (2 Units; LH 30)

Introduction to Arabic alphabets and writing systems. Elementary conversational drills. Basic reading skills and sentence construction in Arabic.

GST 125 Contemporary Health Issues (2 Units; LH 30)

Diet, exercise and health, nutritional deficiency diseases, malaria, other infections, hypertension, organ failure, air-borne diseases, sexually transmitted diseases, cancer and its prevention, sickle cell disease. HIV/AIDS: Introduction, epidemiology of HIV, natural history of HIV infection, transmission of predisposing factors to HIV, Impact of HIV/AIDS on the society, management of HIV infection, prevention of HIV. Drugs and Society: sources of drugs, classification of drugs, dosage forms and routes of drug administration, adverse drug reactions, drug abuse and misuse, rational drug use and irrational drug use. Human kinetics and health education: personal care and appearance, exercise and health, personality and relationship, health emotions, stress, mood modifiers, refusal to tobacco, alcohol and other psychoactive drugs.

BIO 101 General Biology I (3 Units; LH 45)

Cell structure and organization, functions of cellular organelles, diversity, characteristics and classification of living things, general reproduction, interrelationship of organisms; heredity and evolution, elements of ecology and types of habitat.

BIO 102 General Biology II (3 Units; LH 45)

A generalized survey of the plant and animal kingdoms based mainly on study of similarities and differences in the external features, ecological adaptation of these forms.

BIO 107 General Biology Practical I (1 Unit; PH 45)

Laboratory experiments designed to illustrate the topics covered in BIO 101

BIO 108 General Biology Practical II (1 Unit; PH 45)

Experiments designed to emphasize the practical aspects of topics of course BIO 102

CHM 101 General Chemistry I (3 Units; LH 45)

Atoms, molecules and chemical reactions. Modern electronic theory of atoms. Electronic configuration, periodicity and building up of the periodic table. Hybridisation and shapes of simple molecules. Valence Forces; Structure of solids. Chemical equations and stoichiometry; Chemical bonding and intermolecular forces, kinetic theory of matter. Elementary thermochemistry; rates of reaction, equilibrium and thermodynamics. Acids, bases and salts. Properties of gases. Redox reactions and introduction to electrochemistry. Radioactivity.

CHM 102 General Chemistry II (3 Units; LH 45)

Historical survey of the development and importance of Organic Chemistry; Electronic theory in organic chemistry. Isolation and purification of organic compounds. Determination of structures of organic compounds including qualitative and quantitative analysis in organic chemistry. Nomenclature and functional group classes of organic compounds. Introductory reaction mechanism and kinetics. Stereochemistry. The chemistry of alkanes, alkenes, alkynes, alcohols, ethers, amines, alkyl halides, nitriles, aldehydes, ketones, carboxylic acids and derivatives. The Chemistry of selected metals and non-metals. Comparative chemistry of groups IA, IIA and IVA elements. Introduction to transition metal chemistry.

CHM 107 General Practical Chemistry I (1 Unit; PH 45)

Laboratory experiments designed to reflect the topics taught in CHM 101 and CHM 102 such as qualitative and quantitative chemical analysis, acid-base titrations. Gravimetric analysis. Calculation, data analysis and presentation. Functional group analysis.

CHM 108 General Practical Chemistry II (1 Unit; PH 45)

Continuation of laboratory experiments designed to reflect the topics taught in CHM 101 and CHM 102. Some of the experiments will have been carried out in CHM 107.

**PHY 101 General Physics I (3 Units; LH 45)
(Mechanics, Thermal Physics and Waves)**

Space and Time, Units and Dimension, Kinematics; Fundamental Laws of Mechanics, statics and dynamics; work and energy; Conservation laws. Moments and energy of rotation; simple harmonic motion; motion of simple systems; Elasticity; Hooke's law, Young's shear and bulk moduli, Hydrostatics; Pressure; buoyance, Archimedes' Principles; Surface tension; adhesion, cohesion, capillarity, drops and bubbles; Temperature; heat; gas laws; laws of thermodynamics; kinetic theory of gases; Sound. Types and properties of waves as applied to sound and light energies. Superposition

of waves. Propagation of sound in gases, solids and liquids and their properties. The unified spectra analysis of waves. Applications.

PHY 102 General Physics II (3 Units; LH 45)
(Electricity, Magnetism and Modern Physics)

Electrostatics; conductors and currents; dielectrics; magnetic fields and electromagnetic induction; Maxwell's equations; electromagnetic oscillations and waves; Coulomb's law; methods of charging; Ohm's law and analysis of DC circuits; AC voltages applied to Inductors, capacitors and resistance; Applications.

PHY 107 General Practical Physics I (1 Unit; PH 45)

This introductory course emphasizes quantitative measurements, the treatment of measurement errors, and graphical analysis. A variety of experimental techniques will be employed. The experiments include studies of meters, the oscilloscope, mechanical systems, electrical and mechanical resonant systems, light, heat, viscosity, etc., covered in PHY 101 and PHY 102. However, emphasis should be placed on the basic physical techniques for observation, measurements, data collection, analysis and deduction.

PHY 108 General Practical Physics II (1 Unit; PH 45)

This is a continuation of the experiments designed for PHY 101 and PHY 102 some of which have been covered under PHY 107.

VMD 111 Introduction to Veterinary Medicine (1 Unit 1; LH 15)

A faculty orientation course which is taught by lecturers nominated by Head of each department in the faculty. Topics include; the global and national history of Veterinary Medicine. Organization of Veterinary Services in Nigeria, Employment opportunities for veterinarians. Teaching activities of each department.

200 to 600 level Courses

There are still some foundational courses at the 200-600 levels. These courses are listed below.

GST 211 Environment and Sustainable Development (2 Units; LH 30)

Man – his origin and nature; Man and his cosmic environment; Scientific methodology, Science and technology in the society and service of man. Renewable and non-renewable resources – man and his energy resources. Environmental effects of chemical plastics, Textiles, Wastes and other materials, Chemical and radiochemical hazards, Introduction to the various areas of science and technology. Elements of environmental studies.

GST 212 Logic, Philosophy and Human Existence (2 Units; LH 30)

A brief survey of the main branches of Philosophy; Symbolic logic; Special symbols in symbolic logic-conjunction, negation, affirmation, disjunction, equivalent and conditional statements, law of tort. The method of deduction using rules of inference and bi-conditionals, qualification theory. Types of discourse, nature or arguments, validity and soundness, techniques for evaluating arguments, distinction between inductive and deductive inferences; etc. (Illustrations will be taken from familiar texts, including literature materials, novels, law reports and newspaper publications).

GST 222 Peace Studies and Conflict Resolution (2 Units; LH 30)

Basic Concepts in peace studies and conflict resolution; Peace as vehicle of unity and development; Conflict issues; Types of conflict, e. g. Ethnic/religious/political/economic conflicts; Root causes of conflicts and violence in Africa; Indigene/settler phenomenon; Peace – building; Management of conflict and security. Elements of peace studies and conflict resolution; Developing a culture of peace; Peace mediation and peace-keeping; Alternative Dispute Resolution (ADR). Dialogue/arbitration in conflict resolution; Role of international organizations in conflict resolution, e.g. ECOWAS, African Union, United Nations, etc.

GST 223 Introduction to Entrepreneurship (2 Units; LH 45)

Introductory Entrepreneurial skills: Relevant Concepts: Enterprise, Entrepreneur, Entrepreneurship, Business, Innovation, Creativity, Enterprising and Entrepreneurial Attitude and Behaviour. History of Entrepreneurship in Nigeria. Rationale for Entrepreneurship, Creativity and Innovation for Entrepreneurs. Leadership and Entrepreneurial Skills for coping with challenge. Unit Operations and Time Management. Creativity and Innovation for Self-employment in Nigeria. Overcoming Job Creation Challenges. Opportunities for Entrepreneurship, Forms of Businesses, Staffing, Marketing and the New Enterprise. Feasibility Studies and Starting a New Business. Determining Capital Requirement and Raising Capital. Financial Planning and Management. Legal Issues, Insurance and Environmental Considerations.

GST 224 Leadership Skills (2 Units; LH 30)

Transformation is a fundamental shift in the deep orientation of a person, organization or society such that the world is seen in new ways and new actions and results become possible that were impossible prior to the transformation. Transformation happens at the individual level but must be embedded in collective practices and norms for the transformation to be sustained. Leadership Development Programme (LDP) proposes novel approaches to teaching and learning, which emphasizes the practical involvement of participants. It is interactive and involves exercises and actual implementation of breakthrough projects by teams that make difference in the lives of the target population. In this course, leadership concepts comprising of listening, conversation, emotional intelligence, breakthrough initiatives, gender and leadership, coaching and leadership, enrollment conversation and forming and leading teams will be taught

GST 311 Entrepreneurship Studies (2 Units; LH 30)

Profiles of business ventures in the various business sectors such as: Soap/Detergent, Tooth brush and Tooth paste making; Photography; Brick making; Rope making; Brewing; Glassware production/ Ceramic production, Paper production; Water treatment/ conditioning/ packaging; Food processing/preservation/ packaging; Metal fabrication; Tanning industry; Vegetable oil extraction; Farming; Fisheries/aquaculture; Plastic making; Refrigeration/Air-conditioning; Carving, Weaving; Bakery; Tailoring; Printing; Carpentry; Interior Decoration; Animal husbandry etc. Case Study Methodology applied to the development and administration of Cases that bring out key issues of business environment, start-up, pains and gains of growth of businesses, etc. with particular reference to Nigerian businesses. Experience sharing by business actors in the economy with students during Case presentations.

Externship (Field Practice)

EXT 299 Externship I (Animal Husbandry) (2Units; 6weeks)

A long vacation field practice of six weeks duration in a farm. Inspection visits may be conducted to such places by the staff of relevant departments to assess students participation.

EXT 399 Externship II (Diagnostics) (2 Units; 6 weeks)

A long vacation field practice of six weeks duration in diagnostic laboratories during the long vacation following 300 level. Inspection visits may be conducted to such places by lecturers from the coordinating departments to assess student's participation.

EXT499 Externship IV (Clinics) (2 Units; 6 weeks)

A long vacation field practice of six weeks duration in Clinics and Veterinary Hospitals during the long vacation following 500 level. Inspection visits may be conducted to such places by the coordinating departments to assess student's participation.

EXT599 Externship III (Epidemiology and Public Health) (2 Units; 6 weeks)

A long vacation field practice of six weeks duration in an abattoir and control posts during the long vacation following 400 level. Inspection visits may be conducted to such places by lecturers from the coordinating departments.

EXT 698 Rural Posting (1 Unit; 2 weeks)

A two-week posting of students to serve in a rural area starting from the last two weeks of the long vacation after the 500 level. Students will be involved in rural veterinary practice and extension services. Student's participation and report is to be assessed by lecturers from the Department of Veterinary Public Health and other clinical departments.

Animal Production and Management

ANP201 Animal Management I (2 Units; LH 15 PH 45)

Introduction to livestock husbandry, species, breeds and distribution. Animal behaviour. Livestock production systems; extensive, semi-intensive, intensive. Estimation of liveweight and age. Emphasis on birth weight, litter size, weaning age/weight, growth rate. Disbudding, dry hoof trimming. Tagging and branding. Grooming of companion animals.

ANP 202 Animal Management II (2 Units; LH 15 PH 45)

Animal Welfare, nomadism, pasture management, animal housing, hatchery management, husbandry of camels, horses, buffaloes. Restraint techniques and animal handling, feeds of companion animals, kennel and stable management. Animal transportation.

ANP 203 Poultry Production (3 Units; LH 30 PH 45)

History of the domestic fowl. Types and breeds of poultry birds. Special husbandry (housing and feeding) requirements of broilers, layers, breeders and cockerels. Special requirements of turkey, guinea fowls, ducks, ostrich and quail.

ANP 304 Monogastric Animal Nutrition (2Units;LH 15 PH 45)

Principles of monogastric nutrition. Nutrient requirements for various classes and species of non-ruminant animals. Dietary allowance, food surveys, food balance sheets; feeding standards; nutrient requirements for the various classes of animals, feed additives. Water in relation to nutrition. Water metabolic computation and ration formulation. Feed evaluation. Feed mixing and feed manufacture on large scale. The feed industry. Nutritional/metabolic disorders in non-ruminant animals.

ANP 305 Ruminant Animal Nutrition (2 Units;LH 15 PH 45)

The nature of ruminant stomach reviewed. Microbiology of rumen; physiology and biochemistry of rumen. Utilization of roughages in ruminant feeding. Metabolic processes and pathways; Non-protein nitrogen utilization; Determination of digestion coefficients, balance trials; systems for energy evaluation, scheme for protein values; water in relation to nutrition and water metabolism; requirements and their inter-relationship in nutrition; Feed additives, proximate analysis; ration formulation, non-protein nitrogen utilization, nutrient partition, nutritional disorders. Use of agro-industrial by-products in ruminant feeding.

ANP 406 Animal Breeding and Genetics (2 Units; LH 15 PH 45)

Variance, co-variances, partitioning of phenotypic variance. Genotype by environment interaction; Statistical tools for studying inheritance; Estimation of genetic parameters (heritability, repeatability, genetic correlations); In breeding, line breeding and relationship, cross-breeding in practice, selection principles and methods; breeding (mating) systems; breeding plans for different farm animal species; foundation stock development. Genetic improvement for various livestock traits.

ANP 407 Nigerian Feeds and Feeding Stuffs (2 Units; LH 15 PH 45)

Survey of Nigerian feeds and feeding stuffs. Classification of feeds, feeding stuffs and feed supplements into roots, tubers, cereals, legumes, roughages, etc. Chemistry, processing and nutritive values of livestock feeding stuffs, their storage, quality control and evaluation of feeding stuffs and feeds. Feeding standard and ration formulation. Concentrate feeds, cereals, legumes and oil seeds. Chemistry and nutritive values of some Nigerian grasses and legume species.

ANP 408 Care of Companion Animals (2 Units; LH 15 PH 45)

Uses of horses, camels and donkeys. Feeds and feeding. Basic tools in horse groomy. Care of horse stables. Care of the hoof. Types of dogs. Uses of dogs. Feeds and feeding of dogs. Bathing tips, tooth care. Basic training of puppies and adult dogs.

SECTION THREE:

COURSE STRUCTURE AND SYNOPSES OF VETERINARY MEDICINE

3.1 Preamble

This Section is devoted to the presentation of the structure and the synopses of the professional courses prescribed for the Doctor of Veterinary Medicine (DVM) degree programme. The courses are mainly at the levels 200 to 600. In the presentation, compulsory courses (C), required courses (R) and electives (E) have been identified.

3.2 Doctor of Veterinary Medicine Degree Programme

The core professional courses of the DVM programme are designed to prepare students for three main areas of emphasis, namely pre-clinical, para-clinical and clinical courses that satisfy students' learning objectives. The pre-clinical courses at 200 and 300 levels are meant to prepare students for knowledge of normal body forms and functions in domestic and non-domestic animals beginning at the molecular and cellular levels to whole organism. The para-clinical courses at the 300 and 400 levels should prepare students for ability to apply central biological principles and mechanisms that underlie animal health and disease manifestations at organism and population levels in a diverse global society. The clinical courses at the 500 and 600 levels are to equip students with the ability to use problem solving skills to analyse a patient, synthesize a diagnosis, use medical and surgical skills for case management, prevent diseases, institute biosecurity measures, identify zoonotic diseases and food safety issues and to promote awareness of the public. In all, the professional stage is used to train students on comprehensive treatment plan and patient referral when indicated.

3.2.1 Structure of the Veterinary Medicine Courses

The Professional Veterinary Courses

The professional courses are basically in three categories, designated as Phase I-III:

Phase I (Pre-Clinical Courses): Comprising Veterinary Anatomy (Microscopic, Developmental, Gross and Comparative), Veterinary Physiology, Biochemistry and Molecular Biology, Animal Management and Production.

Phase II (Para-Clinical Courses): Comprising Veterinary Pathology, Veterinary Parasitology, Entomology, Microbiology, Immunology, Pharmacology and Toxicology, Veterinary Integrative Learning through Field Practical Experience and Computer Appreciation.

Phase III (Clinical Courses): Comprising Veterinary Medicine, Veterinary Surgery, Veterinary Theriogenology (Obstetrics, Mastitis and Udder Management), Veterinary Public Health: Food (Meat and Milk) Hygiene, Zoonoses and Environmental Health, Preventive Medicine (Epidemiology, Disease Prevention Techniques, Veterinary Economics and Business Management, Veterinary Ethics, Jurisprudence and Extension, Computer Applications and Clinical Rotations in these areas.

Every graduating student should be allowed to carry out research project in his/her area of interest which may be in any one of the three phases of the programme. The project will be supervised by a lecturer and the student will defend the findings before

a Departmental Panel. Improved scientific writing and communication can be achieved through this exercise.

Presented below in Tables 3.1 to 3.5 are the major courses that undergraduate veterinary students are expected to take in the last five years of study (200-600 Levels).

Structure of the DVM200 Level Courses

Course Code	Course Title	Units	Status	LH	PH
VAN 213	Gross Veterinary Anatomy	4	C	30	90
VAN 214	Histology	4	C	30	90
VPY 212	Veterinary Physiology I	3	C	30	45
VPY 213	Veterinary Physiology II	3	C	30	45
VPY 214	Introductory Molecular Biology	2	R	30	-
VBC 211	Biochemistry I	3	C	30	45
VBC 212	Biochemistry II	3	C	30	45
ANP 201	Animal Management I	2	C	15	45
ANP 202	Animal Management II	2	C	15	45
ANP 203	Poultry Production	3	C	30	45
GST 123	Basic Communication in French	2	R	30	-
GST 125	Contemporary Health Issues	2	R	30	-
EXT 299	Externship I	2	C	6 weeks	
TOTAL UNITS		35			

LH = Lecture Contact Hours, PH = Practical Contact Hours.

Structure of the DVM 300 Level Courses

Course Code	Course Title	Units	Status	LH	PH
VAN 315	Embryology	4	C	30	90
VAN 316	Comparative Gross Anatomy	3	C	30	90
VPY 315	Environmental Physiology	4	C	30	90
VPY 316	Reproduction and Endocrinology	2	C	15	45
VBC 313	Biochemistry III	3	C	30	90
VPC 311	General Pharmacology	2	C	30	-
VPE 301	Introductory Parasitology	3	C	30	45
VMB 301	General Microbiology	3	C	30	45
VMB 303	Immunology	1	C	15	-
VPT 301	General Pathology	3	C	30	45
AVM 301	Fish Husbandry and Management	2	C	15	45
ANP 304	Monogastric Animal Nutrition	2	C	15	45
ANP 305	Ruminant Animal Nutrition	2	C	15	45
GST 223	Introduction to Entrepreneurial Skills	2	R	30	-
GST 224	Leadership Skills	2	R	30	-
EXT 399	Externship II	2	C	6 weeks	
TOTAL UNITS		40			

Structure of the DVM 400 Level Courses

Course Code	Course Title	Units	Status	LH	PH
VPC 413	Systemic Pharmacology	3	C	30	45
VPC 414	Chemotherapy	2	C	15	45
VPC 415	Toxicology	2	C	15	45
VPE 403	Protozoology	2	C	15	45
VPE 404	Helminthology	3	C	30	45
VPE 405	Entomology	2	C	15	45
VMB 404	Pathogenic Bacteriology	3	C	30	45
VMB 405	Virology and Mycology	3	C	30	45
VPT 403	Systemic Pathology	4	C	30	90
VPH 402	Biostatistics	2	C	30	-
VSR 402	Introductory Surgery	2	C	15	45
VSR 404	Anaesthesiology and Intensive care	2	C	15	45
VMD 401	Introductory Medicine	2	C	15	45
VPM 401	Veterinary Extension and Rural Sociology	2	C	30	-
ANP 406	Animal Breeding and Genetics	3	C	30	45
ANP 407	Nigerian Feeds and Feeding Stuffs	2	C	15	45
GST 311	Entrepreneurship Studies	2	R	30	-
EXT 499	ExternshipIII	2	C	6 weeks	
TOTAL UNITS		43			

Structure of the DVM 500 Level Courses

Course Code	Course Title	Units	Status	LH	PH
VAN 517	Applied Anatomy	1	C	-	45
VPT 504	Clinical Pathology	3	C	30	45
VPH 514	Food and Meat Hygiene and Inspection	2	C	30	-
VPH 515	Zoonoses and Environmental Health	1	C	15	-
VPM 502	Epidemiology & Principles of Disease Prevention	2	C	30	-
VPM 505	Veterinary Jurisprudence and Ethics	2	C	30	-
VPM 506	Veterinary Economics & Business Management	1	C	15	-
VMD 515	Avian Medicine	3	C	45	-
VMD 516	Small & Laboratory Animal medicine	2	C	30	-
VMD 517	Ruminant Medicine	2	C	30	-
VMD 518	Porcine Medicine	2	C	30	-
VMD 619	Equine Medicine	2	C	30	-
VSR 506	Diagnostic Imaging	3	C	30	45
VSR 506	Soft Tissue Surgery	2	C	30	-
VSR 508	Orthopaedic Surgery	2	C	30	-
VTG 501	Obstetrics and Reproductive Disorder	4	C	60	-
VTG 502	Andrology and Artificial	2	C	30	-

	Insemination				
AVM 513	Diseases of Aquatic Animals	2	C	30	-
EXT 599	ExternshipIV	2	C	6 weeks	
TOTAL UNITS		40	-		

Structure of the DVM 600 Level Courses

Course Code	Course Title	Units	Status	LH	PH
VMD 606	Equine Medicine	2	C	30	-
VSR 609	Equine Lameness	2	C	30	-
VPM 608	Computer Application in Veterinary Practice	2	C	15	45
AVM 614	Wildlife Ecology and Diseases	3	C	45	-
VPC 616	Veterinary Pharmacy	1	C	15	-
VCH 603	Clinics I	15	C	-	675
VCH 604	Clinics II	15	C	-	675
VCH 605	Clinical Seminar	1	C	-	45
VCH 606	Research Project	4	C	-	180
EXT 698	Rural Posting	1	C	2 weeks	
TOTAL UNITS		46			

3.2.2 Course Descriptions

Veterinary Anatomy (23 Units)

VAN 201 Basic Veterinary Anatomy (4 Units; LH 30PH 90)

Basic gross anatomy of the animal body, the skeletal system, respiratory, digestive, reproductive, circulatory and lymphatic systems of a type animal. Comparative anatomy of internal organs.

VAN 202 Basic Histology and Developmental Anatomy (4 Units; LH 30PH 90)

Histology of the muscular, connective tissues. Embryonic development of the mammal.

VAN 213 Gross Veterinary Anatomy (4 Units; LH 30PH 90)

Definition and terms, Anatomic Variation, General Osteology, musculoskeletal systems of the domestic animals.

VAN 214 Histology (4 Units; LH 30 PH 90)

Introduction to microscopy and microscopic techniques –the cell, the epithelial tissue, glandular tissue, the connective tissue, the muscular tissue, the nervous tissue. Systemic Histology: Microscopic study of the organ systems of the Body of domestic animals. Comparative Histology: The comparative histology of the organ systems of domestic animals.

VAN 315 Embryology (4 Units; LH 30 PH 90)

Normal development of mammalian and avian organ systems. Cell/Radiation Biology – Ultrastructure and functions of cellular components and their relationship to energy transport, movement and growth.

VAN 316 Comparative Gross Anatomy (2 Units; LH 15PH 45)

General and Comparative studies of the digestive, respiratory, circulatory systems of Domestic Animals: General and Comparative studies of the nervous, urogenital, endocrine, sense organs and integument of the domestic animals.

VAN 517 Clinical Anatomy (1 Unit; LH&PH 45)

Application of Radiography in the study of normal bones of domestic animals. Applied Anatomy – Topographic consideration of structures of domestic animals often involved in surgery and medical practice. A review of anatomy of relevant to meat inspection such as the lymph nodes and internal organs.

Veterinary Physiology (18 Units)

VPY 201 Basic Veterinary Physiology (4 Units; LH 30PH 90)

Blood and the circulatory system. Digestion, respiration, reproduction in males and females. Pregnancy,

VPY 212 Veterinary Physiology I (3 Units; LH 30 PH 45)

Definition of terms, body fluids and basic homeokinetic processes. Physiological control systems and feedback mechanisms.

VPY 213 Veterinary Physiology II (3 Units; LH 30 PH 45)

Fine structure of skeletal muscle and mechanism of muscular contraction, spinal cord and brain stem functions. Autonomic nervous system. Hypothalamus and limbic systems. Sleep and wakefulness. The eye and vision. Taste, smell and hearing.

VPY 214 Introductory Molecular Biology (2 Units; LH 15 PH 45)

A sub-cellular and molecular basis of cell function and mode by which cells multiply replicate and pass genetic information including DNA structure and protein synthesis. It also introduces methods of gene splicing and genetic engineering.

VPY 315 Environmental Physiology (4 Units; LH 30 PH 90)

Physiologic response to heat and cold. Temperature regulation: body temperature. Function of renal system. Micturition, unit, structure and general physiology of skin. Water, electrolyte and acid base balance.

VPY 316 Reproduction and Endocrinology (2 Units; LH 15 PH 45)

Endocrine organs and their secretions. Characteristics and mode of action of hormones. Functions of male and female reproductive systems. The role of reproductive hormones in reproductive functions. Oestrus cycle, puberty and lactation.

Veterinary Biochemistry (9 Units)

VBC 211 Biochemistry I (3 Units; LH 30, PH 45)

Biochemistry of protein, fats, oils and Carbohydrates.

VBC 212 Biochemistry II (3 Units; LH 30, PH 45)

Chemistry and biochemistry of lipid, Introduction to molecular biology, nutritional biochemistry of animals.

VBC 313 Biochemistry III (3 Units; LH 30 PH 45)

Rumen biochemistry. Lactation Biochemistry.

Veterinary Pharmacology and Therapeutics (12 Units)

VPC 301 General Pharmacology (2 Units; LH 30)

Introduction and historical development of Pharmacology. Sources and formulations of drugs. Mode of drug administration, absorption, distribution, biotransformation and excretion of drugs. Mechanisms of drug action.

VPC 402 Basic Pharmacology (2 Units; LH 15PH 45)

Groups of chemotherapeutic drugs, dosages, routes of administration, labeling and packages. Prescription interpretation and dispensing. The concept of drug misuse and abuse.

VPC 413 Systemic Pharmacology (3 Units; LH 30PH 45)

Agents affecting organ systems and their use in controlling central, peripheral and autonomic nervous systems, cardiovascular and respiratory, kidney and body homeostasis, reproductive system. Vitamins, minerals and hormones influencing metabolism, body growth and locally acting drugs.

VPC 414 Chemotherapy (2 Units; LH 15PH 45)

History and development of modern chemotherapy. Use and misuse of chemotherapeutic agents in disease control. Drugs tolerance. Drug resistance and hypersensitivity. Local and Systemic anti-infective agents.

VPC 415 Toxicology (2 Units; LH 15 PH 45)

General principles of toxicity and toxicological evaluation. Pesticides use and misuse. Heavy metal and chemical poisoning. Teratogenic toxicity. Poisonous plants. Mycotoxins. Animal venoms. Environmental toxicology including persistent organic pollutants. Study of diagnostic methods in poisoning, intervention-antidotes and prevention.

VPC 616 Veterinary Pharmacy (1 Unit; PH 15)

The rational use and choice of drug therapy in any specific treatment, Drug formulation and incompatibilities. Iatrogenic factors in clinical pharmacology. Prevention of drug toxicities.

Veterinary Microbiology (13 Units)

VMB 301 General Microbiology (3 Units; LH 30PH 45)

Introduction of Microbiology. Classification of microorganisms. Important bacteria, viruses, fungi of veterinary importance.

VMB 302 General Microbiology (3 Units; LH 30PH 45)

History of Microbiology of organisms, physiology and biochemistry of organisms, bacteriological techniques and methods. Sterilization and Disinfection. Antibiotics Taxonomy and Nomenclature of organisms. Environmental bacteriology.

VMB 303 Immunology (1 Unit; LH 15)

Historical perspectives. Anatomy and histology of Immunological organs, macrophages, lymphocytes and plasma cells. Immune responses. Antibody–Antigen reaction. Principles of Immunotherapy. Vaccines. Immunization and Immunological aspects of cancer.

VMB 404 Pathogenic Bacteriology (3 Units; LH 30PH 45)

General characteristics, growth requirements, resistance pathogenicity, immunity, diagnosis and public health significance of animal pathogens.

VMB 405 Virology and Mycology (3 Units; LH 30PH 45)

Structure, characteristics and classification of viruses. Pathogenesis, Immunity and transmission of viruses. Mycology, Rickettsia and Related organisms, mycoplasma and related organisms as above.

Veterinary Parasitology (12 Units)

VPE 301 General Veterinary Parasitology (2 Units; LH 15,PH 45)

Definitions, classification and economic importance of parasites of domestic animals. Specific parasites of the gastro intestinal tract. Respiratory system. Insects of veterinary importance. Vectors and vector-borne diseases.

VPE 302 Basic Parasitology (3 Units; LH 30,PH 45)

Productions identification, biology and life cycle of vectors. Helminthes of veterinary importance, The structure, classification, life cycle and transmission of Protozoan and other tick-borne parasites of domestic stock.

VPE 403 Protozoology (2 Units; LH 15 PH 45)

Method of diagnosis, treatment and control of important protozoan and Rickettsial diseases of domestic livestock in Nigeria.

VPE 404 Helminthology (3 Units; LH 30PH 45)

The study of morphology, classification and life cycle of helminths of veterinary medical importance. Laboratory egg counting techniques, larval culture, worm recovery and preservation.

VPE 405 Entomology (2 Units; LH 15 PH 45)

Vectors, binomial system of nomenclature, ecology and role in disease transmission, distribution (local and world wide), population dynamics insecticide and insecticide resistance, veterinary/medical importance and control.

Veterinary Pathology (13 Units)

VPT 301 General Pathology

(3 Units; LH 30PH 45)

History of Pathology. Degeneration and necrosis, circulatory disturbances. Inflammations and repair. Disturbances of growth. Neoplasia. Fundamental Immunopathology.

VPT 402 Basic Animal Pathology

(3 Units; LH 30PH 90)

Gross and histopathological lesions on body systems and organs of the animal body.

VPT 403 Systemic Pathology

(4 Units; LH 30PH 90)

Functional and tissue changes in the systems on basis of gross and histopathologic lesions associated with specific aetiologic agents and their tumors.

VPT 504 Clinical Pathology

(3 Units; LH 30PH 45)

Haematology and blood Chemistry, urinalysis, organ function tests, body fluids analysis, diagnostic cytology.

Veterinary Medicine (21 Units)

VMD 401 Introductory Medicine

(2 Units; LH 30 PH 45)

Use of common diagnostic instruments. Diagnostic methods for detection and differentiation of diseases according to systems. General systemic states. Vital signs and values.

VMD 402 Clinical Management

(3 Units; LH 15PH 90)

The set up of the Veterinary Clinic/hospital, client reception and basic facilities. Inpatient and outpatient management procedure. Clinic equipment for small and large animals. Cleaning and sterilization of hospital equipment. Examination of sick animals. Collection, preservation of specimen for sick animals.

VMD 515 Avian Medicine

(3 Units; LH 30)

Lectures on infectious (bacterial, viral, fungal, rickettsiaetc), metabolic and nutritional diseases of poultry. Emphasis would be placed on the clinical signs, diagnosis, treatment and control.

VMD 516 Small and Laboratory Animal Medicine

(2 Units; LH 30)

Lectures on infectious (bacterial, viral, fungal, rickettsiaetc), metabolic and nutritional diseases of dogs, cats, rabbits, guinea pigs and other experimental animals. Emphasis would be placed on the clinical signs, diagnosis, treatment and control.

VMD 517 Ruminant Medicine

(2 Units; LH 30)

Lectures on infectious (bacterial, viral, fungal, rickettsiaetc), metabolic and nutritional diseases of cattle, buffalo, sheep and goats. Emphasis would be placed on the clinical signs, diagnosis, treatment and control.

VMD 518 Porcine Medicine

(2 Units; LH 30)

Lectures on infectious (bacterial, viral, fungal, rickettsiaetc), metabolic and nutritional diseases of pigs. Emphasis would be placed on the clinical signs, diagnosis, treatment and control.

VMD 619 Equine Medicine (2 Units; LH 30)

Lectures on infectious, non-infectious including metabolic and nutritional diseases of equidae with particular reference to horses used for polo and security patrols of the mounted troops. Emphasis would be placed on the clinical signs, diagnosis, treatment and control of specific diseases of economic importance in the tropics. This course highlights the problem oriented approach in the management of equine diseases and disorders.

Veterinary Surgery (19 Units)

VSR 301 Wound Management (2 Unit; LH 15 PH45)

Signs and symptoms of wounds. Types of wound. Wound dressing and treatment. Uses of honey in wound treatment. Cancer, causes of cancer. Carcinogens. Treatment of cancer.

VSR 402 Introductory Surgery (2 Units; LH 15 PH45)

Surgical Preparation and Instrumentation. Pre-and Post-operative management. Suture materials, patterns and wound management. Bandage management.

VSR 403 Basic Radiology (2 Units; LH 15 PH45)

Definitions. Uses of radiology, Instrumentation in radiology. Preparing patients for x-ray and positioning. Exposure and developing techniques. Exposure to ultrasonography, fluoroscopy, scintigraphy. Safety and techniques in radiology.

VSR 404 Anaesthesiology and Intensive care (2 Units; LH 15 PH 45)

General principles of anaesthesia, mode of administration, effect on operational procedure, complications and management of general anaesthesia.

VSR 506 Diagnostic Imaging (3 Units; LH 30PH 45)

Introduction, Introduction of X-rays, Radiation safety, X-ray film exposure and processing, Radiographic interpretation, Radiation therapy, Principles of ultrasound scanning, Applications of scanning in veterinary medicine, Echocardiography, Principles of Computed Tomography (CT Scan). The uses of diagnostic imaging techniques in pregnancy diagnosis and in reproductive disorders. Review of Clinical imaging cases.

VSR 507 Soft Tissue Surgery (2 Units; LH 30)

Head, neck and thorax, abdominal, limbs and cosmetic surgery, lameness.

VSR 508 Orthopaedic Surgery (2 Units; LH 30)

Fractures and fracture healing, orthopaedic examination of the patient, reduction and fixation of fractures, orthopaedic nursing, diagnosis and treatment of fractures of long bones, pelvis, spine and skull of animal species. Management of infections, nutritional and neoplastic bone diseases, joint diseases.

VSR 609 Equine Lameness (2 Units; LH 30)

Causes of lameness, diagnosis and treatment of lameness in horses.

Theriogenology (9 Units)

VTG 501 Obstetrics and Neonatal Nursing (3 Units; LH 30PH 45)

Pregnancy in cow, mare, ewe, doe, sow, bitch and queen. Parturition in different animal species. Management of distocia. Care of the new born in cattle, horses, pigs, dogs.

VTG 512 Obstetrics and Reproductive Disorders (4 Units; LH 45PH 45)

Cow, Mare, Ewe, Doe, Sow, Bitch, Queen, Pregnancy diagnosis and Differential Diagnosis. Prediction of estrus. Mating behaviours. Breeding soundness Evaluation. Clinical Examination – Male and Female. Obstetrics, Infertility and Neonatal Disease: Physiology of gestation, parturition, obstetrical manipulations, disturbances in estrus, conception and gestation, causes, treatment, prevention of infertility. Foetal Abnormalities.

VTG 513 Andrology and Artificial Insemination (2 Units; LH 30)

Clinical Examinations. Semen collection, evaluation and preservation. Artificial insemination in different animal species. Instrumentation.

Veterinary Public Health and Preventive Medicine (22 Units)

VPH 201 Animal Welfare (2 Unit; LH 30)

Animal behavior. Animal care in research, transportation. Provisions of the criminal and penal codes on animal handling and welfare.

VPH 402 Biostatistics (2 Units; LH 30)

Measures of central tendency, measures of variability. Population and sample inferences. Test of hypotheses, chi-square tests, normal and other distribution, t-tests, introduction to simple linear regression, sampling methods.

VPH 514 Food and Meat Inspection and Hygiene (2 Units; LH 30)

Meat hygiene, inspection of poultry meat, eggs, milk, fish. Food Preservation: various methods, food spoilage and public health aspects.

VPH 515 Zoonoses and Environmental Health (1 Unit; LH 15)

Ecology, Water sources and purification, waste disposal, public health significance of Rodents, Birds, Flies and Mosquitoes. Environment pollution and control.

VPM 401 Veterinary Extension and Rural Sociology (2 Units; LH 30)

Importance of veterinary extension, rural sociology, extension targets, adoption of extension technologies, components of livestock production and public health extension, extension promotion and delivery.

VPM 502 Epidemiology & Principles of Disease Prevention (2 Units; LH 30)

Definition, scope and uses. Basic concepts of epidemiology, ecology of disease, disease-host-agent-environment. Web of causation. Statistical and Biological significance of epidemiologic associations. Methods of Epidemiologic Investigations. Patterns of disease occurrence. Principles and Procedures for screening diseases. Screening tests and evaluation. Vaccination. Dairy Herd Health. Submission of specimens.

VPM 505 Veterinary Jurisprudence and Ethics (2 Units; LH 30)

Legislation on veterinary practice, the control of animal importation, exportation, animal movements, dogs and public health, meat inspection and hygiene, veterinary drugs, fish and wildlife. Disease Reporting. International, Public health administration.

VPM 506 Veterinary Economics and Business Management (1 Unit; LH 15)

Basic micro and macroeconomics concepts. Cost of public health schemes, Demand and supply of veterinary services. Economic of livestock production. Economics of operating a Veterinary practice and managing a veterinary clinic/ hospital, Benefit-cost analysis. Business organizations administration and promotion. Business management. Project appraisal and feasibility reports.

VPM 608 Computer Application in Veterinary Practice (2 Units; LH 15 PH 45)

History of computers. Hardware components, operating and application software. Features and Uses of word processing packages, Introduction to Spreadsheets, Database Management Systems and designing Computer-based Veterinary disease reporting systems. Introduction to geographic information system (GIS) and its use in biological risk management. Use of Global Positioning System in geo-referencing and estimating pattern of spread of disease. Computer aided animal population census and ecosystem health. Other uses of computers in veterinary practice.

Aquatic and Wildlife Medicine (10 Units)

AVM 301 Fish Husbandry and Management (2 Units; LH 15 PH 45)

Aquatic ecology, types of aquatic animals. Identification of marine and fresh water fishes species. Fishing methods. Aquaculture and management. Construction and management of fish ponds. Feeds and Feeding. Nutritional deficiencies.

AVM 302 Wildlife and Exotic Animal Nursing (3 Units; LH 30 PH 45)

Importance of zoological gardens, layout of zoological garden including zoo clinic and quarantine facilities. Animal species in the zoo. Housing of different animal species. Care of zoo animals. Restrain of different animal species.

AVM 513 Diseases of Aquatic Animals (2 Units; LH 30)

Bacteria, viral, mycotic, parasitic and environmental diseases of fish and other aquatic animals. Nutritional diseases.

AVM 614 Wildlife Ecology and Diseases (3 Units; LH 45)

Ecology of wild animals. Wildlife conservation. Capture techniques. Physical and chemical restrain of wild animals. Care and management of wild animal parks and zoological gardens. Diseases of primates, reptiles and other wild animals.

Clinics, Seminar and Research Projects (45 Units)

VCH 603 Clinics I (15 Units; PH 675)

Clinics I is to be further divided into clinical modules in Medicine, Surgery, Theriogenology, Public Health and Preventive Medicine and Diagnostics. Clinical exercises involving familiarization with methods of clinical manipulations, sample collection from clinical cases, diagnosis and laboratory medicine.

VCH 604 Clinics II

(15 Units; PH 675)

Clinics II is to be further divided into clinical modules in Medicine, Surgery, Theriogenology, Public Health and Preventive Medicine. During the rotations, the students observe and participate in clinical practice.

VCH 605 Clinical Seminar

(1 Unit; PH 45)

A course involving case work-ups and seminar presentation by each student to be coordinated by the Faculty. The course shall be assessed by lecturers in all clinical departments.

VCH 606 Research Project

(4 Units; PH 180)

A project involving a simple research topic in any subject area in the Veterinary Medicine curriculum. Each student shall be allowed to carry out the study in his area of interest as may be moderated by the Faculty and the relevant department.

DRAFT

SECTION FOUR:

ESSENTIAL EQUIPMENT FOR TEACHING, RESEARCH, CLINICAL SERVICES AND AT FACULTY OF VETERINARY MEDICINE

4.1 Preamble

The veterinary programme must be adequately financed, housed, equipped and staffed. For each subject area, basic teaching equipment should be provided in adequate numbers in proportion to the number of students enrolled. The essential equipment and facilities for the veterinary faculty are presented in this section. The departmental laboratories are expected to house those equipment for the specialized areas of the programmes run in the department while centralized laboratories/clinics are to house those facilities that are to be operated centrally for optimal utilization.

4.2 Departmental Based Equipment

4.2.1 Department of Veterinary Anatomy

Student's learning objective in veterinary anatomy is to acquire knowledge of normal body structures, their forms in domestic and non-domestic animals at cellular, gross and developmental levels. The laboratories for these shall preserve whole animal bodies for students' dissection and have sufficient number of microscopes for students to view and study the slides on animal body cells.

A: List of Laboratories/Workshops

- (i) Gross Anatomy Laboratory allowing 1.9m² per student
- (ii) Histology Laboratory allowing 1.9m² per student
- (iii) Histotechnique (Preparation) Laboratory measuring 10m²
- (iv) Transmission Electron Microscopy Laboratory
- (v) Walk-in Cold-Room (20m²)
- (vi) Anatomy Museum-10m²

B: List of Major Equipment/Experiments

- (i) **Gross Anatomy Laboratory:**
 - Post-mortem Table (1 per 5 students)
 - Giant Freezer
 - Refrigerator (large)
 - Storage Tanks -4 m³
 - Knife Sharpener
 - Dissecting sets
 - Weighing Balance
 - Analytical Balance
 - Hot Air Oven
 - Electric Saw
 - X-ray Viewing Machine
 - Digital Camera
- (ii) **Histology Laboratory:**
 - Tissue Processor (automatic)
 - Water Bath
 - Microtome (Rotary)

- Freezing Microtome (Cryostat)
- Paraffin Embedder
- Bench Centrifuge
- Demonstration Microscope
- Binocular Microscope (1 per 2 students)
- Camera-mounted Microscope
- Still Camera with Kit
- PH Meter
- Transmission Electron Microscope

(iv) **Anatomy Museum:**

- Museum Specimen of Animal Species
- Auticulated and Unarticulated Skeletons
- Models
- Embalmed Bodies

4.2.2 **Department of Veterinary Physiology and Biochemistry**

Student's learning objectives in veterinary physiology and biochemistry are to acquire knowledge of normal body functions in domestic and non-domestic animals at the molecular level (biochemistry), cellular and gross (physiology) levels. Laboratories should be able to harvest live animal tissues for study, both qualitative and quantitative assessment with sufficient number of equipment for students to observe, enumerate and experiment with animal body cells, tissues and organs at work and in molecular activity.

A: List of Laboratories/Workshops

- (i) Physiology Laboratory allowing 1.9m² per student
- (ii) Biochemistry Laboratory allowing 1.9m² per student

B: List of Major Equipment/Experiments

(i) **Physiology Laboratory:**

- Physiograph (1 per 10 students)
- Kymograph (1 to 4 students)
- Spectrophotometer
- Analytical Balance
- Top-loading Balance
- Water Distiller
- Water Deionizer
- Autoclave
- Fume Chamber
- Haemoanalyser
- Haemocytometer
- Refrigerated Centrifuge
- Regular Centrifuge
- Refrigerator
- Deep Freezer
- Demonstration Microscope
- Binocular Microscope (1 to 2 students)

- Fluorescent Microscope
- PH Meter
- Soxhelt Extractor
- Rotary Evaporator
- Multimedia Projector

(ii) **Biochemistry Laboratory:**

- Autoclave
- Water Bath
- Bench Centrifuge
- Micro-Centrifuge
- Water Distiller
- PH Meter
- Vacuum Pump
- Spectrophotometer
- Kjehldhal auto analyser
- Fibre Digester
- Ether Extractor
- Gas Chromatography
- Electrophoresis
- Multimedia Projector

4.2.3 **Department of Animal Management and Production**

Student's learning objective in animal management and production is to acquire knowledge of the various breeds, breeding and genetics, feeds, nutrition, housing, restraint and management of companion animals (including dog, cat, donkey and horses) in particular. Horse stables and dog kennels are therefore required to keep some horses and dogs for training of students, and a nutrition laboratory for students to practice the compounding of animal feed.

A. **List of Laboratories/Workshops**

- (i) Animal Nutrition Laboratory allowing 1.9m² per student

B. **List of Major Equipment/Experiments**

(ii) **Animal /Nutrition Laboratory**

- Flame analyser
- Spectrophotometer
- Calorimeter
- Animal cages
- Water Bath
- Kjehldhal auto analyser
- Fibre Digester
- Ether Extractor
- Multimedia Projector
- Deep Freezer
- Refrigerator
- PH meter
- Weighing balance

- Top-loading Balance
- Autoclave
- Fume Chamber
- Large Drying Oven
- Vacuum Oven
- Rotary evaporator
- Flame analyser
- Water bath
- Grinding Machine
- Cold centrifuge
- Furnace
- Spectrophotometer
- Calorimeter
- Air oven
- Infrared spectrophotometer
- Fluoremeter
- Auto sampler
- Atomic Absorption Spectrophotometer
- Specpolus
- Brabender Amylograph
- Brabender Frarinograph
- Gas Chromatography machine
- Water Distiller

4.2.4 Department of Veterinary Pharmacology and Therapeutics

Student's learning objectives in veterinary pharmacology and therapeutics are to acquire knowledge of drugs and their effects on the normal body functions and disease situation in the body. This includes the effect of various therapeutic agents on diseases causing agents and the side effects on animals at molecular, cellular and systemic levels. Laboratories in this department shall prepare live animal tissues for experimentation and response to various active ingredients of drugs, dose-effect response, toxicity reactions, compounding and dispensing of drugs as well as combination and effects of multiple dosing in drugs interaction.

A. List of Laboratories/Workshop

- (i) Pharmacology & Pharmacy Laboratory (allowing 1.9m² per student)
- (ii) Toxicology (allowing 1.9m² per student)
- (iii) Herbarium for Medicinal and Poisonous plants (50 m²)

B. List of Major Equipment/Experiments

- (i) **Pharmacology & Pharmacy Laboratory:**
 - Giant Freezer
 - Refrigerator
 - Regular Centrifuge
 - Refrigerated Centrifuge
 - Haematocrit Centrifuge
 - HPLC
 - Spectrophotometer

- PH Meter
- Colorimeter
- Soxhelt Extractor
- Fume Chamber
- Analytical Balance
- Top-loading Balance
- Water Distiller
- Rotary Evaporator
- Autoclave
- Tissue Bath
- Fume Chamber
- Freeze Dryer

(ii) **Toxicology Laboratory:**

- Tissue Processor (automatic)
- Water Bath
- Water Distiller
- PH Meter
- Colorimeter
- Microtome
- Freezing Microtome (Cryostat)
- Bench Centrifuge
- Demonstration Microscope
- Binocular Microscope (1 per 2 students)
- Camera-mounted Microscope
- Still Camera with Kit

4.2.5 **Department of Veterinary Microbiology**

Students' learning objective in veterinary microbiology is to acquire knowledge in the various pathogens (bacteria, fungi and viruses) that are of veterinary importance locally, nationally and globally. The laboratories in the department should be capable of preparing students to culture, identify and possibly characterize them, with a view to understand how they cause disease in man and animals.

A. **List of Laboratories/Workshop**

- (i) Microbiology Laboratory 1.9m² per student & Media Preparation Room-30 m²
- (ii) Virology Laboratory 1.9m² per student

B. **List of Major Equipment/Experiments**

(i) **Microbiology Laboratory:**

- Demonstration Microscope
- Binocular Microscope (1 to each Student)
- Phase Microscope
- Fluorescent Microscope
- Photo-Microscope
- Refrigerator
- Giant Freezer
- REFCO Freezer
- Weighing Balance

- Top-Loading Balance
- Analytical Balance (Metler-type)
- PH Meter
- ELISA Machine
- Colony Counter
- Hot Air Oven
- Autoclave
- Water Bath
- Multimedia Projector
- Digital Camera

(ii) **Virology Laboratory:**

- Egg Incubator
- PCR Machine
- Water Bath
- Giant Freezer (-80°C)
- Humidifier
- Fume Chamber
- Bench Centrifuge

4.2.6 **Department of Veterinary Parasitology and Entomology**

Student's learning objective in veterinary parasitology and entomology is to acquire knowledge in the various protozoans, helminthes and arthropods that are of veterinary importance nationally and globally. The laboratories in the department should be capable of preparing students to identify, characterize and possibly breed and propagate them in-house, with a view to understanding how they cause disease in man and animals.

A. **List of Laboratories/Workshops**

- (i) Parasitology Laboratory allowing 1.9m² per student
- (ii) Preparation Room-30 m²

B. **List of Major Equipment/Experiments**

(i) **Parasitology Laboratory:**

- Giant Freezer
- Demonstration Microscope
- Dissecting Microscope (1 per 5 students)
- Binocular Microscope (1 per 2 students)
- Fluorescent Microscope
- Thermohygraph
- Humidifier
- Incubator
- Centrifuge (Bench-type)
- Hand Centrifuge
- Top-loading Balance
- Autoclave
- Liquid Nitrogen
- Multimedia Projector
- Digital Camera

4.2.7 Department of Veterinary Pathology

Student's learning objective in veterinary pathology is to acquire knowledge of diseases in animal body. The clear understanding of cellular, molecular and functional bases of disease in domestic and non-domestic animals shall be acquired, to the point of appreciating the individual clinical manifestation of diseases. The laboratories shall prepare animal tissues that have lesions at cellular and gross levels for students to study microscopically and on whole animal body at post-mortem.

A: List of Laboratories/Workshops

- (i) Necropsy Room/Laboratory (100m²)
- (ii) Histopathology Laboratory allowing 1.9m² per student
- (iii) Clinical Pathology Laboratory allowing 1.9m² per student
- (iv) Cold-Room (50m²)

B: List of Major Equipment/Experiments

- (i) **Necropsy Room/Laboratory:**
 - Necropsy Table (1 per 5 students)
 - Giant Freezer
 - Refrigerator
 - Electric Rotary Saw
 - Knife Sharpener
 - Electric Saw
 - Digital Camera
 - Incinerator-4m²
- (ii) **Histopathology Laboratory:**
 - Tissue Processor (automatic)
 - Water Bath
 - Paraffin Embedder
 - Microtome
 - Haemalyzer
 - Haemocytometer
 - Water Distiller
 - PH Meter
 - Freezing Microtome (Cryostat)
 - Bench Centrifuge
 - Demonstration Microscope
 - Binocular Microscope (1 per 2 students)
 - Camera-mounted Microscope
 - Still Camera with Kit
 - Multimedia Projector
- (iii) **Clinical Pathology Laboratory:**
 - Autoclave
 - Haemoanalyser
 - Haemocytometer
 - Fluorescent Microscope
 - Spectrophotometer
 - Bench Centrifuge
 - Micro-Centrifuge

- Water Distiller
- PH Meter
- ELISA Equipment
- Liquid Nitrogen
- REVCO Freezer

4.2.8 Department of Veterinary Medicine

Student's learning objectives in veterinary medicine are to acquire knowledge of diagnostics and to prepare students for ability to use problem-solving skills to analyze a patient, synthesize a diagnosis or differential diagnosis, appropriate use of clinical laboratory testing and medicine skills for case management, offer emergency and intensive care for a wide range of animal species. Clinics in this department shall preferably be specific for each or each group of domestic animal species.

A: List of Laboratories/Workshops

- (i) Large Animal Demonstration Hall-100m²
- (ii) Small Animal Demonstration Hall-100m²

B: List of Major Equipment/Experiments

- Refrigerator
- Freezer
- Battery Cages
- Crush
- Weigh-bridge Scale
- Thermometer
- Wall mounted drug box
- ENT Set
- Tanometer
- Woods Lamb (UV-light)
- Haemalyser

4.2.9 Department of Veterinary Surgery

Student's learning objectives in veterinary surgery shall be to prepare students for ability to use problem solving skills to analyze a patient, synthesize a diagnosis or differential diagnosis, appropriate use of basic surgery skills for case management, relieve of pain and intensive care for a wide range of animal species.

A: List of Laboratories/Workshops

- (i) Demonstration Surgical Theatre (100m²)
- (ii) One Exercise Yard (fenced) (50m²)
- (iii) Recovery (Hospitalization) Ward

B: List of Major Equipment/Experiments

- (i) **Demonstration Surgical Theatre:**
 - General Surgical Packs (8)
 - Orthopaedic General Packs
 - Ophthalmic Surgical Packs
 - Gastro Intestinal Packs

- Jacobs Chuck
- Intra medullary Pins (various Sizes)
- Cerclage Wire (4 rolls)
- ASIF kit (2 sets)
- Screws (Cortical and Cancellous) various sizes (24 each)
- Endoscope
- Arthroscope
- Derma Drill
- Power Drills – Saw, Drill and Drill bits (1 set each)
- P. O. P. Removal (Manual) (2)
- P. O. P. Removal (Powered) (2)
- X-Ray Viewers - 3 Units Set
- X-Ray Viewer
- X-Ray Dryer (2)
- Dark Room Facility
- High Resolution Camera and Flash (35mm)
- Multimedia Projector
- Auto Clave
- Computer

4.2.10 Department of Veterinary Theriogenology

Student's learning objectives in veterinary reproduction are to acquire knowledge of normal reproductive functions in domestic and non-domestic animals at hormonal, cellular and systemic levels. Students learn about diseases affecting reproduction in male and female animals and the process of delivery of newborn. Clinics and laboratory in this department cover all aspects of examination and therapy, including surgical obstetrics for various animal species.

A: List of Laboratories/Workshops

- (i) Reproduction Laboratory (100m²)
- (ii) Phantom Training Laboratory (100m²)
- (iii) Incinerator

B: List of Major Equipment/Experiments

- (i) **Reproduction Laboratory:**
 - Autoclave
 - Giant Freezer
 - Refrigerator
 - Bench Centrifuge
 - Nitrogen Flask
 - PH Meter
 - Water Distiller
 - Incubator
 - Water Bath
 - Top-Loading Balance
 - Analytical Balance
 - Binocular Microscope (1 per 2 students)
 - Demonstration Microscope
 - Phase Microscope
 - Calorimeter

- Digital Camera
- Camera-mounted Microscope
- (ii) **Phantom Training Laboratory:**
 - Electro ejaculator
 - AI Equipment (Inseminator)
 - Artificial Vaginal
 - Dummy
 - Obstetrical Equipment
 - OB Cloves
 - Vaginal Speculum (Large Animals)
 - Vaginal Speculum (Small Animals)
 - Tissue Processor (automatic)
 - Water Bath
 - Microtome
 - Freezing Microtome (Cryostat)
 - Digital Camera

4.2.11 Department of Veterinary Public Health and Preventive Medicine

Student's learning objectives in veterinary public health and preventive medicine is to prepare students for ability to use problem-solving skills to analyze a herd of animals, synthesize a diagnosis or differential diagnosis about their state, appropriate use of clinical laboratory testing and offer ability to identify ways to prevent diseases, identify organisms that require biosecurity measures, identify zoonotic disease and food safety issues and to promote awareness of the public and animal health. Another objective is that students are trained in the monitoring and evaluation of disease control projects.

A: **List of Laboratories/Workshops**

- (i) Public Health and Food Safety Laboratory allowing 1.9m² per student
- (ii) Bacterial Zoonoses Laboratory
- (iii) Epidemiology Laboratory
- (iv) Walk-in Cold-Room
- (v) Computer Laboratory

B: **List of Major Equipment/Experiments**

- (i) **Public Health and Food Safety Laboratory:**
 - Giant Freezer
 - Refrigerator
 - Meat Inspection Kit (1 per 5 Students)
 - Knife Sharpener
 - Hot Air Oven
 - Fume Chamber
 - PH Meter
 - Weighing Balance
 - Incubator
 - HPLC
 - Digital Camera
 - Colony Counter
 - Water Distiller
 - Water bath

- Tissue Blender
- Automatic Multiple Pipette
- ELISA Kit
- Binocular Microscope
- Demonstration Microscope
- Grinding Machine
- Freeze Dryer
- Tissue Culture Chamber
- Multimedia Projector

(ii) **Epidemiology Laboratory:**

- Global Positioning System Instrument (Motorola)
- Compasses
- Ambulatory Vehicle (Four-wheel drive)
- Water Bath
- Dog catcher
- Snake tong
- Snake hook
- Pole syringe
- Umbrellas
- Camp beds (10)
- Bench Centrifuge
- Demonstration Microscope
- Binocular Microscope (1 per 2 students)
- Camera-mounted Microscope
- Still Camera with Kit

(iii) **Computer Laboratory:**

Students of Veterinary Medicine are to be exposed to computing in all its facets so that they can utilize the expertise in the practical and analytical aspects of their training. The computer laboratory should be adequately equipped to ensure reasonable contact hours by students. Most importantly the laboratory is expected to install software packages such as Epiinfo for epidemiological studies.

- Desktop Computers (20 Nos)
- Flatbed Scanners
- Software Packages for Epidemiological studies such as Epi-info, data analysis, Digital mapping.
- Printers (4 Nos)
- Internet Modem

4.2.12 **Department of Aquatic and Wildlife Medicine**

Student's learning objectives in wildlife and fish medicine are to acquire knowledge of diagnostics and to prepare students for ability to use problem-solving skills to analyze a patient, synthesize a diagnosis or differential diagnosis, appropriate use of clinical laboratory testing and medicine skills for case management, offer emergency and intensive care for a wide range of wild animal species. Clinics in this department shall preferably be specific for wild animal and fish species, including those of small and large animals as well as fish.

A: List of Laboratories/Workshops

- (i) Fish Diseases Investigation Laboratory
- (ii) Wildlife Management Laboratory
- (iii) Demonstration Fish Pond

B: List of Major Equipment/Experiments

(i) Fish Diseases Investigation Laboratory:

- Deep freezer
- Refrigerator
- Metler balance
- Autoclave
- Camera-mounted microscope
- Dissolved Oxygen Meter
- Haemoanalyser
- TDS/Electrical Conductivity/Salinity Meter
- Dissecting sets
- Stainless Steel trays for dissection (1 per 5students)
- Multimedia Projector
- Projector screen

(ii) Wildlife Management Laboratory:

- Snake tongs (1 per 5students)
- Snake hooks (1 per 5students)
- Squeeze cages (1 per 5students)
- Dog catcher
- Crates
- Digital Camera
- Pole Syringes
- Dart Pistol
- Dart Rifle
- Deep freezer
- Weigh-bridge Scale
- GPS Instrument

(iii) Demonstration Fish Pond:

Centralised Facilities

4.2.13 Veterinary Teaching Hospital

To enhance clinical training at undergraduate and postgraduate levels, a VTH provides enhanced specialized facilities for effective teaching of clinical students as they attempt to synthesize and practicalise all the information received over the earlier years of the programme on the practice of animal disease management. A core of experts who carry out ambulatory and extension services to the contiguous communities and beyond is present in the hospital. The VTH may also serve as a locus for continuing education programmes that may involve farmers and veterinary practitioners. The Federal Ministry of Agriculture and Water Resources in collaboration with the NUC oversees the VTH.

A: Clinics and Workshops

- (i) Small Animal Operating Theatre-100m²
- (ii) Large Animal Operating Theatre-100m²
- (iii) Small Animal Clinic - 200m²
- (iv) Poultry Clinic-50m²
- (v) Preventive Medicine Clinic-50m²
- (vi) Diagnostic Laboratories
- (vii) Small Animal Hospital Wards – 100m².
- (viii) Large Animal Hospital Wards – 100m².
- (ix) Isolation Unit - 50m².
- (x) Radiography Unit
- (xi) Reception and Records-15m²
- (xii) Pharmacy-9m²

B: Staff

- Director
- Interns/Residents (10)
- Secretary
- Veterinary Nurses/Animal Health Superintendents (15)
- Radiographers (3)
- Livestock Attendants (10)
- Drivers
- Messengers/Cleaners
- Dispensers (2)

C: List of Major Equipment/Experiments

- Large Animal Anaesthetic Machine
- Small Animal Anaesthetic Machine
- X-Ray Machine Fixed (2)
- Mobile X-ray machine (2)
- X-Ray Reading Facility (3)
- Ultrasound Equipment
- Autoclave
- Steam Sterilizer (2)
- Surgical Table Small Animal (6)
- Large Animal Surgical Table (2)
- Surgical Lamps (10)
- Freezer
- Refrigerator
- Ambulatory Van-Minibus
- Vehicle (Pick-Up Van)
- Video/CD Recorder
- Video/CD Player
- Multimedia Projector
- Computer (4)

4.2.14 **Veterinary Teaching Farm**

Each Faculty of Veterinary Medicine should have a Veterinary Teaching Farm with varieties of livestock for teaching and research by both staff and students.

A: Space and Buildings

- Poultry Houses- 1000m²
- Porcine House-1000m²
- Caprine House-1000m²
- Fish ponds (2)

B: Staff

- Chairman
- Animal Attendants (6)

4.2.15 **Experimental Animal Unit**

Each Faculty of Veterinary Medicine should have an Experimental Animal Unit for keeping laboratory animals (rats, guinea pigs and rabbits) for teaching and research by both staff and students.

A: Space and Buildings

- Rabbitry-1000m²
- House for Rats

B: Staff

- Chairman
- Animal Attendants (6)

4.2.16 **Veterinary Field Station**

Each Faculty of Veterinary Medicine should have an associated Veterinary Field Station that will be located in a suitable rural agricultural district to service contiguous States and will be distinct from the Veterinary Teaching Hospital which is located within the University. The Veterinary Field Station is intended to provide instructional facilities for students on farm management, disease surveillance and control and clinical research. It:

- i. Provides a base for ambulatory clinics and extension services of the Veterinary Teaching Hospital;
- ii. Serves as a means of exposing veterinary students to rural veterinary practice;
- iii. Provides opportunities for commercial livestock production and entrepreneurship;
- iv. Provides an opportunity for breeding and management related research aimed at boosting livestock production and improved animal health delivery system.

A: Space and Buildings

- At least 10 hectares of land for paddocks and arable cropping
- Fish ponds (2)
- Poultry Houses (3)
- Cattle Shed (2)
- Sheep and Goats Units
- Rabbitry

- Feed Mill
- Administrative Offices
- Veterinary Clinic
- Diagnostic Laboratory
- Students Hostel (for 20 Students)

B: Staff

- Manager
- Veterinary Clinicians (3)
- Veterinary Nurses/Animal Health Superintendents (4)
- Workshop Superintendent
- Motor Mechanics
- Motor Drivers
- Tractor Driver
- Animal Attendants
- Hostel Superintendent
- Cleaners
- Typist

C: List of Major Equipment/Experiments

- Crush (2)
- Weighbridge (1)
- Refrigerator (2)
- Spray-race Machine (1)
- Battery Cages for 500 birds
- Vehicle (Station Wagon and Truck) (2)

4.2.17 Zoological Garden

Each Faculty of Veterinary Medicine should have an associated zoological garden to which students should have free access for the purposes of teaching clinical veterinary practice in wildlife medicine. The garden should be equipped with varieties of wild animals.